Office of Finance & Accounting Policy

OFFICE OF FINANCE AND ACCOUNTING POLICY

1. Document entitled "Status of Enron Contracts with Bonneville Power Administration," dated March 5, 2002. 1 page. (F2001-00630)

2. Undated draft letter to Terence Thorn, Senior Vice President, Enron, from Philip R. Pegnato.. 2 pages. (F2001-00630)

3. Undated draft News Release entitled "Abraham Instructs Energy Department to Monitor Electricity Markets in Light of Enron Bankruptcy." 1 page. (F2001-00630

4. Undated draft document entitled "SA Enron op-ed Draft." 2 pages. (F2001-00630)

5. Undated draft document entitled "SA Enron op-ed Draft." 2 pages. (F2001-00630)

6. Undated and untitled document that contains view graphs about Natural Gas Industry. 11 pages. (F2001-00630)

7. Memorandum to Beth Arner, Executive Assistant, and Dawn Schrepel, Trip Coordinator, from Marilyn Dillon, Administrative and Human Resources Management Staff, Human Resources and Administration, dated December 8, 1994. Subject: Outstanding Payments for Chartered Aircraft to Pakistan. 1 page. (F2002-00630)

8. Document entitled "DOE billing/collection & payment status at," dated August 11, 1995.. 2 pages. (F2001-00630)

9. Memorandum to Marilyn Dillon from Donna Sweeney, Accounts Receivable Section, dated January 31, 1995. Subject: Regarding Pakistan Trips. 2 pages.

10. Undated document entitled "Payer Report." 2 pages. (F2001-00630)

11. Document entitled "Partial list of U.S. DOE India Business Delegation List." 1 page. (F2001-00630)

12. Undated draft letter to Senior Vice President, Enron, from Philip R, Pegnato, Accounting Division. 1 page. (F2001-00630)

13. Facsimile cover sheet to Mary Rosicky from Wendy L. Miller, dated July 12, 2002. 1 page. (F2001-00630)

14. Undated and untitled list with company names and addresses. 10 pages. (F2001-00630)

15. Document entitled "Trip Report, Presidential Mission on Energy Investment to Pakistan Led by Secretary of Energy Hazel R. O'Leary," dated September 21-24, 1994. 3 pages (F2001-00630)

16. Undated document entitled "Trip Report, Presidential Mission on Energy Investment to Pakistan, Led by Secretary of Energy Hazel O' Leary, September 21-24, 1994." 3 pages. (F2001-00630)

17. Undated document entitled "Trip Report, Presidential Mission on Sustainable Energy and Trade to India, Led by Secretary of Energy Hazel R. O'Leary, July 7-15, 1994." 20 pages with eight enclosures. (F2001-00630)

    A. Undated document entitled "Official Documents Signed on Mission." 1 page. (F2001-00630)

    B. Undated document entitled "Record of Meeting on Sustainable Production of Power of India." 2 pages. (F2001-00630)

    C. Undated document "Non-Conventional Energy Sources and the US Delegation Led by the Secretary of Energy." 7 pages. (F2001-00630)

    D. Undated document entitled "Record of Meeting on Sustainable Development on India's Coal Resources." 5 pages. (F2001-00630)

    E. Undated document entitled "Memorandum of Understanding Between The Government of the United States of America (Department of Energy and the Government of India (Ministry of Power) Preamble." 6 pages. (F2001-00630)

    F. Undated document entitled "Joint Statement of Intent Between the Department of Energy of the United States of America and the Ministry of Non-Conventional Energy Sources of the Republic of India." 6 pages. (F2001-00630)

    G. Undated document entitled "Joint Statement of Intent Between the Ministry of Environment and Forests of the Republic of India and the Department of Energy of the United States of America to Cooperate in Environment Enhancing Energy Technologies." 5 pages. (F2001-00630)

    H. Undated document entitled "Joint Statement of Intent Between The Department of Energy of the United States of America and The Ministry of Power of the Republic of India To Cooperate in the Field of Energy Efficiency." 3 pages. (F2001-00630)

    I. Undated document entitled "Protocol of Intent Between The United States Department of Energy and the United States Agency for International Development and The Ministry of Power of the Government of India and the National Thermal Power Corporation Limited, India." 1 page. (F2001-00630)

    J. Undated document entitled "Appendix 2. Session Summary: Indo/U.S. Partnership for the Future." 3 pages. (F2001-00630)

K. Document entitled "Appendix 3. US DOE India Business/Government Delegation List." 5 pages. (F2001-00630)

L. Document entitled "Appendix 4, dated Thursday, July 7, 1994." 10 pages. (F2001-00630)

M. Undated document entitled "DOE Delegation Members Secretary O'Leary's India Trip–July 1994." Information withheld under Exemption B2. 4 pages. (F2001-00630)

18. Undated document entitled "Trip Report, Presidential Mission on Sustainable Energy and Trade to China, Led by Secretary of Energy Hazel R. O'Leary, February 15-24, 1995." 10 pages with sixteen enclosures. (F2001-00630)

A. Undated document entitled "Renewables: Private Sector Agreements." 2 pages. (F2001-00630)

B. Undated document entitled "Energy Efficiency." 2 pages. (F2001-00630)

C. Undated document entitled "Energy Efficiency: Private Sector Agreements." 1 page. (F2001-00630)

D. Undated document entitled "Finance." 4 pages. (F2001-00630)

E. Undated document entitled "Electricity." 2 pages. (F2001-00630)

F. Undated document entitled "Electricity: Private Sector Agreements." 2 pages. (F2001-00630)

G. Undated document entitled "Environment." 4 pages. (F2001-00630)

H. Undated document entitled "Environment Private Sector Agreements." 1 page. (F2001-00630)

I. Undated document entitled "Clean Coal Technology." 3 pages. (F2001-00630)

J. Undated document entitled "Coal: Private Sector Agreements." 1 page. (F2001-00630)

K. Undated document entitled "Oil and Natural Gas." 3 pages. (F2001-00630)

L. Undated document entitled "Oil and Gas: Private Sector Agreements." 1 page. (F2001-00630)

M. Undated document entitled "Nuclear Power." 4 pages. (F2001-00630)

N. Undated document entitled "Presidential Mission on Sustainable Energy and Trade to China Led by the Honorable Hazel R. O'Leary, Secretary of Energy. Final Delegation Agenda." 4 pages. (F2001-00630)

O. Undated document entitled "Presidential Mission on Sustainable Energy and Trade to China Led by the Honorable Hazel R. O'Leary, Secretary of Energy. Final Secretarial Agenda." 3 pages. (F2001-00630)

P. Undated document entitled "Presidential Mission on Sustainable Energy and Trade to China. Official Delegation." 12 pages. (F2001-00630)

19. Undated document entitled "Trip Report, Clinton Administration Delegation on Sustainable Energy & Empowerment to South Africa -- August 20-27, 1995." 5 pages with . (F2001-00630)

A. Undated document entitled "South Africa Commitment Matrix. All outcomes except the Non-proliferation conference are within the Binational Commission." 9 pages. (F2001-00630)

B. Undated document entitled "Master Schedule." 10 pages. (F2001-00630_

C. Undated document entitled "Clinton Administration Delegation on Sustainable Energy and Empowerment to South Africa . Official Delegation." 10 pages. (F2001-00630)

D. Undated document entitled "Terms of Reference of The Sustainable Energy Development Committee on the United States-South Africa Binational Commission." 3 pages. (F2001-00630)

E. Undated document entitled "Joint Statement of Intent Between the Department of Energy of the United States of America and The Department of Mineral and Energy Affairs of the Republic of South Africa on an Energy Information Exchange." 3 pages. (F2001-00630)

F. Undated document entitled "Joint Statement of Intent Between the Department of Energy of the United States of America and The Department of Mineral and Energy Affairs of the Republic of South Africa on Energy Policy, Science and Technology, and Development." 2 pages. (F2001-00630)

G. Undated document entitled "South Africa Signings Announcement and Initiatives Government-to-Government Agreements." 3 pages. (F2001-00630)

H. Undated document entitled "South Africa Signings, Announcements and Initiatives. Education and Empowerment." 5 pages. (F2001-00630)

I. Undated document entitled "South Africa Signings, Announcements and Initiative. Policy Development and Investment." 7 pages. (F2001-00630)

J. Undated document entitled "POD Reports." 4 pages. (F2001-00630)

K. Undated document entitled "Electricity." 3 pages. (F2001-00630)

L. Undated document entitled "Energy Efficiency." 3 pages. (F2001-00630)

M. Undated document entitled "Finance." 3 pages. (F2001-00630)

N. Undated document entitled "Oil and Gas." 4 pages. (F2001-00630)

O. Undated document entitled "Renewables." 3 pages. (F2001-006630)

P. Undated document entitled "Research and Development." 3 pages. (F2001-00630)

Q. Undated document entitled "U.S. Ambassador's Summary." 1 page. (F2001-00630)

R. News articles from the Washington Post entitled "U.S. to Help S. Africa Boost Energy, Create Jobs." 2 pages. (F2001-00630)

20. Undated document entitled "Trip Report, U.S. Department of Energy, Led by Deputy Secretary William H. White, June 19-22, 1995, Mission to Mexico, Trip Report." 66 pages. (2001-00630)

5:00pm, 3/5/02
From a list by
Michael Kidwell

REP. VISCLOSKY

STATUS OF ENRON CONTRACTS WITH BONNEVILLE POWER ADMINISTRATION

During the 2001-2006 period, BPA is contractually obligated to serve about 11,000 average megawatts (aMW) of loads. BPA has only about 8,000 aMW of firm generating resources. BPA has contracted to purchase about 275 aMW of energy from Enron over the next five year period as part of its augmentation strategy. This is a relatively small part of BPA's augmentation portfolio, which is highly diversified. The cost of these purchases is reflected in BPA's current wholesale power rates.

Though the contracts are, on average, at prices above today's market, BPA would be unwilling to abrogate them because these purchase agreements are under the Western Systems Power Pool contract which generally requires payment of the full portfolio value of the contract at the time of termination. However, if Enron fails to deliver power under these contracts, BPA would benefit financially.

BPA has terminated two long term sales contracts with Enron of about 200 aMW. These contracts had specific language allowing termination if either party became insolvent. Termination of these contracts is financially beneficial to BPA.

ENRON
ATTN: Senior Vice President, Terence Thorn
P.O. Box 1188
1400 Smith Street
Houston, TX 77251

Dear Mr. Thorn:

In September 1994, you or a representative of your company traveled to Pakistan and participated in the Presidential mission on energy investment. In the spirit of partnership, there were commitments made by all participants to share in the cost of the travel and related expenses. While other participants have made full payment to settle their commitments, our records show that your account is still open.

We request that you make a check payable to the U.S. Department of Energy (DOE) in the amount of $3,238.50 and reference Pakistan trip. Please send the check expeditiously to the address provided below. Do not send payment to Boise, Idaho as instructed previously by the Office of Secretary.

U.S. Department of Energy
Office of Headquarters Accounting Operations
P.O. Box 500
Germantown, MD 20875-0500

To ensure the travel to Pakistan is free of any adverse criticism, the DOE is very anxious to achieve a full settlement as soon as possible. We request your full cooperation in this matter. If payment is not forth coming soon, please provide us information as to why a settlement cannot be achieved.

If there are any question, please call me at 301-903-4934 or Sandy Isemann at 301-903-5335.

Sincerely,

Philip R. Pegnato

2

Accounting Division

NEWS MEDIA CONTACT:
Jill Schroeder 202/586-4940

FOR IMMEDIATE RELEASE
December XX, 2001

Abraham Instructs Energy Department to Monitor Electricity Markets in Light of Enron Bankruptcy

WASHNGTON, D.C.— In response to the bankruptcy filing by Enron Corporation on Sunday, December 2, Secretary Abraham has instructed the Department of Energy to monitor electricity markets and assess the potential impacts that the filing may have on consumers.

"The Department of Energy remains committed to an open and transparent marketplace and ensuring reliable, affordable electricity to American consumers," said Secretary Abraham. "Enron's bankruptcy was not caused by the structure of our electricity markets and it is in fact reassuring to see that those markets have reacted in a calm and orderly manner to the events of the last month."

"The Department will closely monitor this situation and the potential affects that the bankruptcy filing by Enron will have on the American consumer."

-DOE-

R-01-XXX

SA Enron op-ed
Draft

The fall of Texas-based Enron – as recently as a year ago the nation's 7th largest company – may very well go down in the annals of business history as the most spectacular corporate collapse ever seen. And as with the rise or fall of any commercial behemoth, there are invariably lessons to be learned. Unfortunately it looks as if the first lessons being drawn from the precipitous collapse of Enron are ones we would do best to avoid.

A host of knee-jerk commentators and political activists are using the Enron downfall to campaign against one of the left's most reliable bogeymen: deregulation.

The Boston Globe pointed to "a diminishing faith in markets." A Miami Herald headline read "Energy Deregulation Loses Steam." An outfit called the Foundation for Taxpayer and Consumer Rights cited the Enron debacle evidence of deregulation's evils. Big-government politicians in Washington and in state capitals are saying this proves government must control energy industries.

There's just one problem with this approach: It's wrong. What's clear as the dust begins to settle is that Enron's fall had nothing to do with how California's or the nation's electricity markets are or aren't regulated.

In the mid-1990s Enron grew to prominence as a company that traded various energies as commodities. More recently, it expanded into a conglomerate that dealt in a host of different industries, energy being just one. It ran paper mills and was the seventh largest supplier of newsprint in North America. It pioneered telecommunications bandwidth trading. It manufactured plastics and glass. It handled real estate, directed Internet services, and even sold insurance. Enron was still a large player in the energy industry, but it was becoming less and less an energy company everyday.

Still, because of its size Enron was a tempting target for California politicians who wanted to deflect attention from their disastrous attempts at what some called deregulation. What really happened was a perverse system of regulation where one part of the market was freed, but not the other.

In a nutshell, California set strict controls on retail prices – that is, they capped the prices which utilities could charge consumers (read, voters). They did not cap the prices utilities had to pay from wholesalers. And as the demand for electricity grew, those prices went up. Here's the kicker: California mandated that the utilities buy as much electricity as the public wanted.

As could be predicted, Californians gorged themselves on cheap electricity, the utilities were forced to the point of bankruptcy, and we found ourselves in the middle of an

energy crisis threatening large parts of the country. And the politicians who brought us that mess blamed deregulation.

An analogy might help. Consider the market as a captive, unfairly imprisoned. What California did is like unshackling one leg but not the other, and when no progress is made, saying, "See, freedom doesn't work."
Blasting the straw man of deregulation is merely a smokescreen for saying that the government should be in control of the major decisions about energy production and consumption. Most notably this means that the government should set price controls.

But price controls have never worked. We tried them on oil and gas in the 1970s. They were an utter failure. They led to shortages and rationing and the idea that America was gripped by malaise. Further price controls on electricity will only lead to misery and blackouts while doing nothing to address the steps that must be taken to create a competitive market for electricity in this country.

So what did happen to Enron? There is plenty of evidence to suggest that corporate overreaching and questionable accounting practices played the largest part in the fall of Enron. There appears to be no connection, however, to the California electricity situation.

Whether anything improper or illegal occurred is a matter for the securities regulators and the relevant congressional committees. My concern as Energy Secretary is with the impact on energy markets, and the need for stable markets.

To that end, it is important to repeat this Administration's commitment to pursuing thriving and stable markets with a minimum of government direction. One of the crucial initiatives promoted by the president's National Energy Policy is broad electricity restructuring according to free-market principles.

We are working closely with the House and the Senate, as well as with the various state governments, to do this in a bipartisan fashion. But we shouldn't let those with an ideological beef against free markets distort the news in an effort to derail this much needed reform.

752 words

SA Enron op-ed
Draft

The fall of Texas-based Enron – as recently as a year ago it ranked 7th on the Fortune 500 list – may very well go down in the annals of business history as the most spectacular corporate collapse ever seen. And as with the rise or fall of any commercial giant (they might think behemoth too much), there are invariably lessons to be learned. Unfortunately it looks as if the first lessons being drawn from the precipitous collapse of Enron are ones we would do best to avoid.

A host of commentators are using the Enron downfall as the failed test case for deregulation of the energy market. According to this logic, Enron was one of the major companies involved in supplying power in California, California was mired in an shortage

A crisis which was said to involved dergegulating the stats's

Voila! Deregulation failed

The Boston Globe pointed to "a diminishing faith in markets." (just need to explain that quote more it sort of hangs out there) A Miami Herald headline read "Energy Deregulation Loses Steam." The Foundation for Taxpayer and Consumer Rights cited the Enron debacle as evidence not just of deregulation's failure but its evils. Said a spokesman, "Enron's bakruptcy … shows that our energy system needs adult supervision."

There's just one problem with this approach: It's entirely wrong. What's clear as the dust begins to settle is that Enron's fall had nothing to do with how the nation's or California's(since CA hasn't been mentioned at this point it will need to be explained) electricity markets are or aren't regulated.

Let's look at the facts. In the mid-1990s Enron grew to prominence as a company that traded various types of energas commodities. Natural gas, electricity, even nuclear energy can be traded just like you bonds. (maybe an example like this gets us in trouble?)More recently, it expanded into a conglomerate that dealt in a host of different industries, energy being just one. It ran paper mills and was the seventh largest supplier of newsprint in North America. It pioneered telecommunications bandwidth trading. It manufactured plastics and glass. It handled real estate, directed Internet services, and even sold insurance. Enron was still a large player in the energy industry, but it was becoming less and less an energy company everyday.

Still, because of its size Enron was a tempting target for California politicians who wanted to deflect attention from their disastrous attempts at what some called deregulation. What really happened was a perverse system of regulation where one part

of the market was freed, but not the other.

In a nutshell, California set strict controls on retail prices – that is, they capped the prices which utilities could charge consumers (read, voters). They did not cap the prices utilities had to pay from wholesalers. And as the demand for electricity grew, those prices went up. Here's the kicker: California mandated that the utilities buy as much electricity as the public wanted.

As could be predicted, Californians gorged themselves on cheap electricity, the utilities were forced to the point of bankruptcy, and we found ourselves in the middle of an energy crisis threatening large parts of the country. And the politicians who brought us that mess blamed deregulation.

An analogy might help. Consider the market as a captive, unfairly imprisoned. What California did is like unshackling one leg but not the other, and when no progress is made, saying, "See, freedom doesn't work."
Blasting the straw man of deregulation is merely a smokescreen for saying that the government should be in control of the major decisions about energy production and consumption. Most notably this means that the government should set price controls.

But price controls have never worked. We tried them on oil and gas in the 1970s. They were an utter failure. They led to shortages and rationing and the idea that America was gripped by malaise. Further price controls on electricity will only lead to misery and blackouts while doing nothing to address the steps that must be taken to create a competitive market for electricity in this country.

So what did happen to Enron? There is plenty of evidence to suggest that corporate overreaching and questionable accounting practices played the largest part in the fall of Enron. There appears to be no connection, however, to the California electricity situation.

Whether anything improper or illegal occurred is a matter for the securities regulators and the relevant congressional committees. My concern as Energy Secretary is with the impact on energy markets, and the need for stable markets.

To that end, it is important to repeat this Administration's commitment to pursuing thriving and stable markets with a minimum of government direction. One of the crucial initiatives promoted by the president's National Energy Policy is broad electricity restructuring according to free-market principles.

We are working closely with the House and the Senate, as well as with the various state governments, to do this in a bipartisan fashion. But we shouldn't let those with an ideological beef against free markets distort the news in an effort to derail this much needed reform.

752 words

Energy Assurance Conference
Natural Gas Industry

12/12-13/2001
Washington, DC

What Is Natural Gas?

- Hydrocarbon Fuel
- Gas, not a liquid
- Primarily methane, (hydrogen and carbon)
- Lighter than air
- Relatively tight fuel air ratio for ignition
- Relatively high ignition temperature
- Delivered only through pipelines

What Can Go Wrong?

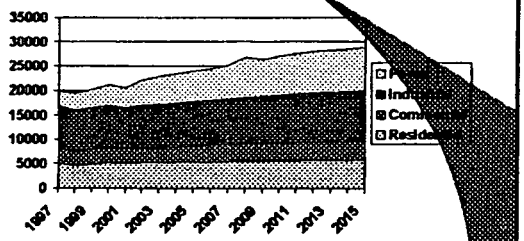
- Ignition of the gas outside of the pipeline
  - Localized
  - Predictable
  - Short Term
- Non-delivery of the product
  - Regional
  - Shutdown
  - Startup
- Over-delivery of the product
  - Localized

6

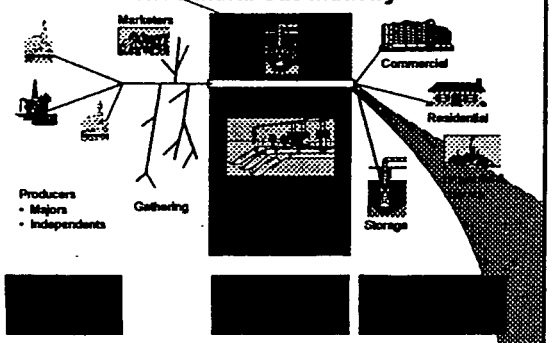
Why is natural gas important?

- 25% of the Energy Consumed in the US
- 36" Pipeline Delivers 9,260 ft^3/sec
  - Heat Average Midwest Home 21 Days
  - Hot Water for 475 Showers
  - 1.65 Tons of Steel in Blast Furnace
  - Generate Electric Power foe Home for 4[illegible] Days
  - Feedstock for Fertilizer to Produce 285 Bushels of Wheat

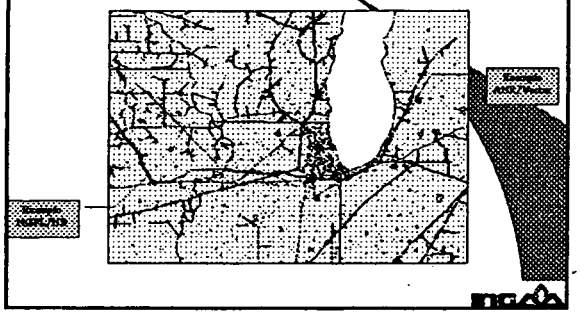
Selected Gas Consumption (Bcf)



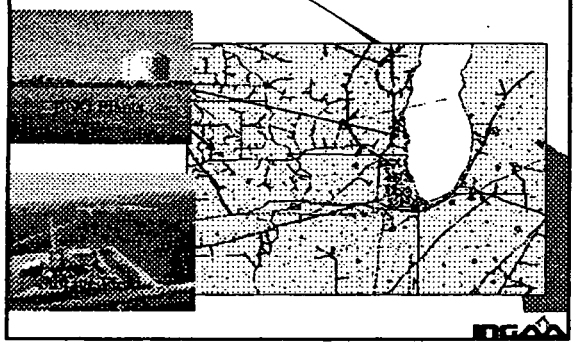
The Natural Gas Industry



Interconnects between Pipelines



LNG and Storage Facilities



Threats to Pipeline Industry

- Typical Accidents – Preparations
- Vandalism - Preparations
- Cyber terrorism - Preparations
- Personnel Sabotage
- Car & Truck Bombs
- Rocket Propelled Grenade (RPG)
- Bio Terrorism
- Chemical
- Airborne
- Radiation

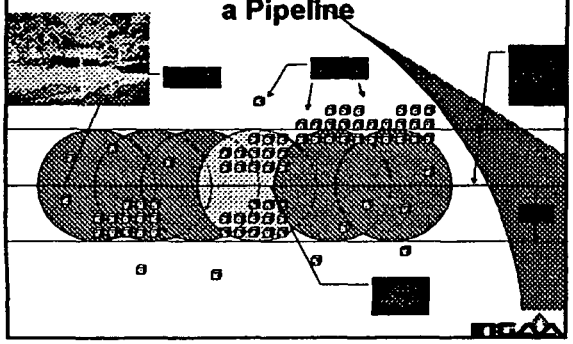
Results of Terrorist Actions

- Disable a Facility
  - Pipeline
  - Compressor
  - Meter
  - Offshore Platform
  - LNG Tank
  - Bridge
  - Gas Control
- Commandeer a Facility
  - Compressor
  - Meter
  - Gas Control
  - SCADA

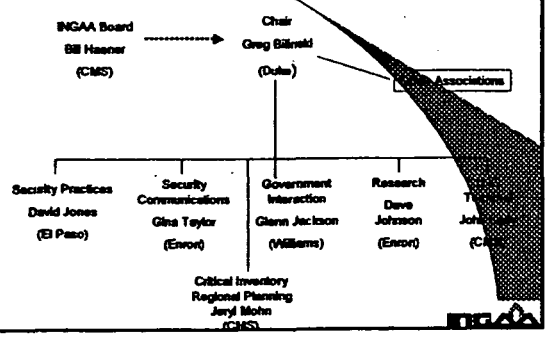
Critical Facilities for the Natural Gas Transmission Industry

- Public Safety – Areas of high population density near pipeline
- Public Service – Vital service to military, government, industrial complexes, electric power plants, and communities
- Financial Stability of Company

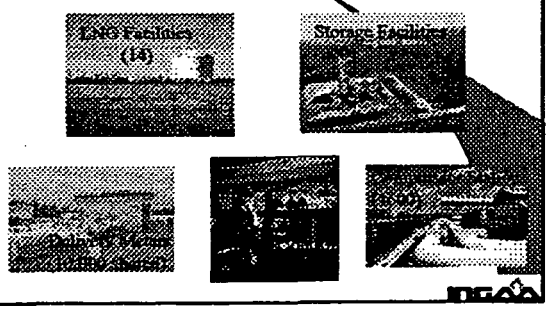
High Density Populated Area Near a Pipeline



INGAA Security Task Force Organization



Above Ground Facilities are More Susceptible



Security Practices Philosophy

- Utilize Risk Management Principles
- Recommend Practices
  - Detection
  - Preparedness
  - Deterrence
  - Response
  - Recovery

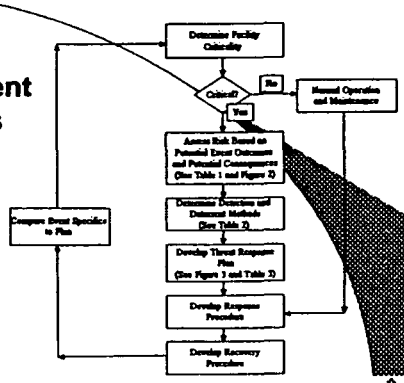
Practices Efforts

- Security Practices Survey - Complete
- Security Practices Report - Complete
  - Notification Procedures
  - Critical Facilities
  - Risk Assessment Process
- Recommended Practices – In Progress
  - Capital Expenditures
  - O&M Expenditures

Security Practices Report Ranking the Consequences

	Operation Affected	Facility Destroyed
Public Safety	[illegible]	[illegible]
Public Service	[illegible]	[illegible]

Risk Assessment Process



Determining O&M Actions

	Risk Category A	Risk Category B	Risk Category C	Risk Category D
Condition State High	[illegible]	[illegible]	[illegible]	[illegible]
Condition State Medium	[illegible]	[illegible]	[illegible]	[illegible]
Condition State Low	[illegible]	[illegible]	[illegible]	[illegible]
Condition State Normal	[illegible]	[illegible]	[illegible]	[illegible]

Communications Philosophy

- Reinforce existing programs that support safety and security
- Reassure the public that we are detecting terrorist activity along the pipelines
- Support member companies in case of a crisis on one of the pipelines by communicating a consistent message about terrorism on pipelines

Communication Efforts

- Developing specific security messages and communication plans for stakeholders including:
  - The public defined as landowners, neighbors and limited mobility assistance facilities
  - Emergency Response Officials
  - Law Enforcement Officials

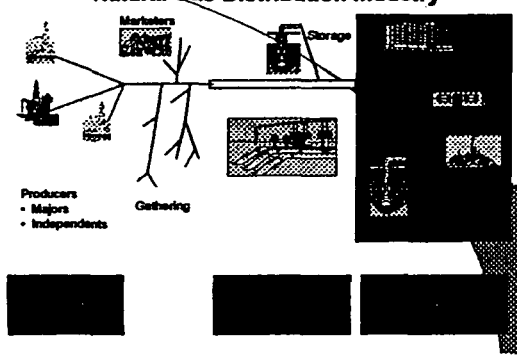
R&D Philosophy

Identify technologies that, with near term development, could be effectively applied to mitigate security threats to pipeline facilities and their operation thru enhanced deterrence, detection, response, or recovery

Critical Inventory and Regional Planning Philosophy

- Critical Inventory
  - Identify Critical Items Based On the Type of Threat
  - Formalize Part Exchange Programs
- Review and Improve Quick Recovery Process
  - Physical Assets in Place to Move Gas
  - Y2K was Test of Interdependencies
  - Minimize Antitrust Concerns
  - Minimize Regulatory Impediments
  - Ownership of Gas

Natural Gas Distribution Industry



Above Ground Facilities are More Susceptible

AGA American Gas Association

Security, Integrity & Reliability Committee

Mission
To promote security, infrastructure integrity and reliability of the nation's natural gas utilities

Scope
Operational reliability and infrastructure security (pipeline safety, integrity management, physical and cyber security)

AGA American Gas Association

AGA Committees

Tom Nilson
Peoples Energy

Dorothy Hawkins
NiSource

Mike Forman
NiSource

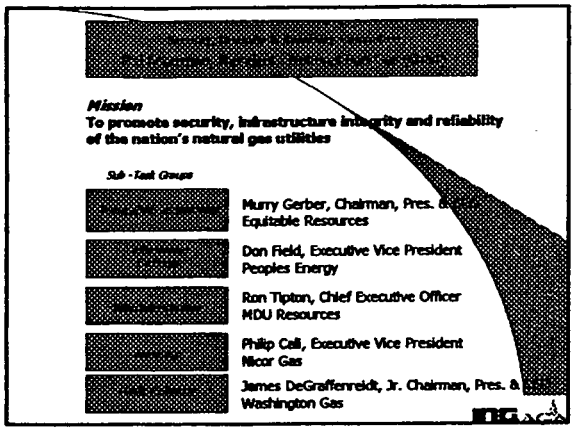
Gary Fo
Columbia
Transmiss

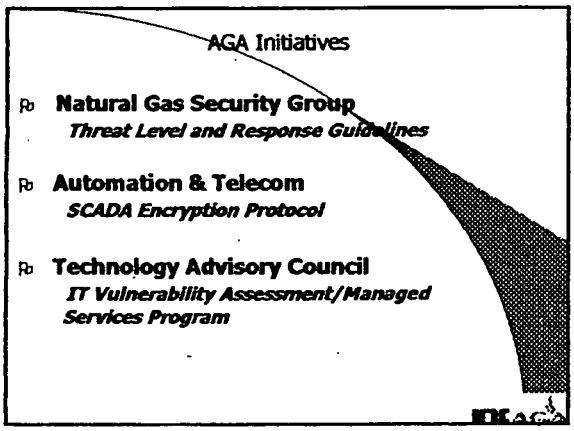
Paul Pirro
PSE&G

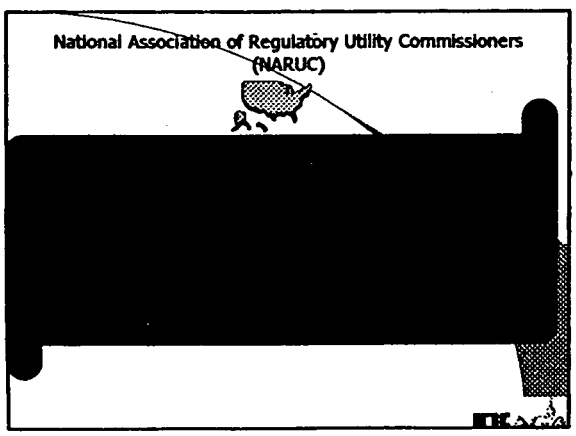
Bruce Painter
Energen

Dudley Reynolds
Alabama Gas

Michael Do
Washington Gas







[illegible]

Mission
To promote security, infrastructure integrity and reliability of the nation's natural gas utilities

Sub - Task Groups

[illegible]	Murry Gerber, Chairman, Pres. & [illegible] Equitable Resources
[illegible]	Don Field, Executive Vice President Peoples Energy
[illegible]	Ron Tipton, Chief Executive Officer MDU Resources
[illegible]	Philip Cali, Executive Vice President Nicor Gas
[illegible]	James DeGraffenreidt, Jr. Chairman, Pres. & [illegible] Washington Gas

AGA Initiatives

- **Natural Gas Security Group**
  Threat Level and Response Guidelines
- **Automation & Telecom**
  SCADA Encryption Protocol
- **Technology Advisory Council**
  IT Vulnerability Assessment/Managed Services Program

National Association of Regulatory Utility Commissioners (NARUC)

[redacted]

Recommendations

- One government agency should have responsibility for oversight and coordination of infrastructure security programs in the energy sector.
- Coordinated approach with all jurisdictions to ensure that industry's access to law enforcement and intelligence information is timely and actionable.
- Minimize jurisdictional conflicts among government entities through preplanning.

Recommendations

- Common definition of threat levels consistently applied by each government entity with jurisdiction over the energy sector.
- Response actions to issued threat levels for critical facilities will be different for each company - based on their own individual vulnerability assessment.
- Limit Information Dissemination on Location and Criticality of Facilities (i.e. "How to Connect the dots")

Recommendations

- Common understanding within the federal and state government of what is expected from natural gas industry for preparedness and response.
- Modify or waive federal, state and local regulatory requirements, permits and criminal investigations to assist quick recovery.
- Review antitrust provisions to facilitate emergency gas rerouting, curtailment, and planning for emergencies.

December 8, 1994

NOTE FOR: BETH ARNER, EXECUTIVE ASSISTANT, S-1
DAWN SCHREPEL, TRIP COORDINATOR, PO-1

FROM: MARILYN DILLON
ADMINISTRATIVE AND HUMAN RESOURCE MANAGEMENT STAFF
HUMAN RESOURCES AND ADMINISTRATION

SUBJECT: OUTSTANDING PAYMENTS FOR CHARTERED AIRCRAFT TO PAKISTAN -- SEPTEMBER, 1994

Payments for travel aboard the chartered aircraft to Pakistan have not been received from nearly one-third of the business delegation. These funds are required to reimburse the Department of Interior and Department of Energy for payment. It is of the utmost urgency that these companies are once again contacted concerning nonreceipt of their payment. Unfortunately, this situation demonstrates the necessity to collect airfares in advance of the Department's trips.

Listed below are the passengers and their respective companies for whom payment has not been received:

Passenger	Company	Amount Outstanding	
Nicholas Muller	Ampak	$6,477	$100
Anwar Shareef	Alpha Gamma Tech	6,477	100
Ken Parker	Argonaut	6,477	100
Douglas Bloss	Armstrong International	3,238.50	(pd partial amt)
Don Kendall	Cogen	3,238.50	(pd partial amt)
Terry Thorn	NRON	3,238.50	1/2 fare charged
Ramon Marin	Fulton Industries	6,477	100
Saeedullah Paracha	Habibullah	6,477	100
Ram Arora	Hydrovision	6,477	100
Charles Trabandt	Merrill Lynch	6,477	100
Charles White	Raytheon	6,477	100
John McAtee	Smith Barney	6,477	100
Furqan Siddiqu	Synergics	6,477	100

Please advise me of any action you are able to take regarding the nonreceipt of payments from the above companies. Please call me on 6-4919 if you have any questions.

(A)

P.191

7.

DOE billing/collection & payment status at

Paid DOI

08/11/95 C:\QPRO\FILES\DOE-BILL.WQ1
13:09:42

Passengers: Last	First	Agency/ Firm	Total Bill	DOE Billed/Paid	Other Agency Billed/Paid	Federal Paid	Private Sector Billed	Paid	Unpaid	DOE Exec Fee	Refund Amount
Aboud	Konica	DOE	$1,289.00	$1,289.00		$1,289.00					
Alcock	Frank	DOE	$6,477.00	$6,477.00		$6,477.00					
Amman	Bud	DOE	$6,477.00	$6,477.00		$6,477.00					
Arora	Ram	Hydrovision Inc.	$6,477.00				$6,477.00		$6,477.00		
Bernstein	Mark	DOE	$1,289.00	$1,289.00		$1,289.00					
Bhattachar	Kumar	DOE	$6,477.00	$6,477.00		$6,477.00					
Biddison	J Michael, Co	Ohio PUC	$6,477.00	$6,477.00		$6,477.00					
Bloss	Douglas	Armstrong International	$3,238.50				$3,238.50		$3,238.50		
Browning	Andrew	DOE	$1,289.00	$1,289.00		$1,289.00					
Buford	Dennis	DOE Security	$6,477.00	$6,477.00		$6,477.00					
Dixon	Dale	DOE Security	$6,477.00	$6,477.00		$6,477.00					
Dottori	Johannah	DOE	$6,477.00	$6,477.00		$6,477.00					
Forrister	Dirk	DOE	$6,477.00	$6,477.00		$6,477.00					
Grizzle	Sam	DOE	$6,477.00	$6,477.00		$6,477.00					
Hicks	Patsy	DOE	$6,477.00	$6,477.00		$6,477.00					
Laney	Tim	DOE Security	$6,477.00	$6,477.00		$6,477.00					
Martin	Ramon	Fulton Industries	$6,477.00				$6,477.00		$6,477.00	Paid DOE	
Massey	William, Com	FERC	$6,477.00		$6,477.00	$6,477.00					
McAtee	John	Smith Barney, Inc	$6,477.00				$6,477.00		$6,477.00		
Newman	Bob	DOE Security	$6,477.00	$6,477.00		$6,477.00					
O'Leary	Secretary	DOE	$6,477.00	$6,477.00		$6,477.00					
O'Neill	Richard	FERC	$6,477.00		$6,477.00	$6,477.00					
Ochoa	Gloria	DOE	$3,238.50	$3,238.50		$3,238.50					
Paracha	Saeedullah Kh	Habibullah	$6,477.00				$6,477.00		$6,477.00	Check for deposit	
Parker	Ken	Argonaut Corp	$6,477.00				$6,477.00		$6,477.00		
Perry	Dean	BPA	$6,477.00		$6,477.00	$6,477.00					
Pitman	Bob	DOE Security	$6,477.00	$6,477.00		$6,477.00					
Profozich	Russ	DOE	$1,289.00	$1,289.00		$1,289.00					
Robert	Jim	DOE Security	$6,477.00	$6,477.00		$6,477.00					
Rosenzweig	Rich	DOE	$6,477.00	$6,477.00		$6,477.00					
Salmon-Co	Peter	DOE	$3,238.50	$3,238.50		$3,238.50					
Schrepel	Dawn	DOE	$6,477.00	$6,477.00		$6,477.00					
Shareef	Amar	Alpha Gamma Technologies, Inc	$6,477.00				$6,477.00		$6,477.00		
[illegible]	[illegible]	[illegible]	$6,477.00				[illegible]		[illegible]	[illegible]	
Smith	Pete	NRECA	$6,477.00	$6,477.00		$6,477.00					
Snyder	Ralph	Energy Power Systems	$6,477.00	$6,477.00		$6,477.00					
Spiller	Reggie	DOE	$1,289.00	$1,289.00		$1,289.00					
Stalon	Charles	Consultant	$6,477.00	$6,477.00		$6,477.00					
Thorn	Terry	EXROM	$3,238.50				$3,238.50	$3,238.50		Rec. Cancelled	
Tierney	Susan	DOE	$6,477.00	$6,477.00		$6,477.00					
Vitali	Andy	Commerce	$6,477.00		$6,477.00	$6,477.00					
Wallace	Carolyn	DOE	$6,477.00	$6,477.00		$6,477.00					
Wiel	Steve	Lawrence Berkeley Laboratory	$6,477.00	$6,477.00		$6,477.00					
Yoshimura	Henry	La Capra Associates	$6,477.00	$6,477.00		$6,477.00					
Steward	Leighton	1 Louisiana Land Exploration (LLE)	$6,477.00				$6,477.00	$7,000.00	($523.00)	$100.00	$423.00
Lethard	Peter	2 VECO	$6,477.00				$6,477.00	$6,477.00			
Craig	Mickey	3 Westinghouse	$6,477.00				$6,477.00	$6,477.00			
Hart	Robert	4 Coastal Corp	$3,238.50				$3,238.50	$3,238.50			
Farmer	Larry	5 Brown & Root	$6,477.00				$6,477.00	$6,477.00			
Chang	Joyce	6 Salomon Brothers	$6,477.00				$6,477.00	$6,477.00			
Scoville	John	7 Harza International	$6,477.00				$6,477.00	$6,477.00			
Roberts	Bruce	8 CS First Boston	$12,954.00				$12,954.00	$12,954.00			

(b)(2)
(b)(2)
(b)(2)
(b)(2)
(b)(2)

P.2/3

AUG 14 '95 12:39PM DEPT OF AIRCRAFT SERVICES

(C) 192

(C) 192

DOE billing/collection & payment status at

08/11/95 C:\QPRO\FILES\DOE-BILL.WQ1
13:09:42

Passengers: Last	First	Agency/ Firm	Total Bill	DOE Billed/Paid	Other Agency Billed/Paid	Federal Paid	Private Sector Billed	Paid	Unpaid	DOE Exec Fee	Refund Amount
Johannson	Thora	9 Occidental Petroleum	$6,477.00				$6,477.00	$6,477.00			
Opletree	Terry	10 Entergy Enterprises	$6,477.00				$6,477.00	$6,577.00	($100.00)	$100.00	
Mansour	Amal	11 NTCI	$6,477.00				$6,477.00	$6,477.00			
Menendez	Adolfo	12 K&M Engineering	$6,477.00				$6,477.00	$6,477.00			
Avery	George	13 Cadwalader, Wickersham & Taft	$6,477.00				$6,477.00	$6,477.00			
Bakke	Dennis	14 AES	$6,477.00				$6,477.00	$6,477.00			
Sperling	Gil	15 Andrews & Kurth	$6,477.00				$6,477.00	$6,477.00			
Castillo-B	Lori	16 EMTEX, Inc	$6,477.00				$6,477.00	$6,477.00			
Smith	James C.	17 Systems Engrg & Mgmt (SEMA) Inc	$6,477.00				$6,477.00	$6,477.00			
Kelley	Nanette	18 Agrilectric	$6,477.00				$6,477.00	$6,477.00			
Zeltman	Eugene	19 GE Power Systems	$6,477.00				$6,477.00	$6,477.00			
		20 CS First Boston						$200.00	($200.00)	$200.00	
Wu	Susan	21 ERC, Inc	$6,477.00				$6,477.00	$6,477.00			
Kendall	Don	22 Cogen Technologies	$3,238.50				$3,238.50	$3,238.50			Cancel Receivable
Conn	Dennis	23 Cyprus Amax Coal	$6,477.00				$6,477.00	$6,477.00			
Smith	Paul	24 Tenaska International	$6,477.00				$6,477.00	$6,477.00			
Sarkar	Ashish	25 OMS Generation	$6,477.00				$6,477.00	$6,477.00			
Tranen	Jeff	26 New England Electric Svc Co	$6,477.00				$6,477.00	$6,477.00			
Miller	Nicholas	27 AMPAK	$6,477.00				$6,477.00	$5,400.00	$1,077.00		Paid Per Agreement
White	Charles	28 Raytheon	$6,477.00				$6,477.00	$6,477.00			CANCEL Receivable
Trabandt	Charles	29 Merrill Lynch	$6,477.00				$6,477.00	$6,477.00			CANCEL Receivable
		Total shares	$427,450.00	$168,370.00	$25,908.00	$194,278.00	$233,172.00	$184,340.50	$48,831.50	$400.00	$423.00
				31	4	35	37	30			

Applications:

Payment to Broker	$415,000.00
OMS Administrative Fee	$12,450.00
Total applications	$427,450.00

Sources:

Private Sector Receipts	($184,340.50)
OPAC to Fed Agencies	($194,278.00)
Private sector unpaid billings	($48,831.50)
Diff.	

Summary of Billings:

Private sector, collected	$184,340.50
Private sector, uncollected	$48,831.50
Billed to FERC, 11/94	$12,954.00
Billed to BPA, 11/94	$6,477.00
Billed to Commerce, 11/94	$6,477.00
Billed to DOE, 11/94, bill 1049CM2	$168,370.00
Total Billed	$427,450.00
Total collected	$378,618.50
Difference, to be billed to DOE	$48,831.50

2012

DOE F 1325.8
(08-93)

United States Government

Department of Energy

memorandum

DATE:

REPLY TO ATTN OF: 01/31/95

SUBJECT: CR-521.2:Sweeney:35044

Regarding Pakistan Trips

TO:

Marilyn Dillon:64919 HR-1

Westinghouse Corporation	$100.00
Entek Solutions	$100.00
Salomon Brothers Incorporated	$100.00
Veco International	$100.00
Harza Engineering Co.	$100.00
The Louisianne Land & Exploration	$100.00
Agulectric Power Rartners LTD	$100.00
New England Power Service Co.	$100.00
Andrews & Kurth LLP	$100.00
K & M Enginerring & Consultiong Corp.	$100.00
Manufacturing & Technology	$100.00
System Engineering & management Assoc.	$100.00
The AES Corp.	$100.00
Occicental International	$100.00
Tenaska Inc.	$100.00
ERC, Inc.	$100.00
Cogen Tech Cap Co.	$100.00
Cyprus Amax Coal Sales Co.	$100.00
Fulton Ferracute Ind. Int.	$100.00
Power Ampak L.L.C. 35051501	$100.00
G.E. Financial Service	$100.00

Printed on recycled paper

D 9

172

Eron Corporation	B5051505	$100.00
Raytheon Engineers Contractors	B5051510	$100.00
Total		$2,300.00

Comments: The checks that OHAO has received is from the companies. The traveler is not identified, therefore we cannot identify which traveler is associated with which company.

Thank You

Donna Sweeney

Donna Sweeney
Accounts Receivable Section

Payer Report

PAYER	AMOUNT	CHECK DATE	CHECK #	CATEGORY	BILL
EENRON CORP					
	$50.00	11/7/1997	4132300597	PATENTS	FILING FEE
	$50.00	11/7/1997	4132300597	PATENTS	FILING FEE
Summary for 'PAYER' = EENRON CORP (2 detail records)					
Sum	$100.00				
ENRON CAPITAL & TRADE					
	$50.00	2/9/1999	4132008201	PATENTS	FILING FEE
	$50.00	2/9/1999	4132008201	PATENTS	FILING FEE
Summary for 'PAYER' = ENRON CAPITAL & TRADE (2 detail records)					
Sum	$100.00				
ENRON CAPITAL & TRADE RES-EGM					
	$450.00	10/20/1999	01630115726	PATENT	FILING FEE
	$450.00	10/20/1999	1630115726	PATENT	FILING FEE
Summary for 'PAYER' = ENRON CAPITAL & TRADE RES-EGM (2 detail records)					
Sum	$900.00				
ENRON CAPITAL & TRADE RES-EGS					
	$50.00	12/7/1999	4132027539	PATENT	FILING FEE
	$50.00	12/7/1999	4132027539	PATENT	FILING FEE
Summary for 'PAYER' = ENRON CAPITAL & TRADE RES-EGS (2 detail records)					
Sum	$100.00				
ENRON CORP					
	$50.00	2/4/1998	4132070664	PATENTS	FILING FEE
	$100.00	1/12/1995	0112122810	MISC	PAKISTAN
	$100.00	11/2/1995	4132300044	PATENT	PATENT
	$50.00	11/2/1995	41320043	PATENT	PATENT
	$500.00	10/8/1996	4092510625	MISC	FILING FEE
	$50.00	10/8/1996	4132035397	MISC	FILING FEE
	$200.00	8/29/1997	4132300572	MISC	ELKH-SALE
	$5,000.00	9/12/1997	4132300577	MISC	ELKH-SALE
	$100.00	10/6/1997	4132063613	FILING FEE	FILING FEE
	$50.00	1/16/1998	4132069683	PATENTS	FILING FEE
	$50.00	2/4/1998	4132070683	PATENTS	FILING FEE
	$5,000.00	9/12/1997	4132300577	MISC	ELKH-SALE
	$100.00	1/12/1995	112122610	MISC	PAKISTAN
	$200.00	8/29/1997	4132300572	MISC	ELKH-SALE
	$50.00	10/8/1996	4132035397	MISC	FILING FEE
	$500.00	10/8/1996	4092510625	MISC	FILING FEE

1072

10

PAYER	AMOUNT	CHECK DATE	CHECK #	CATEGORY	BILL
	$50.00	2/4/1998	4132070684	PATENTS	FILING FEE
	$100.00	11/2/1995	4132300044	PATENT	PATENT
	$50.00	2/4/1998	4132070663	PATENTS	FILING FEE
	$100.00	10/6/1997	4132063613	FILING FEE	FILING FEE
	$50.00	1/16/1998	4132069683	PATENTS	FILING FEE
	$50.00	11/2/1995	41320043	PATENT	PATENT
Summary for 'PAYER' = ENRON CORP (22 detail records)					
Sum	$12,500.00				
ENRON GAS MARKETING, INC					
	$50.00	12/16/1993	262300166	MISC	
	$50.00	12/16/1993	162300165	MISC	
	$50.00	12/16/1993	0162300165	MISC	
	$50.00	12/16/1993	0262300166	MISC	
Summary for 'PAYER' = ENRON GAS MARKETING, INC (4 detail records)					
Sum	$200.00				
ENRON GAS SERVICES CAN					
	$50.00	7/28/1994	170	MISC	FILING FEE
	$50.00	7/28/1994	000170	MISC	FILING FEE
Summary for 'PAYER' = ENRON GAS SERVICES CAN (2 detail records)					
Sum	$100.00				
Grand Total	$14,000.00				

(E) 2 of 2

Partial list of
US DOE India Business Delegation List

911

518/382-0283 (fax)

Dr. George Roland
President and CEO
Siemens Solar Industries
4650 Adohr Lane
Camarillo, CA 93012
805/482-6880
805/388-6395 (fax)

Ms. Ellen S. Roy
Vice President of Government Relations
Intercontinental Energy Group
350 Lincoln Place
Hingham, MA 02043
617/749-9800
617/740-1281 (fax)

TVINDIAV

Mr. Fred C. Schulte
President and CEO
Elgin National Industries
120 South Riverside
Chicago, IL 60606-3919
312/454-1900
312/236-2668 (fax)

Mr. Niranjan S. Shah
CEO
Globetrotters Engineering Corporation
300 S. Wacker Drive, Suite 200
Chicago, IL 60606
312/922-6400
312/922-2953 (fax)

TVINDI13.PPZ

Mr. Ishaq Shahryar
President
Solec International, Inc.
12533 Chadron Avenue
Hawthorne, CA 90250
310/970-0065
310/970-1065 (fax)

TVINDI14.PPZ

George J. Sterzinger, Esquire
Manager, Biomast to Energy Division
Future Energy Resources Company
1615 M Street, NW, Suite 800
Washington, DC 20036
202/467-6370
202/467-6379 (fax)

TVINDIAW

Mr. Richard L. Thompson
Chief Executive, Engine Division
Caterpillar Inc., Engine Division
P.O. Box 610
Mossville, IL 61552-0610
309/578-8001
309/578-2510 (fax)

(F)

Mr. Terence H. Thorn
Sr. Vice President, Government Affairs
Enron Corp.
1400 Smith Street

191

C:\data\PuB

ENRON
ATTN: Senior Vice President, Terence Thorn
P.O. Box 1188
1400 Smith Street
Houston, TX 77251

Dear Mr. Thorn:

In September 1994, you or a representative of your company traveled to Pakistan and participated in the Presidential mission on energy investment. In the spirit of partnership, there were commitments made by all participants to share in the cost of the travel and related expenses. While other participants have made full payment to settle their commitments, our records show that your account is still open.

We request that you make a check payable to the U.S. Department of Energy (DOE) in the amount of $3,238.50 and reference Pakistan trip. Please send the check expeditiously to the address provided below. Do not send payment to Boise, Idaho as instructed previously by the Office of Secretary.

U.S. Department of Energy
Office of Headquarters Accounting Operations
P.O. Box 500
Germantown, MD 20875-0500

To ensure the travel to Pakistan is free of any adverse criticism, the DOE is very anxious to achieve a full settlement as soon as possible. We request your full cooperation in this matter. If payment is not forth coming soon, please provide us information as to why a settlement cannot be achieved.

If there are any question, please call me at 301-903-4934 or Sandy Isemann at 301-903-5335.

Sincerely,

Philip R. Pegnato
Accounting Division

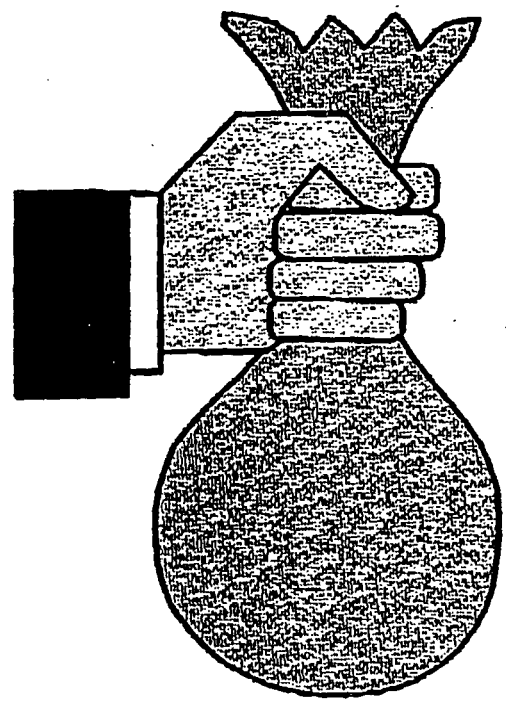
6 1071

12

2nd time Refax — Not ALL pages Went through 1st time

U.S. Department of Energy
Capital Accounting Center
Routing Symbol: ME-14
FAX Phone (301) 903-6558

TO: Mary Rosicky
69217



From: Wendy L. Miller

Date: 07/12/02

Number of Pages: 11
(Including Cover Sheet)

Comments: Refer to my E-mail
~~Data For~~ ENRON DATA CALL

Re Fax

13

NUM-UPDATE	=1
DUNS-NUMBER	=TR200086
DUNS-ORG	=
DUNS-PHONE	=
DUNS-FAX	=
DUNS-PAY-METHOD	=
DUNS-ACH	=
DUNS-VAN-NAME	=
DUNS-VAN-MAIL	=
DUNS-REMIT	=
CORRES-NAME	=ENRON GAS PIPELINE OPERATING
CORRES-ADDR1	=OR WILLIAM L. WALTON & AS
CORRES-ADDR2	=10501 WILSHIRE BLVD. #619
CORRES-CITY	=LOS ANGELES
CORRES-STATE	=CA
CORRES-ZIP	=90024
TFCS-IND	=N
TFCS-BANK-NAME	=
TFCS-BANK-CITY	=
TFCS-BANK-STATE	=
TFCS-ABA-NUM	=
TFCS-ACCT	=
LOCKBOX-ACCT	=

2

14.

```
H1,"CID",15
H1,"DCS",23
H1,"FT",27
H1,"FP",29
H1,"TT",32
H1,"MAP",36
H1,"BNR",44
H1,"USER",52
H1,"AMOUNT",65
H1,"R/S",71,SPACE A
H1,"REL-TRAN",80
LINES=23
PAUSE
NOPAGE
END
  XID        CID      DCS  FTFP TT MAP     BNR     USER        AMOUNT    R/S REL-TRAN

04810843 TR208086  10428 9877 P  P 9Q QQ0000000 FS79          $143.00    P 04810842

          T O T A L                                            $143.00

END OF XEQ FILE

>
```

PD 1992

3

NUM-UPDATE	=1
DUNS-NUMBER	=TR524979
DUNS-ORG	=
DUNS-PHONE	=
DUNS-FAX	=
DUNS-PAY-METHOD	=
DUNS-ACH	=
DUNS-VAN-NAME	=
DUNS-VAN-MAIL	=
DUNS-REMIT	=
CORRES-NAME	=ENRON CORP.
CORRES-ADDR1	=C/O RICHARD D. WIESE, SR.
CORRES-ADDR2	=P.O. BOX 1188 SUITE 3AC 3
CORRES-CITY	=HOUSTON
CORRES-STATE	=TX
CORRES-ZIP	=772511188
TFCS-IND	=N
TFCS-BANK-NAME	=
TFCS-BANK-CITY	=
TFCS-BANK-STATE	=
TFCS-ABA-NUM	=
TFCS-ACCT	=

4

```
H1,"CID",15
H1,"DCS",23
H1,"FT",27
H1,"FP",29
H1,"TT",32
H1,"MAP",36
H1,"BNR",44
H1,"USER",52
H1,"AMOUNT",65
H1,"R/S",71,SPACE A
H1,"REL-TRAN",80
LINES=23
PAUSE
NOPAGE
END
```

XID	CID	DCS	FTFP	TT	MAP	BNR	USER	AMOUNT	R/S	REL-TRAN
07839669	TR524979	11030	98Z7	P	P 9Q	QQ0000000	JU79	$25,615.00	P	07839668
	T O T A L							$25,615.00		

END OF XEQ FILE

>

Paid 1995

5

```
NUM-UPDATE        =1
DUNS-NUMBER       =TR206005
DUNS-ORG          =
DUNS-PHONE        =
DUNS-FAX          =
DUNS-PAY-METHOD   =
DUNS-ACH          =
DUNS-VAN-NAME     =
DUNS-VAN-MAIL     =
DUNS-REMIT        =
CORRES-NAME       =ENRON CORP.
CORRES-ADDR1      =C/O MICHAEL O'N. BARRON
CORRES-ADDR2      =12417 CONWAY RD.
CORRES-CITY       =ST. LOUIS
CORRES-STATE      =MO
CORRES-ZIP        =63141
TFCS IND          =N
TFCS-BANK-NAME    =
TFCS-BANK-CITY    =
TFCS-BANK-STATE   =
TFCS-ABA-NUM      =
```

6

```
H1,"CID",15
H1,"DCS",23
H1,"FT",27
H1,"FP",29
H1,"TT",32
H1,"MAP",36
H1,"BNR",44
H1,"USER",52
H1,"AMOUNT",65
H1,"R/S",71,SPACE A
H1,"REL-TRAN",80
LINES=23
PAUSE
NOPAGE
END
```

XID	CID	DCS	FTFP	TT	MAP	BNR	USER	AMOUNT	R/S	REL-TRAN
04811073	TR208085	10428	98ZZ	P P	9Q	QQ0000000	FS79	$12,976.00	P	04811072
	T O T A L							$12,976.00		

END OF XEQ FILE

>

PAID 1992

7

NUM-UPDATE	=1
DUNS-NUMBER	=TR112557
DUNS-ORG	=
DUNS-PHONE	=
DUNS-FAX	=
DUNS-PAY-METHOD	=
DUNS-ACH	=
DUNS-VAN-NAME	=
DUNS-VAN-MAIL	=
DUNS-REMIT	=
CORRES-NAME	=ENRON CORP.
CORRES-ADDR1	=MICHAEL O'N. BARRON
CORRES-ADDR2	=12417 CONWAY ROAD
CORRES-CITY	=ST. LOUIS
CORRES-STATE	=MO
CORRES-ZIP	=63141
TFCS-IND	=N
TFCS-BANK-NAME	=
TFCS-BANK-CITY	=
TFCS-BANK-STATE	=
TFCS-ABA-NUM	=
TFCS-ACCT	=

8

```
H1,"CID",15
H1,"DCS",23
H1,"FT",27
H1,"FP",29
H1,"TT",32
H1,"MAP",36
H1,"BNR",44
H1,"USER",52
H1,"AMOUNT",65
H1,"R/S",71,SPACE A
H1,"REL-TRAN",80
LINES=23
PAUSE
NOPAGE
END
  XID        CID      DCS  FTFP TT MAP     BNR     USER        AMOUNT    R/S REL-TRAN

03828742 TR112557  11425 98ZZ P  P 9Q QQ0000000 HT79      $28,344.00    P 03828741

           T O T A L                                       $28,344.00

END OF XEQ FILE

>
```

PAID - 1991

9

NUM-UPDATE	=1
DUNS-NUMBER	=TR111624
DUNS-ORG	=
DUNS-PHONE	=
DUNS-FAX	=
DUNS-PAY-METHOD	=
DUNS-ACH	=
DUNS-VAN-NAME	=
DUNS-VAN-MAIL	=
DUNS-REMIT	=
CORRES-NAME	=ENRON CORPORATION
CORRES-ADDR1	=C/O RICHARD D. WIESE, SR.
CORRES-ADDR2	=P.O. BOX 1188
CORRES-CITY	=HOUSTON
CORRES-STATE	=TX
CORRES-ZIP	=772511188
TFCS-IND	=N
TFCS BANK-NAME	=
TFCS-BANK-CITY	=
TFCS-BANK-STATE	=
TFCS-ABA-NUM	=
TFCS-ACCT	=

10

```
H1,"CID",15
H1,"DCS",23
H1,"FT",27
H1,"FP",29
H1,"TT",32
H1,"MAP",36
H1,"BNR",44
H1,"USER",52
H1,"AMOUNT",65
H1,"R/S",71,SPACE A
H1,"REL-TRAN",80
LINES=23
PAUSE
NOPAGE
END
```

XID	CID	DCS	FTFP	TT	MAP	BNR	USER	AMOUNT	R/S	REL-TRAN
03791323	TR111624	10427	98ZZ P	P	9Q	QQ0000000	HT79	$25,615.00	P	03791322
	T O T A L							$25,615.00		

END OF XEQ FILE

>

PAID - 1991

TRIP REPORT

Presidential Mission on Energy Investment to Pakistan Led by Secretary of Energy Hazel R. O'Leary

September 21-24, 1994

I. OVERVIEW OF TRIP

Opening a new chapter in United States-Pakistan relations through the development of a broad based economic relationship, Secretary of Energy Hazel R. O'Leary led a Presidential Mission on Energy Investment in Pakistan, from September 21-24, 1994, in Islamabad and Lahore, Pakistan. An official delegation of over 90 American business executives, environmental leaders and government officials accompanied Secretary O'Leary on the mission, making it one of the largest trade and investment mission ever led by a U.S. Cabinet official. The mission culminated in the signing of 16 business agreements totalling nearly $4 billion in value and in three joint Statements of Intent designed to encourage the bilateral exchange of information and ideas in the fields of energy and environment.

The mission was conducted at the invitation of Pakistan Prime Minister Benazir Bhutto. The Prime Minister sought to maintain the momentum generated by her government's macroeconomic reforms which were designed to create a favorable investment climate and the energy sector reforms which were designed to attract private foreign investment and strengthen energy partnerships with the United States.

Secretary O'Leary brought together a diverse team representing a broad spectrum of large and small energy companies, financial institutions, woman and minority-owned businesses, environmental groups and government specialists. The delegation was organized into seven energy-sector subgroups, each of which had an appropriate mix of technical, commercial, regulatory and financial expertise suitable to address specific areas of Pakistan's energy sector. These seven "pods" covered the mission's focus areas which were: finance; electric generation; transmission and distribution; renewable resources; energy efficiency and demand side management; oil and gas; and coal.

The pods engaged counterpart Pakistani representatives in discussions on their energy policies, focusing on opportunities, investment barriers and next steps necessary in the reform process to encourage investment in the energy sector. The centerpiece event for these discussions was

15

Presidential Mission on Energy Investment to Pakistan

DOE Official Delegation

Hazel R. O'Leary — Head of Delegation
Secretary of Energy

Rich Rosenzweig
Chief of Staff

Susan Tiemey
Assistant Secretary for Policy

Dirk Forrister
Special Assistant to the Secretary for Policy

Reggie Spiller
Deputy Assistant Secretary for Oil and Gas

Bud Annan
Director, Office of Solar Technology

Gloria Ochoa
Special Assistant to Assistant Secretary for Energy Efficiency and Renewable Energy

Johannah Dottori
Director, Office of Scheduling and Logistics

Carolyn Wallace
Secretary to Mrs. O'Leary

Non DOE-government

Andrew Vitali
Department of Commerce

Policy Support

Steven Fried
Public Affairs Specialist

Mark Allen Bernstein
Senior Policy Analyst, National Renewable Energy Laboratory

Moinuddin Syed Hussein
Consultant, TMS, Inc.

Kumar Bhattacharjee
Consultant, Sita Oil, Inc.

Andrew Browning
Special Assistant to Deputy Assistant Secretary for Oil and Gas

Monica Aboud
Special Assistant to Deputy Secretary

Peter Salmon Cox
Director, Office of Industrial Processes

Russell Profozich
Senior Economist, Office of Electricity Policy

Sam Grizzle
Public Affairs Specialist

Frank Alcock
International Affairs Specialist

Tom Cutler
International Affairs Specialist

Patsy Hicks
Office of Fossil Energy

Dawn Schrepel
Trip Coordinator

19 DOE
3 Non DOE
17 Private

Presidential Mission on Energy Investment to Pakistan
Led by Hazel R. O'Leary, Secretary of Energy
Official Delegation

Dr. Ram Arora, Hydrovision
George Avery, Cadwalader, Wickersham & Taft
Nadeem Babar, Cogen Technologies
Dennis Bakke, AES
Larry Becker, Zurn-NEPCO
Comm. J. Michael Biddison, Ohio PUC
Douglas Bloss, Armstrong International
Jose Brena, GE Capital
Peter Carroll, Solar Turbines
Lori Castillo-Brown, ENTEK, Inc
Joyce Chang, Salomon Brothers
Tafweez Chauhan, Intrag
Dennis Conn, Cyprus Amax Coal
Mickey Craig, Westinghouse
Lindey DeGarmo, Salomon Brothers
Frederik Dekker, Unocal
Mark Deuitch, Schwartz & Associates
Dan Donovan, Merrill Lynch
Larry Farmer, Brown & Root
James Graf, Smith Barney
Vaqar Haider, American Express
Robert Hart, Coastal Corp.
Thora Johannsen, Occidental Petroleum
James Johnson, Sidley & Austin
Nanette Kelley, Agrilectric
Donald Kendall, Cogen Technologies
Habib Khan, The Harris Group
Saquib Mawaz Khan, Kidder, Peabody & Co.
Eric Klaussmann, Energy Transportation Group
Bill Krips, Union Texas
Peter Lethard, VECO
Mir Mahboob Mahmood, Sidley & Austin
Tariq Malik, Morgan Stanley
Amal Mansour, MTCI
Ramon Marin, Fulton Industries
Rebecca Mark, ENRON
Commissioner William Massey, FERC
John McAtee, Smith-Barney
Adolfo Menendez, K&M Engineering
Nicholas Muller, AMPAK
Jay Naghib, GE Capital
Terry Ogletree, Entergy Power
Dick O'Neil, FERC
Saeedullah Khan Paracha, Habibullah Energy Limited
Ken Parker, Argonaut Corp.
Dean Perry, BPA
Mark Peterson, C.C. Pace
Ed Portoro, The Harris Group
Paul Portz, NatWest
Dr. Ata Qureshi, Climate Institute
Shajjad Razvi, Citibank
Bruce Roberts, CS First Boston
Ashish Sarkar, CMS Generation
John Scoville, Harza International
Guy Seibert, Brown & Root
Anwar Shareef, Alpha Gamma Technologies
Furquan Siddiqi, Synergics
James C. Smith, SEMA, Inc.
Paul Smith, Tenaska Intl.
Pete Smith, NRECA
Ralph Snyder, Energy Power Systems
Gil Sperling, Andrews & Kurth
Charles Stalon, Consultant
Leighton Steward, LL&E
Steven Stollman, Mission Energy
Mohan Tahiliani, Black & Veatch
Marion Thomas, Diversified Engineering, Inc.
Richard Thompson, Caterpillar
Terry Thorn, ENRON
Charles Trabandt, Merrill Lynch
Jeff Tranen, New England Electric Service Co.
Robert Walters, ENTECH
Martin Wenzel, Brooklyn Marine & Oil
Charles White, Raytheon
William Wicker, CS First Boston
Steve Wiel, Lawrence Berkeley Laboratory
Susan Wu, ERC, Inc.
Henry Yoshimura, La Capra Associates
Eugene Zeltman, GE Power Systems

TRIP REPORT

Presidential Mission on Energy Investment to Pakistan Led by Secretary of Energy Hazel R. O'Leary

September 21-24, 1994

I. OVERVIEW OF TRIP

Opening a new chapter in United States-Pakistan relations through the development of a broad based economic relationship, Secretary of Energy Hazel R. O'Leary led a Presidential Mission on Energy Investment in Pakistan, from September 21-24, 1994, in Islamabad and Lahore, Pakistan. An official delegation of over 90 American business executives, environmental leaders and government officials accompanied Secretary O'Leary on the mission, making it one of the largest trade and investment mission ever led by a U.S. Cabinet official. The mission culminated in the signing of 16 business agreements totalling nearly $4 billion in value and in three joint Statements of Intent designed to encourage the bilateral exchange of information and ideas in the fields of energy and environment.

The mission was conducted at the invitation of Pakistan Prime Minister Benazir Bhutto. The Prime Minister sought to maintain the momentum generated by her government's macroeconomic reforms which were designed to create a favorable investment climate and the energy sector reforms which were designed to attract private foreign investment and strengthen energy partnerships with the United States.

Secretary O'Leary brought together a diverse team representing a broad spectrum of large and small energy companies, financial institutions, woman and minority-owned businesses, environmental groups and government specialists. The delegation was organized into seven energy-sector subgroups, each of which had an appropriate mix of technical, commercial, regulatory and financial expertise suitable to address specific areas of Pakistan's energy sector. These seven "pods" covered the mission's focus areas which were: finance; electric generation; transmission and distribution; renewable resources; energy efficiency and demand side management; oil and gas; and coal.

The pods engaged counterpart Pakistani representatives in discussions on their energy policies, focusing on opportunities, investment barriers and next steps necessary in the reform process to encourage investment in the energy sector. The centerpiece event for these discussions was

16

Presidential Mission on Energy Investment to Pakistan

DOE Official Delegation

Hazel R. O'Leary — Head of Delegation
Secretary of Energy
Rich Rosenzweig
Chief of Staff
Susan Tierney
Assistant Secretary for Policy
Dirk Forrister
Special Assistant to the Secretary for Policy
Reggie Spiller
Deputy Assistant Secretary for Oil and Gas
Bud Annan
Director, Office of Solar Technology
Gloria Ochoa
Special Assistant to Assistant Secretary for Energy Efficiency and Renewable Energy
Johannah Dottori
Director, Office of Scheduling and Logistics
Carolyn Wallace
Secretary to Mrs. O'Leary

Non DOE-government

Andrew Vitali
Department of Commerce

Policy Support

Steven Fried
Public Affairs Specialist
Mark Allen Bernstein
Senior Policy Analyst, National Renewable Energy Laboratory
Moinuddin Syed Hussein
Consultant, TMS, Inc.
Kumar Bhattacharjee
Consultant, Sita Oil, Inc.
Andrew Browning
Special Assistant to Deputy Assistant Secretary for Oil and Gas
Monica Abond
Special Assistant to Deputy Secretary
Peter Salmon Cox
Director, Office of Industrial Processes
Russell Profozich
Senior Economist, Office of Electricity Policy
Sam Grizzle
Public Affairs Specialist
Frank Alcock
International Affairs Specialist
Tom Cutler
International Affairs Specialist
Patsy Hicks
Office of Fossil Energy
Dawn Schrepel
Trip Coordinator

19 DoE
3 Non-DoE
97 Private

Presidential Mission on Energy Investment to Pakistan
Led by Hazel R. O'Leary, Secretary of Energy
Official Delegation

Dr. Ram Arora, Hydrovision
George Avery, Cadwalader, Wickersham & Taft
Nadeem Babar, Cogen Technologies
Dennis Bakke, AES
Larry Becker, Zurn-NEPCO
Comm. J. Michael Biddison, Ohio PUC
Douglas Bloss, Armstrong International
Jose Brena, GE Capital
Peter Carroll, Solar Turbines
Lori Castillo-Brown, ENTEK, Inc
Joyce Chang, Salomon Brothers
Tafweez Chauhan, Intrag
Dennis Conn, Cyprus Amax Coal
Mickey Craig, Westinghouse
Lindey DeGarmo, Salomon Brothers
Frederik Dekker, Unocal
Mark Deuitch, Schwartz & Associates
Dan Donovan, Merrill Lynch
Larry Farmer, Brown & Root
James Graf, Smith Barney
Vaqar Haider, American Express
Robert Hart, Coastal Corp.
Thora Johannsen, Occidental Petroleum
James Johnson, Sidley & Austin
Nanette Kelley, Agrilectric
Donald Kendall, Cogen Technologies
Habib Khan, The Harris Group
Saquib Mawaz Khan, Kidder, Peabody & Co.
Eric Klaussmann, Energy Transportation Group
Bill Krips, Union Texas
Peter Lethard, VECO
Mir Mahboob Mahmood, Sidley & Austin
Tariq Malik, Morgan Stanley
Amal Mansour, MTCI
Ramon Marin, Fulton Industries
Rebecca Mark, ENRON
Commissioner William Massey, FERC
John McAtee, Smith-Barney
Adolfo Menendez, K&M Engineering
Nicholas Muller, AMPAK
Jay Naghib, GE Capital
Terry Ogletree, Entergy Power
Dick O'Neil, FERC
Saeedullah Khan Paracha, Habibullah Energy Limited
Ken Parker, Argonaut Corp.
Dean Perry, BPA
Mark Peterson, C.C. Pace
Ed Portoro, The Harris Group
Paul Portz, NatWest
Dr. Ata Qureshi, Climate Institute
Shajjad Razvi, Citibank
Bruce Roberts, CS First Boston
Ashish Sarkar, CMS Generation
John Scoville, Harza International
Guy Seibert, Brown & Root
Anwar Shareef, Alpha Gamma Technologies
Furquan Siddiqi, Synergics
James C. Smith, SEMA, Inc.
Paul Smith, Tenaska Intl.
Pete Smith, NRECA
Ralph Snyder, Energy Power Systems
Gil Sperling, Andrews & Kurth
Charles Stalon, Consultant
Leighton Steward, LL&E
Steven Stollman, Mission Energy
Mohan Tahiliani, Black & Veatch
Marion Thomas, Diversified Engineering, Inc.
Richard Thompson, Caterpillar
Terry Thorn, ENRON
Charles Trabandt, Merrill Lynch
Jeff Tranen, New England Electric Service Co.
Robert Walters, ENTECH
Martin Wenzel, Brooklyn Marine & Oil
Charles White, Raytheon
William Wicker, CS First Boston
Steve Wiel, Lawrence Berkeley Laboratory
Susan Wu, ERC, Inc.
Henry Yoshimura, La Capra Associates
Eugene Zeltman, GE Power Systems

TRIP REPORT

PRESIDENTIAL MISSION ON SUSTAINABLE ENERGY AND TRADE TO INDIA LED BY SECRETARY OF ENERGY HAZEL O'LEARY

July 7 - 15, 1994

INTRODUCTION

United States Secretary of Energy Hazel R. O'Leary's headed a Presidential Mission to India, July 7-15, 1994. The Mission began a new era for partnerships between the United States and India by closing commercial deals valued at more than $400 million. In meetings with the Indian government, the delegation advanced other fast-track power projects valued at over $3 billion and reached several important government-to-government agreements on energy and environmental cooperation.

Conducted at the initiative of President Bill Clinton after his May 19, 1994 meeting with Prime Minister P.V. Rao in Washington, D.C., the mission was the first official visit to India by a U.S. cabinet secretary in many years. It included an official delegation of over 60 leading business executives, environmental leaders and government officials. For the first time in Department history, the delegation included a diverse complement of renewable energy and energy efficiency companies, and small, minority and women-owned businesses as well as executives from large American multinational corporations.

President Clinton defined the goals and objectives of the mission in a July 5 letter to the delegation, charging them to promote Indo/U.S. cooperation in energy, sustainable development and free trade. The President urged the mission to "forge new bonds of friendship and collaboration with India's business leaders... to foster new alliances with environmental and public interest groups to assure a broad base of support for our emerging partnerships... [and] to build on the shared commitments that Prime Minister Rao and I made to expand the commercial ties between our nations."

The Indian government shared these goals, which produced an atmosphere for remarkable progress. The mission was welcomed warmly by the Indian people, ranging from the Prime Minister Rao to senior-level civil servants to the working people in rural villages. The visit received impressive media coverage with over 50 newspaper articles and numerous television accounts. One newspaper described the visit by saying, "Hazel O'Leary may be the U.S. Energy Secretary, but diplomacy is high on her agenda on this visit to India as is sustainable energy development... If Indo-US relations were prickly for the past year, they certainly seem

to be on the mend now." (*"A charming mix of business and diplomacy,"* The Times of India, July 13, 1994, p. 13.)

The delegation had an ambitious schedule of official meetings in New Delhi and Bombay with Indian representatives from government, business and non-governmental organizations. The trip included private commercial negotiations as well as detailed policy discussions in public round-tables. The group toured power plants, renewable energy centers, a rural village and cultural sites-- notably the Taj Mahal. Finally, the mission included several celebrations of our new partnerships in the form of dedications of Sustainability Centers, announcements of joint ventures and festive evening receptions that will lead to lasting personal friendships and valuable professional relationships.

In sum, Secretary O'Leary's Presidential Mission on Sustainable Energy and Trade marked an historic milestone in Indo/U.S. relations by building strong relationships with government and industry, establishing public trust with broad constituencies and advancing near-term business deals as first steps toward free trade. The legacy of this visit will be most significant over the long-term as increased commercial links and government contacts foster sustained economic growth in both nations.

HIGHLIGHTS & TRIP SUMMARY

President Clinton's May 19, 1994, meeting with Prime Minister Rao opened a tremendous opportunity to move past the years of strained Indo/U.S. relations and into a new era of partnership and trust. For the U.S. delegation, the opportunity was particularly ripe, because energy is the Prime Minister's top priority in advancing India's sustainable development goals. The Prime Minister sent a strong signal through his government of the high value he placed on this mission by scheduling an hour-long meeting with Secretary O'Leary.

The Prime Minister's interest in energy stems from the fact that shortages of electric power are the major bottleneck in achieving India's economic goals. Over the next fifteen years, India will register the one of the greatest increases of electric generation capacity in the world, second only to China. It expects to add nearly 60,000 megawatts of electrical power by 2000, and over 140,000 megawatts by 2007-- requiring investment of approximately $200 billion.

Importantly, the delegation worked extremely hard to develop a joint strategy on how to make the most of this unprecedented mission. In small group ("pod") discussions held during the plane trip to India and continuing in weekend preparation sessions, the group defined a series of common goals, strategies and desired outcomes. The general approach was to establish trust with the Indian hosts in government and the private sector before pressing matters of policy and business. The U.S. team also sought to understand the needs of the average people in India, their cultural and spiritual values, and to appreciate how these dynamics

translate into political constraints and opportunities for policy-makers. The mission hoped to demonstrate the mission's understanding of the value of political consensus through the composition of the U.S. delegation-- a joint effort of government, business and environmental leaders. Finally, the delegation hoped to create a positive climate for moving forward the mission's policy agenda and, in the end, to close business deals that would mutually benefit India and the United States.

The delegation also sought to be well prepared substantively for the week's busy schedule, taking advantage of briefings offered by the U.S. Embassy and representatives of American companies already active in India on the Indian energy outlook, policy framework and trade barriers to foreign companies trying to do business with Indian firms.

From the moment Power Minister Salve met the Secretary at the airport on Friday, July 8, for an arrival press conference, a tone of enthusiasm and excitement invigorated the mission. A Sunday luncheon with key energy ministers and officials formally opened a positive dialogue that continued in a Government-to-Government Roundtable on Monday. As each of the Indian Ministers outlined their priorities, the delegation found them to be closely aligned with U.S. interests. Where there were differences, the mission sought opportunities to resolve them.

Sunday evening's visit to the Taj Mahal at sunset provided the delegation with a deep appreciation for the cultural history that unites India. The Secretary's announcement of a joint program to reduce emissions from energy sources in the region that threaten the monument symbolized the importance of Indo/U.S. cooperation. This offer of technical assistance was well received throughout India.

Tuesday, July 12, Secretary O'Leary met with Prime Minister Rao, signaling to the Indian public the mission's high level of importance. After presenting the Prime Minister with a letter from President Clinton, Secretary O'Leary noted the historic opportunity for Indo/U.S. partnerships in sustainable energy and commended the Prime Minister on his vision for more renewable energy. She urged prompt action on seven "fast track" powerplant projects as the best accomplishment on which to build future collaboration on the nearly 60 projects ripe for action. The Prime Minister reiterated his support for the seven projects and assured her that all possible measures would be taken to move them forward. He proposed the establishment of a sub-commission under the Indo/U.S. Joint Commission to expedite private power projects. Finally, he affirmed the appropriateness of opening a nuclear safety dialogue between experts in India and the U.S.

Over the next three days, the delegation visited privately with the Ministers for Finance; Power; Non-Conventional Energy; Environment and Forests; Petroleum and Natural Gas; and Coal. In addition, a small business delegation met with the Minister of Law. Overall, these meetings exceeded expectations in gaining commitments to advance the joint agenda (see accomplishments listed below). The Ministers' enthusiasm was evident in the fact that they also appeared at a number of receptions and public events related to the Secretary's visit.

In particular, Power Minister Salve became a strong ally, envisioning ways to meet the needs of the Indian public through partnerships with independent power developers and renewable energy producers. Also, the delegation found helpful renewable energy partners in Minister for Non-Conventional Energy Kumar and the Minister of Environment and Forests Nath.

One of the key issues cutting across the variety of energy deals advocated by Secretary O'Leary was that of project finance. In recognition of this, the Indian government accorded this issue high priority in talks with the delegation. Finance Minister Singh met privately with the Secretary and then participated in a vibrant roundtable exchange with members of the delegation, contributing much more time than expected. He reassured the delegation on a number of points relating to project finance and import duties, and these points will be key factors in the follow up to the trip.

Power Minister Salve and Secretary O'Leary shared the vision that the path to sustainable energy development must lead to benefits for the average citizen. To understand this, Dr. R.K. Patchauri arranged for the delegation to visit Dhanawas, a tiny hamlet of 300 households. This provided tremendous insight into the lives of the 700 million Indians who live in rural villages, and how important sustainable energy is to them. After a walk up a new brick road laid for the visit, Secretary O'Leary joined a lively celebration in honor of the delegation. School children sang and danced. Under a colorful tent, the Secretary sat cross-legged with hundreds of women from the village who described their hopes and concerns and talked about ways that new types of energy could create new opportunities. More than any other single part of the mission, the visit to Dhanawas reminded the delegation members why they were in India: not only to promote Indo/U.S. trade, but to promote equitable social and economic progress in both of countries. Development is only sustainable if, in the end, it contributes to the well-being of all people.

The Indian media followed this event with interest, given the delegation's interest in gaining an appreciation for village life. In wide press coverage, news accounts described the reaction of people in the village:

> The villagers, whose lives today are changed with the use of this [renewable] technology, were eager to meet the expert from America who was coming all this way to their village.
>
> The women donned their festive ghagra-cholis and jewelry, and the entire village waited patiently in the school compound, some even on the rooftops overlooking the compound to greet Ms. O'Leary.... She was mobbed by villagers eager for a glimpse of her as soon as she arrived.
>
> The women could relate to Ms. O'Leary as one of them but someone more powerful who would help them solve their immediate problems. Ms. O'Leary was encouraging. "I believe in you," she said. "We need you to continue to speak out, but you could

also be the leader." (*"Haryana women find O'Leary more powerful but one of them,"* The Asian Age, July 14, 1994, page 2.)

That same day, the delegation toured a the Ministry of Non-Conventional Energy's Solar Energy Research Center, where foreign products are tested for application in India. At this event, a number of village leaders exhibited displays of ways they are using renewable technologies to power cottage industries in their towns. Next door, the delegation joined Dr. R.K. Patchauri and his staff at the Tata Energy Research Institute (TERI) to tour their sustainable energy campus' demonstration projects on biomass-to-energy conversion and reforestation. Secretary O'Leary dedicated the Center for Energy and Sustainable Development, a cooperative project between the TERI, the Indian Ministry of Non-Conventional Energy and the U.S. Department of Energy. The Center will be a first point-of-contact for firms entering the Indian market for energy efficiency and renewable energy and will facilitate joint ventures, particularly for small and medium-sized businesses, like some of those present from the U.S. delegation.

A number of group events worked to bring Indian and U.S. business and environmental leaders together. A well-attended luncheon with the Confederation of Indian Industries opened dialogue between the U.S. and Indian business communities. It led to the signing of a joint agreement between the S.K. Bhargava, President of the Confederation of Indian Industries, and delegation member Ellen Roy, Chair of the National Independent Energy Producers in the United States, on cooperation in private power policy development. The Confederation also signed a cooperative agreement with the U.S. Renewable Energy Resources Association.

A day-long *Indo/U.S. Energy Summit: Cooperation for Sustainable Development* provided a platform for Secretary O'Leary and her counterparts in the energy ministries to set forth their visions of future cooperation and to lay a foundation for productive discussions at the breakout sessions. The Summit drew together over 500 government, industry and environmental participants. It stimulated over 200 new business meetings between delegates and Indian businesses that occurred that evening and the following day. These business contacts hold great potential for deals that could produce jobs for workers both in India and the U.S.

In the Summit's plenary session, Minister of Power Salve braced the Indian public for possible electricity rate increases to finance new power projects. This was a bold stance to take politically as elections near, but it provided an important message for project developers and financiers. He stressed the importance of using appropriate technologies for generation, transmission and distribution. And importantly, he emphasized that counter-guarantees by the national government would be required for the first several power projects with various state electricity boards in order to attract capital from international financiers, since the boards are not financially stable enough to satisfy lenders.

In her keynote speech to the Summit, Secretary O'Leary communicated a message of friendship by stressing the common heritage of India and the United States, particularly in the inspiration Mahatama Gandhi provided to Martin Luther King and the American civil rights movement. She advocated building on the Indian and U.S. common past of promoting liberty and democracy by advancing free trade between the two nations. She proposed cooperative approaches to sustainable development that would bring U.S. advanced technology and expertise to help meet India's tremendous energy needs. To assure progress, she proposed to meet again every six months, beginning with an Indian visit to the U.S. early in 1995 and continuing with her return visit to India within a year.

After the plenary session, the Summit continued in five technical sessions: Renewable Energy; Oil and Gas; Coal Mining, Preparation and Industrial Utilization; Power Generation, Transmission and Distribution; and Energy Resource Integration and Management. In addition, a project finance session was held with all participants at the Summit. Each of these sessions produced specific recommendations for actions which will be addressed in the mission follow up work.

Wednesday, July 13, Secretary O'Leary and members of the delegation travelled to the outskirts of Delhi to dedicate the National Thermal Power Corporation's Energy Efficiency and Environment Center. The Department of Energy, the Agency for International Development and the United States/Asia Environmental Partnership representatives committed to work in partnership with electric utilities in India to improve the environmental performance and efficiency of India's electric power production, transmission and distribution systems. Environment and Forest Minister Nath hosted a luncheon for the Secretary and delegates representing environmental groups.

In a special session on "Indo/U.S. Energy Partnerships for the Future," which was separate from the Summit, non-governmental organizations facilitated discussion with a cross section of 40 people from government, industry and environmental organizations. They took the recommendations from the Summit and produced an action plan for integrating environmental groups into cooperative government and business projects resulting from the mission.

The New Delhi visit ended with a press conference packed with reporters. Nine commercial business deals were signed and five government-to-government agreements were entered. There were more renewable energy projects announced than on any previous trade mission, as well as the first signing of a pilot project in India that would be submitted for consideration under the U.S. Initiative on Joint Implementation.

In Bombay Thursday, July 14, Secretary O'Leary and members of the delegation participated in a Roundtable on Mobilization of Project Financing. This group of over 100 financiers recommended that the Government of India move promptly to provide counter-guarantees to the seven "fast track" power projects and that it consider continuing to offer counter-guarantees for projects until state electricity boards are more financially solid. The U.S.

delegates from the financial community committed to return in six months to conduct further work and to measure progress.

A significant advancement occurred when Secretary O'Leary, Nuclear Regulatory Commissioner Gail de Planque and other nuclear energy experts on the delegation met with Indian Atomic Energy Commission Chairman Chidambaram and reached agreement on regular consultations on nuclear safety.

The mission closed with a major announcements of the first energy efficiency services contract between a U.S. efficiency firm and an Indian textile mill and of a joint venture that will bring solar lantern to rural India and produce manufacturing jobs in India and California. Bombay Mayor Sumitra Samand Prabhabalkar presented Secretary O'Leary with a artistic depiction of the sun, and the Secretary reciprocated with a gift of a solar lantern. These signings took place along-side a mock village complete with local artisans.

The evening ended with an state dinner hosted by Chief Minister of Maharashtra Province, Mr. Sharad Pawar. Power Minister Salve flew to Bombay for the dinner to bid farewell to Secretary O'Leary and the delegation. He also accompanied the delegation to the airport for a final send-off. This important gesture by Minister Salve illustrates the mission's success in forging ties with Indian leaders that will support increased commerce in sustainable energy between India and the United States.

ACCOMPLISHMENTS

I. RENEWABLE ENERGY

Opportunities for Cooperation:

Renewable energy enjoys substantial political support in India at the highest levels, championed not just by the Ministry of Non-Conventional Energy Sources and the Ministry of Environment and Forests, but also by the Prime Minister himself.

The Ministry for Non-Conventional Energy Sources estimates that 100,000 rural villages in India are without electricity and has established a 1997 goal of 2,000 megawatts of installed renewable energy capacity, a ten-fold increase. For these communities, wind and solar energy may be particularly cost-effective when compared against electricity distributed from large central power stations. In agricultural settings, biomass is also an attractive strategy for making sustainable use of agricultural waste. Current renewable/cogeneration proposals total nearly 27,000 megawatts of capacity potential. For example, 10,000 megawatts of capacity from use of bagasse is projected for the sugar industry alone.

Barriers:

- Tariffs on renewable energy equipment are high and sometimes unpredictable, ranging from 25% to 300%. They create artificially high prices for use of these sustainable technologies.

- Technical cooperation in product testing and certification is needed to assure local acceptance of U.S. renewable energy products.

- Procedures for establishing joint ventures are cumbersome and slow projects down.

- The terms established by the Indian Renewable Energy Development Agency for accessing World Bank financing of $450 million are not attractive to investors. The paperwork is complex and the interest rates are high.

Accomplishments:

The Mission resulted in the following, mutually agreed actions to support reaching India's ambitious 2,000 megawatt goal for renewables:

- The Department and the Indian Ministry of Non-Conventional Energy Sources signed the Statement of Intent to Cooperate on renewable energy development.

- Four inaugural projects to be conducted within the framework of the Statement of Intent were identified.

  - Advanced biomass gasification
  - Rural electrification
  - Photovoltaic concentrator evaluation program
  - Cooperation on technology standards and specifications

- The Secretary agreed to increase cooperation between the Ministry's Solar Energy Center and the Department's National Renewable Energy Laboratory.

- To advance private sector partnerships, the U.S. Renewable Energy Resources Association signed a cooperative agreement with the Confederation of Indian Industries.

- To streamline, standardize, and shorten the joint venture process, the Ministry of Non-Conventional Energy Sources agreed to establish a special organizational unit to expedite joint venture applications and resolve issues brought to them by specific ventures.

- The Indian government agreed to accelerate consideration of standardizing customs and tariffs on U.S. renewable energy products imported into India. Discussions on this issue are to begin immediately among the appropriate authorities in India.

- To resolve issues impeding the flow of the $450 million fund for renewables administered by the India Renewable Energy Development Agency, the Department agreed to hold a meeting in September 1994 in Washington between U.S., Indian, and World Bank officials responsible for disbursement procedures.

- Finally and most importantly, a record number of renewable energy joint ventures were announced as part of the mission. The total near-term value of these ventures is $202 million. Mid-term opportunities resulting from these initial efforts are projected to be in excess of $500 million. The job creation potential for these ventures is estimated to be 4,400. The projects are listed on the following chart:

MISSION SUCCESS IN RENEWABLE ENERGY

VENTURE PARTNERS	*DESCRIPTION*	*NEAR TERM BENEFITS*
Baharat Electronics & Spire Corporation	Sale of photovoltaic manufacturing equipment for Indian production	$2 million 50 jobs in Massachusetts
Pentafour/Solec	Sale of U.S. produced photovoltaic cells for module assembly in India	$6.5 million 150 jobs in California
Bangor Group & Cannon Power Corp.	Opening of Cannon office in India & signing agreement on 25 MW wind farm	$75 million
ESVIN TECH & MTCI	Licensing U.S. gasification technologies for Indian waste to energy market	[To be determined]
Bhoruka & SRC International	Efficiency and demand side management contract for Bombay textile firms	$3.8 million 84 jobs in India & U.S.
Emgee Solar & Martin Marietta	Develop photovoltaic systems and begin joint venture manufacturing	$66 million 1,450 jobs in Colorado
Siemens India & Siemens Solar Industries	Assemble and sell solar lanterns with components manufactured in the U.S.	$40 million 880 jobs in California
Tata Energy Research Institute, Lockheed Environmental Services, Econergy International, Duke Engineering and Services, Environmental Defense Fund, TransAlta Utilities and Niagara Mohawk Power	Develop a bagasse-fired cogeneration facility at 4 Indian sugar mills as joint implementation pilot project	[To be determined]
Delton Cable & Ovonics	Sale of production equipment and license for Indian production of advanced batteries	$9 million 200 jobs in Michigan

II. ENERGY EFFICIENCY

Opportunities for Cooperation:

One of the most promising areas for Indo/U.S. cooperation is in improving energy efficiency. Nearly half of all of India's energy consumption is in its industrial sector. The energy intensity component of the gross domestic product in India is 40 % higher than in the U.S., so there is considerable potential for the U.S. to assist India in energy efficiency.

Improved energy efficiency is important to India's sustainable economic development for several reasons. It could provide the least-cost increment of additional energy without the need for building new generating capacity. Energy efficiency activities would add to the job market-- especially with moderate to lower-skilled jobs. Building efficient energy use into the operation of an expanding economy would save money compared with retrofitting equipment later to address the already serious air and water quality concerns in industrialized urban areas. This type of focus on energy efficiency could result in an expanded market for many U.S. services and products as well as a very effective response to the nation's international environmental commitments.

The Indian government clearly recognizes the valuable role that energy efficiency can play in conserving resources, improving living conditions, and stimulating the economy. And it recognizes that proper price signals are important to advance efficient end use. As noted before, Power Minister Salve announced a significant policy development with impacts on energy efficiency: that electric power subsidies would have to be phased out and rates increased if the people of India want to enjoy the benefits of high quality electric power. This was widely reported in the local and national press and sent a signal to efficiency firms and power developers alike that the economics of cooperation will improve.

Barriers:

The Indo-U.S. Energy Summit and the subsequent roundtable discussions identified several issues that will need to be addressed to improve the climate for energy efficiency:

- India's energy pricing structure is over-burdened with subsidies and does not reflect full costs. In many instances, it reflects *no* costs-- because power is stolen by unmetered connections to the electricity distribution system. Theft of electric power amounts to nearly 42% of generated power in some areas, and that rate could increase with electricity rate increases.

- There is not an effective governmental capability to guide the generation, transmission, and distribution of power.

- There is an insufficient evaluation framework through which energy options can be compared, such as through integrated resource planning, under which energy efficiency options would prove attractive.

Accomplishments:

- SRC International and Bhourka Corp. signed an agreement to establish and operate India's first energy services company. This joint venture will manage the energy use in a textile manufacturing facility. The project is anticipated to save $1.8 million per year and will pay-back the investment within two years.

- Secretary O'Leary and Minister Salve signed a Statement of Intent to Cooperate on Energy Efficiency. The statement called for cooperation in setting appliance and equipment standards, establishing energy service companies and sharing government experience in market conditioning activities and integrated resource planning. This statement will serve as a guide for both program and policy interface between India and the U.S.

- The Joint Secretary for Energy Efficiency of the Ministry of Power and staff of the Oak Ridge National Laboratory agreed to collaborate on techniques to stop transmission and distribution power losses.

- The mission committed to U.S. participation in key Indian energy conferences in 1994 and 1995 as a means of providing training in integrated resource planning, demand-side management, load shaping modeling and computer simulation, integration of renewable sources, and end-use efficiencies.

- Secretary O'Leary and Minister Salve agreed that Indian leaders would visit the United States to view means of increasing power availability through energy efficient transmission and distribution.

- Secretary O'Leary dedicated the National Thermal Power Corporation's Energy Efficiency and Environmental Technology Center. This will open the door for identifying the cost-effective options for improving the efficiency and environmental performance of India's power sector. The Center will be supported by the U.S. Agency for International Development's U.S./Asia Environmental Partnership and the Global Environmental Facility through the Department of Energy. In addition, Jack Siegel, the Department of Energy's Acting Assistant Secretary for Fossil Energy, and Walter Bollinger, AID's India Director, signed a Protocol of Intent to conduct a variety of projects at the facility to improve efficiencies and reduce pollution.

- Secretary O'Leary and Minister for Non-Conventional Energy Krishna Kumar dedicated the Center for Energy and Sustainable Development at the Tata Energy Research Institute. This Center will help U.S. efficiency and renewable firms gain access to Indian markets.

It will particularly reach out to small and medium-sized businesses interested in joint ventures, and it will make use of the emerging international information highway to bring together potential partners.

III. ELECTRIC POWER PRODUCTION

Opportunities for Cooperation:

While India is demonstrating considerable interest in alternative sources of energy, such as energy efficiency and renewables, it remains dependant on traditional energy supply to meet the majority of its energy needs. India is expected to add tremendous electric power generation capacity, second in the world only behind China in total capacity increase.

India's electric power demand is expected to grow by 26,000 megawatts by 1995, 60,000 megawatts by 2000 and 140,000 megawatts by 2007. As a result, the nearly $200 billion of needed investment represents a great opportunity for the sale of U.S. power equipment and services, estimated at to be $25 billion. India is on a clear path towards privatizing power production. Seven "fast track" private power projects valued at $5.7 billion are well along in the approval process; six of these projects involve U.S. developers and equipment. Over 60 other private power deals are at various stages of development.

India is the world's fourth largest coal producer. Seventy percent of India's electric power is derived from coal. It is also projected that 70% of all future power projects through 2010 will be coal-based. By introducing clean coal technologies, the opportunity exists to reduce by over 90% emissions of sulfur dioxide and to reduce nitrogen oxides and carbon dioxide emissions by 50%. In addition, 23% of all electric power now produced in India is lost as a result of inefficient transmission and distribution systems. The opportunity exists to export U.S. equipment and services to reduce these losses.

The existing electric powerplants in India are aging and operate at efficiencies that are estimated at 28%, well below world standards. U.S. firms have an opportunity to offer equipment and services to modernize these plants to improve environmental performance and plant reliability and reduce the need for new plant additions.

Barriers:

- The ability to finance the needed electric capacity is in question and remains the major barrier. For example, at least initially, investors in plants must receive counter-guarantees from the Government of India in order to obtain financing. In addition, India's State Electricity Boards must be reformed to make projects easier to finance in the future.

  - Extended delay or failure to finance the seven "fast track" projects could not only discredit the well conceived Indian reform program, but it also would undermine

India's credibility as a favored country in an increasingly competitive market for international capital for power development in emerging markets.

- In the near term, international financiers are likely to require counter guarantees for at least some of the power projects currently under evaluation.

- For the longer term, the development of a commercially viable power sector and independent regulatory regime that assures predictable and fair governance may provide assurance of payment adequate to replace Indian counter-guarantees. It will take several years and considerable political will to achieve these reforms.

- Misperceptions exist about the commercial availability of clean coal technologies. Indian officials incorrectly believed that the technologies were neither proven nor economical.

- There is limited understanding of the specific actions that could be taken to improve the efficiency of powerplants or transmission and distribution systems. Pricing schemes (focusing only on capital costs) provide no incentive for improving efficiencies and thereby reducing electricity costs.

- Environmental standards are lax or nonexistent. As a result, no incentives exist for advanced technologies like those currently used in developed countries.

Accomplishments:

- The mission received nearly unanimous support from the Indian government and business community on the necessity of counter guarantees as a transitional strategy for financing private power projects. This survived considerable pressure from the political opposition before and during the mission.

- As a result of the mission, Indian officials advanced proposals on counter-guarantees for two large U.S.-led private power projects, Enron Corporation and AES, with combined value of nearly $2.75 billion). These counter-guarantees will enable these two projects to complete their financing packages and move into construction, providing momentum for the other five "fast track" projects. In addition, these initial successes combined with the Indian government's commitment to further reforms in power and finance will pave the way to move forward with the more than 60 other cooperative projects that are under various stages of development.

- Authoritative information provided by the U.S. delegation on the commercial viability of clean coal technologies cleared up misperceptions and paved the way for commercial tenders that will be based on these technologies. In addition, the Department of Energy announced technical support for site specific studies on integrated gasification combined cycle, paving the way for its commercial use in India.

- Elgin Industries and Spectrum Technologies (USA), Spectrum Washeries (India) and Jaya Foods, India, signed a consortia agreement to demonstrate coal washing technology. This is expected to lead to a $100 million U.S. private sector coal washing program in India.

- Spectrum Industries signed a power purchase agreement for a $245 million gas combined cycle power project.

- The Confederation of Indian Industries and National Independent Energy Producers of the U.S. signed an cooperative agreement to recommend reforms and oversee the progress made in implementing reforms necessary to finance private power projects in India.

- Secretary O'Leary signed a Statement of Intent to Cooperate in Fossil Energy, as well as Records of Meetings with the Ministries of Power and Coal, which opened the door to commitments by the U.S. and India to cooperate in a wide variety of fossil energy and power technologies consistent with sustainable development.

V. OIL AND GAS

Opportunities:

India's oil reserves are estimated at 5.8 billion barrels and gas reserves at 660 billion cubic meters. U.S. companies are examining participation in the growing opportunities to produce oil and gas in India, because of recent reforms that offer better terms than previously available. Nearly 30% of all of the natural gas produced in India is flared, which wastes a valuable resource and unnecessarily releases air pollution. The opportunity exists for U.S. industry to install equipment to utilize the gas now flared. For example, natural gas is under-utilized in the electric power sector, and this presents an opportunity for U.S. power companies and equipment vendors to be among the first to build and operate gas-fired powerplants.

The general lack of advanced exploration and production technology in India resulting in inefficient resource production and premature abandonment of oil reservoirs opens another important opportunity for U.S. technology deployment, particularly in the area of enhanced oil recovery.

Although India produces large quantities of coal in which large quantities of methane is likely trapped, no coal-bed methane is produced commercially. The opportunity exists to develop the methane resources from coal, producing a valuable energy resource while controlling this very reactive greenhouse gas.

Barriers:

- The best Indian oil fields have not been available to foreign firms until now.

- India has insufficient infrastructure to use natural gas. It does not have the technology necessary to convert natural gas to liquids, nor does it have pipelines to transport it to market.

- The lack of natural gas and availability of large quantities of coal in India have been a disincentive for using natural gas, especially for power production. Conditions were not right for financial institutions to provide the financial support needed for private power projects using gas.

- U.S. companies with access to advanced exploration and production technologies were not given the necessary incentives to conduct commercial ventures in India. In addition, bilateral agreements to exchange information on these technologies have never existed.

- Indian officials are uninformed about the potential value of recovering coal-bed methane, because the resource has never been characterized.

Accomplishments:

- India has recently opened up the exploration and production markets to allow full and open competition.

- U.S. experts provided information to Ministry of Petroleum and Natural Gas officials on U.S. technologies to convert natural gas to liquids. Ministry officials encouraged U.S. companies to initiate projects to utilize gas, especially gas now flared.

- U.S. power developers and financial experts provided insights on the requirements for financing gas-based private power projects.

- Information was exchanged on U.S. exploration and production technologies. U.S. companies were encouraged by Indian Ministry of Petroleum and Natural Gas officials to introduce the technologies in India. DOE officials agreed to begin bilateral information exchanges on a variety of advanced oil and gas technologies.

- U.S. industry experts and Government officials promoted the importance of recovering methane in coal seams. Indian officials agreed to work with U.S. industry and DOE to characterize India's coal-bed methane resources.

- Significantly advanced approval for counter-guarantee for Enron's gas combined cycle private power project valued at nearly $2 billion.

- Spectrum Industries signed a power purchase agreement needed to finance their gas combined cycle private power project valued at $245 million.

- Secretary O'Leary, Minister of Power Salve and Minister of Coal Panda signed a Statement of Intent to Cooperate in Fossil Energy. In addition, the Secretary signed Records of Meeting with Ministers Salve and Panda, as well as Minister of Petroleum and Natural Gas Sharma, to advance research, development and commercial cooperation in a wide variety of gas, oil, coal and electric power technologies.

VI. NUCLEAR SAFETY

The Presidential Mission achieved a notable success in obtaining agreement by the Indian government to open a nuclear safety dialogue between the two nations. Prime Minister Rao affirmed this agreement after meeting with Secretary O'Leary, and later Indian Atomic Energy Commission Chairman Chidambaram confirmed this understanding in a meeting with the Secretary in Bombay.

U.S. Nuclear Regulatory Commissioner E. Gail de Planque and the Department of Energy's Nuclear Energy Director Terry Lash worked out an initial program of cooperation with Dr. A. Gopala Khrishnan, Chairman of the Atomic Energy Regulatory Board (AERB). They agreed that the dialogue would initially involve an informal series of technical exchanges and visits, focusing on a short list of topics of mutual interest. The Indian and U.S. nuclear regulatory agencies would coordinate the effort, with participation by other agencies as appropriate.

The agreed-upon six areas of interest are:

1) fire safety;
2) safety analysis of early generation boiling water reactors;
3) training of regulatory personnel;
4) decontamination and decommissioning of nuclear facilities;
5) planning, evaluation and analysis of technical aspects of geologic disposal of waste; and
6) radiation protection and medical applications of radioactivity.

The dialogue on these subjects will be pursued on a reciprocal basis through:

- site visits to appropriate visits to appropriate facilities;
- meetings and seminars (whether or not held in conjunction with site visits); and
- exchange of documents.

The precise details and timing of the safety dialogue will be developed through regular contacts between U.S. Nuclear Regulatory Commission and AERB, including:

- In September or October: an Indian technical visit to the U.S. to discuss early boiling water reactors (with possible visit to Dresden 2 Reactor and Brookhaven National Laboratory), fire safety (visit to the Fermi laboratory or another facility with a fire event),

training (visit to the U.S. NRC's Chattanooga Training Center) and nuclear medicine (visit to National Institutes of Health).

- In November or December: a U.S. team visit to India (perhaps headed by U.S. NRC Chairman Selin) to discuss fire safety (visit to Narora powerplant); a reactor under construction (visit to Kaiga or Rajasthan powerplants); safety analysis (visit to India Gandhi Research Center near Madras, with side trip to Madras nuclear powerplant); and nuclear medicine (visit to Tata Memorial Hospital and radiation protection labs in Bombay).

- Secretary O'Leary and Chairman Chidambaram tentatively agreed to meet while attending the International Atomic Energy Agency General Conference in Vienna in September 1994 to assess progress.

INITIAL ACTION PLAN

1. ESTABLISH INDIA ACTION TEAM

By August 15, the Department will create a U.S. team comprised of representatives from government, non-governmental organizations and industry. This team would build on the success of the "pods" and the Indo-U.S. Summit: Cooperation for Sustainable Energy Development (Summit) break-out groups. Given the link between sustainable energy cooperation and intellectual property rights concerns, this directive should also address proper coordination with efforts to resolve intellectual property rights issues in the efforts for a broader science and technology agreement. The goals of this team would include:

- Implementing the recommendations of the *Indo/U.S. Summit: Cooperation for Sustainable Energy Development*, the strategy of the session entitled *Indo/U.S. Partnership for the Future* and the actions from the ministerial meetings;

- Monitoring progress made and taking action to support U.S. industry projects seeking approval in India;

- Develop and implement a resource mobilization strategy to support follow up work, including working on possible assistance from the Departments of State and Commerce, the Agency for International Development and its U.S./Asia Environmental Partnership, the Environmental Protection Agency, the Trade and Development Agency, the Export-Import Bank and the Overseas Private Investment Corporation.

- Acting on the request to work with Indian businesses, the Confederation of Indian Industries and the Tata Energy Research Institute on cooperative programs to assist in

tailoring total quality management tools and techniques to India for managing their move toward privatization.

- Identifying new areas for cooperation and promotion of sustainable energy development, global environmental protection and Indo/U.S. trade;

- Developing a specific program to protect the Taj Mahal from further environmental degradation through a cooperative effort between the Environmental Protection Agency, the Department of the Interior, the Department of Energy, the White House and the Indian government;

- Establishing links to counterparts in India;

- Identifying areas for joint research and development cooperation for sustainable energy development; and

- Providing a process for identifying and removing barriers to sustainable energy development in both the U.S. and India with the intent of exporting technology and know-how.

The team members will develop an organizational structure by continuing and expanding the "pods." The team will prepare vision statements, benchmarks for progress, measurable goals, desired outcomes and specific action plans.

ACTIONS:

- Appoint action team leader by August 5, 1994.

- Identify and establish team and sub-team members (including interim leadership) and convene first team meeting by August 15, 1994;

- Initiate efforts to coordinate and expedite resolution of intellectual property rights concerns by September 15, 1994.

- Draft mission statements and recommend priorities by October 15, 1994;

- Finalize mission statements and action plan by December 1, 1994.

- Begin implementation by January 1, 1995.

2. *INDO/U.S. SUB-COMMISSION*

Based on the recommendations coming out of Secretary O'Leary's meeting with Prime Minister Rao, the purpose for this sub-commission to the Indo/U.S. Commission would be to monitor cooperation in the energy sector and implement the bilateral energy consultations signed during the mission. This sub-commission, as described by Prime Minister Rao, would assist in sorting out problems and removing administration bottlenecks to expedite projects in the energy sector.

This sub-commission is likely to be co-chaired by Secretary O'Leary and Minister of Power Salve, with representation from other relevant energy ministries. The Department of Energy would provide a secretariat for the sub-commission to serve as the focal point for coordination with other U.S. government agencies.

ACTIONS:

- Draft a protocol document by October 1, 1994.
- Obtain necessary approvals from other relevant U.S. agencies and negotiate text with Government of India by date to be determined.
- Sign protocol at next meeting between Secretary O'Leary and Minister Salve.

3. *WHITE HOUSE SUPPORT*

The Department will seek White House support for follow-up to the Presidential Mission on Sustainable Energy and Trade. The first action would be a Presidential directive to all relevant departments and agencies to participate actively in implementation and follow-up actions.

The agencies might include, among others, the Department of State, Energy and Commerce and the Agency for International Development, the Environmental Protection Agency, the Overseas Private Investment Corporation, the Export-Import Bank, the Trade and Development Agency and the U.S. Trade Representative as well as the National Security Council, the National Economic Council and the Office on Environmental Policy.

ACTIONS:

- Draft and propose text for a Presidential directive by September 1, 1994.

APPENDIX 1.

OFFICIAL DOCUMENTS SIGNED ON MISSION

1. Record of Meeting on Sustainable Production of Power in India

2. Summary of Discussions between the Ministry of Non-Conventional Sources (India) and the Department of Energy (U.S.)

3. Record of Meeting on Sustainable Development and the Use of India's Natural Gas and Petroleum Resources

4. Record of Meeting on Sustainable Development on India's Coal Resources

5. Memorandum of Understanding between the Department of Energy (U.S.) and Ministry of Power (India)

6. Joint Statement of Intent between the Department of Energy (U.S.) and the Ministry of Non-Conventional Energy Sources (India)

7. Joint Statement of Intent between the Department of Energy (U.S.) and the Ministry of Coal (India) to Cooperate in the Field of Fossil Energy

8. Joint Statement of Intent between the Ministry of Environment and Forests (India) and the Department of Energy (U.S.) to Cooperate in Environment Enhancing Energy Technologies

9. Joint Statement of Intent between the Department of Energy (U.S.) and the Ministry of Power (India) to Cooperate in the Field of Energy Efficiency

10. Protocol of Intent between the Department of Energy (U.S.), Agency for International Development (U.S.) and the Ministry of Power (India) and the National Thermal Power Corporation (India)

RECORD OF MEETING ON SUSTAINABLE PRODUCTION OF POWER IN INDIA

Secretary of Energy of the United States, Hazel R. O'Leary and Minister of Power of India, N.K.P. Salve, met on July 11, 1994, in New Delhi, India. The objective of the meeting was to explore opportunities for collaboration between the United States and India and to set measurable goals for each country to ensure that India's electric power industry will develop in a manner that will sustain India's economic growth while minimizing the environmental impact.

It was agreed that:

- Private power projects are the desirable mechanism to introduce improved technology and foreign capital into India's electric power expansion program. Therefore, the process of obtaining approvals for private power projects needs to be expedited. In that regard, counter guarantees for these initial projects must also be expedited. In the longer term, processes must be put in place which will allow private power projects to be financed without the need for counter guarantees. In that regard, the U.S. experience was offered.

- The United States and India will expand their cooperation in sustainable energy technology by:

  - signing the Memorandum of Understanding on Bilateral Energy Consultations;

  - developing concepts and sharing of experiences for improving the energy efficiency of the power sector and end-use efficiency in India;

  - expanding the exchange of technical personnel to gain experience in each country's energy and environmental programs, policies, and technologies;

  - exchanging information on improving the interconnection of the Indian power grid and improving the energy efficiency of transmission and distribution systems in India.

  - exchanging information on the environmental, economic, and technical aspects of hydroelectric power production with the U.S. power marketing administrations, research and development institutions and their Indian counterparts.

  - introducing clean coal technologies into the Indian power industry at pre, as well as post, combustion stages for coal combustion technologies, fly ash collection and utilization, and other advanced power systems.

It was also agreed that official follow-on meetings will be held on at least a semi-annual basis and at the Cabinet level on an annual basis, to review the progress made on these and other areas of common interest.

Hazel R. O'Leary

N.K.P. Salve

13.7.94

NON-CONVENTIONAL ENERGY SOURCES AND THE US DELEGATION LED BY THE SECRETARY OF ENERGY

Ms. Hazel R. O'Leary, US Secretary of Energy, met Shri S. Krishna Kumar, Minister of State for Non-Conventional Energy Sources & Agriculture, on 12th July, 1994, alongwith their respective official and business delegations. Arising out of the common outlook of both countries on energy, environment and sustainability, they emphasised the need to strengthen cooperation in the field of renewable energy. They felt that the main purpose of the proposed cooperation should be to foster closer linkages and contacts between scientific and technological institutions, facilitate commercialisation, and encourage investments for renewable energy project development. The cooperation should provide the framework for exchange of information and personnel, joint projects, licensed production in India, joint ventures, increased trade between the two countries, and opening up of opportunities for financing and private investments.

2. It was agreed by the two sides to sign a Joint Statement of Intent for cooperation in the field of renewable energy, at the conclusion of the visit of the US Secretary of Energy to Delhi. It was also agreed to set up a Joint Committee to plan and coordinate cooperation in this area.

3. The following specific areas of collaboration were suggested by the US side, which could form the first tasks under the proposed programme of cooperation :-

- Advanced biomass gasification, where the US experience

in gasification technology for woody biomass and agro-industrial residues such as bagasse will be shared, using the 'twinning' approach, and the applicability of these particular systems to the remote energy needs in India will be explored.

- Village electrification, using the experience with Brazil and Mexico in joint project implementation, with a view to leveraging multi-lateral funding for such projects in India.

- Joint test programme to evaluate the economic feasibility of solar photovoltaic concentrators, for grid-connected power generation.

- Standardisation and reliability testing to achieve full compatibility of test standards for wind turbines, solar photovoltaics, solar thermal systems, etc., and to ensure that reliability problems that have already been identified in the US are not duplicated in the deployment of systems in India.

A suggestion was made regarding inclusion of renewable energy based power components in large conventional power stations being planned, so that the financing and economics of the whole package becomes attractive. The example of solar assisted combined cycle plants was discussed. It was felt that a few such joint projects could be developed.

4. In addition, the Indian side indicated interest in the following areas :

- Joint development and commercialisation of low-speed wind turbines.

- Demonstration of advanced biomass electric conversion technologies, including state-of-the-art boilers and turbo-generators for optimal cogeneration, and producer gas fired engines.

- Solar thermal power generation, especially the US experience in operation, maintenance and grid interfacing of solar thermal power plants in California.

5. Some other specific areas of interest to India include :

- Cost-effective thin film solar photovoltaic technologies, and high efficiency power conditioning equipment.

- US experience on policy measures and regulatory mechanisms to stimulate renewable energy development.

- Evaluation of options for project financing to secure maximum international assistance, institutional finance and private investment for market based renewable energy systems.

- Ocean thermal energy conversion.

- Energy recovery from municipal and industrial wastes.

- Alternate fuels for transportation.

- Solar refrigeration.

6. The need for intensive scientific cooperation in research and development and joint technology development programmes in the renewable energy sector were emphasised to bring about technological upgradation as well as improvement of efficiencies and reduction of costs of promising technologies.

7. It was agreed to have broad-based cooperation between the Solar Energy Centre and the National Renewable Energy Laboratory of the US, including exchange of scientific information and test data. A joint programme of testing and evaluation will also be developed with the Hybrid Test Centre being established at NREL.

8. The Indian side informed the US side that a Special Cell has been set up in the Ministry of Non-Conventional Energy Sources to facilitate joint ventures in renewable energy. The Ministry has taken up with the World Bank issues pertaining to facilitating early utilisation of their lines of credit to IREDA. The Indian side also informed that certain matters pertaining to rationalisation, removal of anamolies and interpretation concerning custom tariffs for renewable energy equipment are being discussed with the concerned authorities.

9. The US Department of Energy will send a letter confirming the identified areas, after which detailed modalities of cooperation between the two sides will be worked out.

Signed in duplicate at New Delhi, India, this 13th day of July 1994.

For the Department of Energy of the United States of America :

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

For the Ministry of Non-Conventional Energy Sources of the Republic of India :

(S. KRISHNA KUMAR)
MINISTER OF STATE

RECORD OF MEETING ON SUSTAINABLE DEVELOPMENT AND USE OF INDIA'S NATURAL GAS AND PETROLEUM RESOURCES

Secretary of the United States Department of Energy, Hazel R. O'Leary, and Minister of State with Independent Charge for Petroleum and Natural Gas, Satish Sharma, met on July 11, 1994, in New Delhi, India. The objective of the meeting was to explore opportunities for collaboration between the United States and India and to set measurable objectives for each country to ensure that the natural gas and petroleum resources will be produced and utilized in a manner that will sustain India's environment while allowing for its economic growth. The following is a record of the meeting.

They agreed that:

- To assist India in assuring that its energy resources are used most efficiently, cleanly, and economically, U.S. assistance would be provided to the Indian energy and environmental Ministries to develop a sustainable energy strategy for India. This would include efforts to explore measures to reduce gas flaring and use this gas in demand centers.

- Advanced natural gas and petroleum exploration, production, and upgrading technology transfer from the United States to India would allow for the more efficient, environmentally sound, and economic production and use of the natural gas and petroleum resources in India.

- The most effective way to transfer technology from the United States to India is through private sector ventures between companies in India and the United States.

- To promote private sector technology transfer, decisions on natural gas and petroleum projects now being considered in India should be accelerated.

- Transfer of technology will also result from signing the Memorandum of Understanding on Bilateral Energy Consultations and the Statement of Intent to Cooperate in the Field of Fossil Energy and implementing Government-to-Government and industry-to-industry programs under those agreements.

The following areas would be the initial focus of the technology transfer program. In each area, private sector initiatives will be promoted as the highest priority. In addition, these Government-to-Government information exchanges will be initiated:

(1) Energy efficient technologies in all areas.

(2) Oil and gas exploration:

(a) technologies to develop and exploit marginal fields/abandoned fields;

(b) development in deep sea areas and sub–sea systems;

(c) development of thin oil rims;

(d) heavy oil development;

(e) quality improvement in seismic data acquisition;

(f) skid mounted or floating systems for extraction of higher fractions from natural gas/conversion of middle distillates;

(g) insitu combustion technology;

(h) thermal EOR (steam) technology;

(i) technology for development of very tight formations; and

(j) application of "FRACTALS" techniques for reservoir simulation and management.

(3) Refining

(a) It is noted that the United States has technologies to improve cracking to increase proportion of higher value distillates and reduce residues. This will be extremely useful yields of lighter products from crude oil. Also required in the context of our need to revamp the existing FCCs.

(b) In addition, latest technology for the manufacture of high viscosity lube oi through hydro–processing.

(4) Energy modelling: Where techniques for energy modelling including sector–wis modelling for energy planning in the country, could be advanced throug exchange of information, experts, and even training.

(5) Financial restructuring of the Public Sector Units' (PSUs) in India increas opportunities for financial services like advisors in market restructuring and acce

to overseas capital markets.

It was also agreed that follow-on meetings on at least a semi-annual basis will be held to review progress made on these and other areas of common interest.

Hazel R. O'Leary
Secretary of Energy

Satish Sharma
Minister of Natural Gas and
Petroleum and Natural Gas Resources

RECORD OF MEETING

ON

SUSTAINABLE DEVELOPMENT ON INDIA'S COAL RESOURCES

Secretary of the United States Department of Energy, Hazel R. O'Leary, and the Indian Minister of Coal, Ajit Kumar Panja, on July 11, 1994, in New Delhi, India, to undertake bilateral discussions on the subject of collaboration of sustainable energy development in India. The following is a record of that meeting.

They agreed that :

* Coal washing will remove impurities before the coal is combusted, thereby reducing air pollution, reducing transportation needs and costs, and improving boiler performance and efficiency which in turn reduces carbon dioxide emissions.

* The United States leads the World in coal washing and beneficiation technology and that the need for steam coal washeries in India is high for commercial projects by U.S. companies under the build, own, and operate (BOO) model; or under the build, own, operate, and trade (BOOT) model.

...2/-

* Clean coal technologies will reduce pollution and increase the efficiency of using coal. Therefore, Research and Development collaboration between the Indian Ministry of Coal and the U.S. Department of Energy should be expanded in the areas of advanced coal beneficiation, coal gasification, coal-bed methane recovery and other clean coal technologies upon signing of the Fossil Energy Protocol of Intent.

* Partnerships between United States and Indian business and Government will accelerate the commercial use of clean coal technologies in India. A working group of U.S. and Indian government and private sector representatives will be created with the objectives of transfering advanced coal technology to India and identifying commercial project opportunities for U.S. companies in India.

* There is interest in India for coal-bed methane recovery to protect the environment, produce a valuable energy resource and to protect coal mines. U.S. companies with expertise in coal-bed methane recovery will be encouraged to pursue commercial projects with the Ministry of Coal.

...3/-

* U.S. coal producers and mining equipment manufacturers will be encouraged to work with the Ministry of Coal of India to characterize and develop deep coal deposits in India through underground coal mining techniques.

* Regulatory and other barriers to investment will inhibit the use of advanced coal technologies in India. Therefore, these barriers will be reviewed and dealt with by the Ministry of Coal. U.S. companies were urged to bring to the attention of the Ministry specific problems they confronted.

At a follow-on meeting between the U.S. Department of Energy, Hazel R. O'Leary, Indian Minister of Coal, Ajit Kumar Panja and private sector representatives from the U.S. Presidential Mission on sustainable Development, it was agreed that :

* The Indian Ministry of Coal be contacted by U.S. companies having an interest in building coal washing facilities to obtain information on India's coal washing plants.

...4/-

* The Ministry of Coal will work closely with U.S. Department of Energy, the U.S. - Asia Environmental Partnership (U.S.-AEP) and U.S. companies to promote Indo-U.S. joint ventures established to develop commercial coal preparation projects.

* The U.S. Department of Energy, with assistance from the U.S. - Asia Environmental Partnership, will help U.S. companies mobilize public and private financing for coal preparation project proposed under the BOO and BOOT models.

* The Indian Ministry of Coal will assist any U.S. company who has problems obtaining firm commitments to transport coal in India.

* The Indian Ministry of Coal will accelerate their review of allowing the cost of coal washing to be passed through to end user.

* Although much progress has been made to reduce the import tariffs on coal preparation and coal-bed methane recovery test equipment, the Ministry of Coal will review the tariffs to determine if they should be further reduced.

...5/-

* The U.S. Government and Industry will work with India to assess the potential of coal-bed methane recovery from deep seams.

It was also agreed that a meeting between Indian Ministry of Coal and U.S. Department of Energy officials to review the progress made on these and other issues of common interests would be held on a semi-annual basis.

New Delhi, India, 13th July, 1994.

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

(AJIT KUMAR PANJA)
MINISTER OF STATE FOR COAL

FOR THE MINISTRY OF COAL OF THE REPUBLIC OF INDIA

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE GOVERNMENT OF THE UNITED STATES OF AMERICA

(DEPARTMENT OF ENERGY)

AND

THE GOVERNMENT OF INDIA

(MINISTRY OF POWER)

PREAMBLE

The Government of India, Ministry of Power hereinafter called Ministry of Power and the Government of United States of America, Department of Energy, hereinafter called the Department of Energy desirous of conducting bilateral energy consultations have agreed as follows:

ARTICLE I

Within the framework of common interest and mutual benefit of both countries, the U.S. Department of Energy and the Ministry of Power have agreed to establish a sub-ministerial working group on energy which will conduct energy consultations between the two agencies (hereinafter referred to as the "Group"). The purpose of this group is to enhance the understanding of energy issues and to promote the exchange of information on energy policies, programmes and technologies by consultations.

ARTICLE II

The objective of this group include consultations:

A) To discuss current and prospective energy developments in both countries, the Asia region and the world at large.

B) To facilitate an exchange of information and assessments on energy demand and supply forecasts for the two countries.

C) To exchange views on energy and related environmental policies, including global climate change, and to discuss programmes of both countries relating to the exploration, development, management, and environmental concerns of major energy resources including renewable energy resources and to the efficient and environmental responsible transport and use of energy.

D) To review and exchange information on energy technologies including renewable energy technologies and applied energy research and development.

ARTICLE III

For the purpose of promoting closer contacts and mutually beneficial consultations, the arrangements for the group's meeting will be as follows:-

A) The group will consist of senior sub-ministerial officials from the U.S. Department of Energy and

JOINT STATEMENT OF INTENT
BETWEEN
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND
THE MINISTRY OF COAL OF THE REPUBLIC OF INDIA
TO COOPERATE IN THE FIELD OF FOSSIL ENERGY

Whereas, the Department of Energy of the United States of America (DOE) and the Ministry of Coal of the Republic of India, hereinafter referred to as the Participants, have a mutual interest in exchanging experience and views on opportunities for expanded fossil energy utilization, including clean coal and coal-bed methane technologies, and in pursuing collaboration between their two countries in this area;

Whereas, the Participants recognize the contribution of fossil fuel technologies, including clean coal and coal-bed methane recovery and utilization technologies, to fuel diversity, to enhance mutual environmental protection and energy security, and to expand opportunities for international trade; and

Whereas, the Participants will mutually benefit from collaboration in the deployment and use of fossil fuel technologies.

.....2/-

Whereas, the Participants recognize that implementation of any collaborative fossil energy activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, under negotiation, and of a fossil energy implementing arrangement between the Participants.

The Participants declare their intention to cooperate in a manner which will facilitate joint activities and market deployment of fossil energy technologies in an environmentally responsible way. These intended joint activities may include, but will not be limited to:

(1) Consultations by senior program officials to permit joint planning of joint projects in which participating organizations agree to share the tasks, the costs, or both. Each such project shall be the subject of a separate project agreement;

(2) Exchange of publicly available technical and economic data, including data on cost-effective clean coal, coal-bed methane recovery, and coal mining health and safety technological options;

...3/-

the Ministry of Power. Other agencies and entities may be invited to participate in the consultations as appropriate.

B) The U.S. Department of Energy and the Ministry of Power will each appoint an official who will make preparations for the meeting and who will have responsibility for maintaining mutual contact during the time when meetings are not held.

ARTICLE IV

The work programme of the group will be guided by the following procedures:

A) The meeting will be held periodically, usually on an annual basis, alternately in the United States and India.

B) Special meetings may be held if both the U.S. Department of Energy and the Ministry of Power so decide.

C) The dates of the meetings will be determined at least one month in advance pursuant to discussions between the U.S. Department of Energy and the Ministry of Power.

D) The subjects to be discussed at the meetings will be mutually determined by the U.S. Department of Energy and the Ministry of Power.

ARTICLE V

These consultations will be held in accordance with the laws and regulations in the United States and India.

ARTICLE VI

These consultations will not affect existing arrangements in place or under discussion between the U.S. Government and the Government of India organisations, or involving the U.S. Department of Energy and the Ministry of Power.

ARTICLE VII

Consultations under this Memorandum of Understanding shall cease five(5) years after the date of signature, unless the U.S. Department of Energy and the Ministry of Power decide in writing that continued consultations would be beneficial.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994.

For the Department of Energy
of the United States of America

(HAZEL R. O' LEARY)
SECRETARY OF ENERGY

For the Ministry of Power
of the Govt. of India

(N.K.P. SALVE)
MINISTER OF POWER

13.7.94

JOINT STATEMENT OF INTENT

BETWEEN THE

DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

AND THE

MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES

OF THE REPUBLIC OF INDIA

The Department of Energy of the United States of America and the Ministry of Non-conventional Energy Sources of the Republic of India (The "Energy Agencies") have reached general agreement on the following elements which they intend to include in an Implementing Arrangement which will be subject to the Agreement between the Government of the United States of America and the Government of India on Cooperation in Science and Technology, which is currently under negotiation. This proposed Implementing Arrangement provides for cooperation in the field of renewable energy and will be finalized upon entry into force of the aforementioned US-India Science and Technology Agreement:

1. The Energy Agencies intend to facilitate and establish cooperative activities in the field of renewable energy research, development and commercialization that are of programmatic benefit to the Energy Agencies; such activities are to be conducted on the basis of mutual benefit to the two countries, equality and reciprocity;

2. Cooperation in accordance with the proposed Implementing Arrangement may include exchange of personnel, samples, materials, instruments and components for testing, and scientific and technical information, as well as the organization of and participation in seminars and projects and such other specific forms of cooperation as may be mutually agreed by the energy agencies;

3. The energy agencies intend to establish a Joint Committee on Scientific Cooperation in Renewable Energy (Joint Committee), to meet alternately in the United States and India; this Joint Committee is to plan and coordinate cooperation in renewable energy;

4. If the Co-Chairmen of the Joint Committee decide that a joint project shall be established under the proposed Implementing Arrangement, a project agreement shall be executed which shall include detailed provisions for carrying out the joint project to which it applies and cover such matters as technical scope, exchange of proprietary information, patents, project management, exchange of equipment, and personnel, total costs, cost sharing, and project schedule;

5. Any exchange of personnel shall be mutually agreed in advance by the Energy Agencies through an exchange of letters and, in each case, the Energy Agencies shall ensure the selection of adequate personnel with skills and competence necessary to conduct the activities planned;

6. The Energy Agencies recognize that implementation of any renewable energy activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, under negotiation, and of a renewable energy Implementing Arrangement between the Participants.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994.

FOR THE DEPARTMENT OF ENERGY
OF THE UNITED STATES OF AMERICA

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

FOR THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES OF THE REPUBLIC OF INDIA:

(S.KRISHNA KUMAR)
MINISTER OF STATE

(3) Joint technical evaluation of fossil energy technology parameters, including advanced clean coal utilization parameters;

(4) Technology demonstrations, including demonstration of the use of state-of-the - art technologies for methane utilization;

(5) Exchange visits to mutually agreed upon U.S. and Indian commercial and clean coal technology research, development, and demonstration program facilities;

(6) Training and internship program support for personnel in related fossil energy technologies to strengthen related human resources and institutional infrastructure and facilitate joint government/industry activities;

(7) Joint development of technical assistance programs to facilitate industrial partnerships between fossil energy industries in the U.S.and India;

....4/-

(8) Concluding appropriate agreements for planning, screening studies, design, financing, constructing, and operating clean coal technology demonstration plants or research and development projects.

Activities undertaken under this statement of intent may be implemented by the joint efforts of the Participants or their designees. The United States Department of Energy intends that the Office of Fossil Energy, in cooperation with the U.S. Agency for International Development, its bilateral mission in India, and the United States Asia Environmental Parternship, will implement this cooperation. The Indian Ministry of Coal intends that the agencies designated by it will implement this cooperation. Neither side will implement this Joint Statement until after the conclusion of an Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology.

.....5/-

All costs resulting from this intended cooperation shall be borne by the Participant that incurs them, unless otherwise agreed to in writing.

New Delhi, India, 13th July,1994.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

FOR THE MINISTRY OF COAL OF THE REPUBLIC OF INDIA

JOINT STATEMENT OF INTENT

BETWEEN THE

MINISTRY OF ENVIRONMENT AND FORESTS

OF THE REPUBLIC OF INDIA

AND THE

DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

TO COOPERATE IN ENVIRONMENT ENHANCING ENERGY TECHNOLOGIES

WHEREAS, the Department of Energy of the United States of America (DOE) and the Ministry of Environment and Forests (MOEF) of the Republic of India, hereinafter referred to as the Participants, have a mutual interest in working together and consulting to facilitate planning, development and implementation of energy technology cooperation projects in India that result in improved environmental attributes, reduction in net emissions of greenhouse gases, and improved production technology, and in pursuing collaboration between their two countries in this area.

WHEREAS, the Participants recognize that enhancing mutual environmental protection, particularly controlling greenhouse gas emissions to limit potential adverse climate change impacts, requires a global solution, to which both our countries have opportunities to make significant but differential contributions.

WHEREAS, the Participants recognize that many methods and technologies that limit greenhouse gas emissions contribute also to economic development and the control of local and

regional environmental problems, and that cost-effective, world-wide greenhouse gas emission reductions may be achieved by encouraging such reductions where responsive solutions are available at least cost with possible financial and technical assistance from individuals and organizations.

WHEREAS, the Participants recognize that the Framework Convention on Climate Change, Agenda 21, and other international agreements, to which both our countries are signatories, encourage countries to implement cooperative, mutually voluntary projects, particularly technology cooperation projects as an important means to accelerate progress along a sustainable development path and maintain strong and sustainable economic growth.

WHEREAS, the Participants recognize that implementation of any environment-enhancing energy activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, to be agreed between the United States and India.

WHEREAS, the Participants will mutually benefit from collaboration in the deployment and use of environment enhancing and greenhouse gas emission reduction technologies.

1.) THE PARTICIPANTS declare their intention to cooperate in a manner which will facilitate bilateral activities and market deployment of environment enhancing energy technologies, particularly greenhouse gas-reducing technologies. These intended bilateral activities, to be carried out under a Memorandum of Understanding may include, but are not to be limited to:

(A) Consultations by senior program officials to permit planning of bilateral projects and to facilitate agreement by participating organizations on the opportunities for and solutions to the barriers to development of cooperative activities, including integrated resource planning, to promote sustainable development;

(B) Bilateral technical evaluation of projects that are likely to meet the criteria for project selection being developed by the Conference of the Parties of the United Nations Framework Convention on Climate Change, including development of a model statement of acceptance by India for technology cooperation projects;

(C) Exchange of publicly available technical and economic data, including data on cost-effective greenhouse gas emission reduction, improved energy efficiency, and commercial energy technological options, that enhance the environment and contribute to achieving sustainable development;

(D) Bilateral development of information systems, including application of telecommunications, computer systems and support systems such as internet, to foster new technology cooperation initiatives and to support information requirements on energy technology cooperative projects;

(E) Bilateral support of other potential and existing technology cooperative and technology transfer projects beneficial to both our countries' non-government and commercial interests; and

(F) Training and internship program support for personnel in related energy technologies to strengthen related human resources and institutional infrastructure and facilitate bilateral government/industry activities.

2.) THE PARTICIPANTS declare their intention that a Memorandum of Understanding to implement this Joint Statement of Intent will provide that all costs resulting from this cooperation shall be borne as mutually agreed.

3.) The MOU to implement this Joint Statement will not take effect until after the conclusion of an Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994

For the Ministry of Environment and Forests of the Republic of India:

(KAMAL NATH)
MINISTER OF STATE

For the Department of Energy of the United States of America:

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

JOINT STATEMENT OF INTENT

BETWEEN

THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

AND

THE MINISTRY OF POWER OF THE REPUBLIC OF INDIA

TO COOPERATE IN THE FIELD OF ENERGY EFFICIENCY

WHEREAS, the Department of Energy of the United States of America (DOE) and the Ministry of Power of the Republic of India, hereinafter referred to as the Participants, have a mutual interest in exchanging experience and views on opportunities for improving energy efficiency, including demand-side management and cogeneration, and in pursuing collaboration between their two countries in this area; and

WHEREAS, the Participants recognise the contribution of energy efficiency technologies, including demand-side management and cogeneration, to enhancing mutual environmental protection and energy security, and expanding opportunities for international trade;

WHEREAS, the Participants recognise that implementation of any collaborative energy efficiency activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, under negotiation, and of an Energy Efficiency Implementing Arrangement between the Participants.

The Participants declare their intention to cooperate in a manner that will facilitate joint activities and commercial development and deployment of environmentally sound, energy-efficient technologies. These intended joint activities may include:

(1) Joint technical evaluations of the potential for electrical and thermal end-use energy efficiency, including integrated resource planning in utilities;

(2) Technology demonstrations, including pilot demonstration projects in demand-side management, cogeneration and other state-of-the-art technologies for efficient energy utilization;

(3) Joint development of information exchange networks that permit availability, accessibility and acceptability of high quality energy technology, policy and regulatory information;

(4) Training and internship programme support for personnel in related energy efficiency technologies to strengthen related human resources and institutional infrastructure and facilitate joint government/industry activities in market conditioning and standards setting as well as in science and technology;

(5) Sharing experience in defining and implementing national and state government roles in supporting technology innovation and deployment;

(6) Technical assistance programmes to promote the development of energy service companies established through partnerships between U.S. and Indian public and private sector entities;

(7) Concluding appropriate agreements for planning, design, financing, constructing and operating cogeneration technology demonstration plants or

energy efficiency technology applicantion projects; and

(8) Coordination with multilateral development banks in the design, development and financing of energy efficiency programmes and projects.

Implementation of above collaborative energy efficiency activities, listed above, is pursuant to and contingent upon the successful conclusion of an agreement between the Government of the Republic of India and the Government of the United States of America on Cooperation in Science and Technology. The Participants intend the activities undertaken under this Joint Statement of Intent to be coordinated by the joint efforts of the designees of the Participants.

All costs resulting from this intended cooperation shall be borne by the Participants that incur them, unless otherwise agreed to in writing.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994.

For the Department of Energy
of the United States

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

For the Ministry of Power
of the Republic of India

(N.K.P. SALVE)
MINISTER OF POWER

13/7/94

PROTOCOL OF INTENT
BETWEEN
THE UNITED STATES DEPARTMENT OF ENERGY AND THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
AND
THE MINISTRY OF POWER OF THE GOVERNMENT OF INDIA AND THE NATIONAL THERMAL POWER CORPORATION LIMITED, INDIA

1.0 *It is the intent of the U.S. Department of Energy (USDOE) and the National Thermal Power Corporation Limited of India (NTPC) to establish long term technical cooperation programmes aimed at improving the efficiency of power generation and attainment of sustainable energy development in India.*

2.0 NTPC, *the largest power utility in India, with over* 14500 MW *of operational thermal capacity, has established a* ***Centre for Power Efficiency and Environmental Protection*** *at its Research and Development Complex in NOIDA, India, which the* USDOE *and the U.S. Agency for International Development* (USAID) *intend to support through technical assistance and transfer of advanced leading edge technology for improvement in performance of the Indian Power Sector.*

3.0 *It is also the intent of* USDOE *and* USAID *to help introduce new and qualitatively better generation technologies through association with the* Ministry of Power/NTPC, *with a view to bringing down the greenhouse gas emissions per energy unit generated and also to reduce environmental impact and degradation.*

4.0 *It is intended that the areas of mutual cooperation and interests for technical assistance and technology transfer would be identified and reviewed from time to time so as to achieve maximum benefits to the Indian Power Sector.*

(Jack Siegel)	(W. Bollinger)	(R.K.Nair)	(Rajendra Singh)
USDOE	USAID	MOP	NTPC

(Signed on 13th Day of July 1994 at New Delhi in Presence of Ms. Hazel R. O'Leary, Secretary of the United States Department of Energy and Mr. R. Vasudevan, Secretary, Ministry of Power, Government of India)

APPENDIX 2.

SESSION SUMMARY: INDO/U.S. PARTNERSHIP FOR THE FUTURE

A round-table session on "Partnerships for a Sustainable Energy Future" produced an action plan supported by government representatives, businesses and environmental groups. The group's plan will:

1. Develop an action plan for "twinning" demonstration projects linked to the U.S. Climate Change Action Plan. The plan relies on voluntary industry efforts to reduce greenhouse gas emissions and the commercialization of new technologies. Both of these elements could be "twinned" with Indian industry counterparts through technology demonstrations, partnerships, and technology transfer including management, process, and policy innovations in cooperation with government and non-government organizations (NGO).

2. Establish an efficiency and renewable energy task force to accelerate the utilization of efficiency and renewable energy technologies drawing on relevant U.S. experience. Renewable and efficiency endeavors should be focused on the electric power, industrial, and transport sectors.

   a. Charge the task group with identifying barriers to penetration and recommending remedial actions. The import duty structure which adversely affects renewable energy technologies (due to their capital intensive nature) and the development of markets to scale-up manufacturing of photovoltaics, wind, cogeneration turbines, and batteries also needs to be reviewed.

   b. Charge the task group to evaluate alternative mechanisms for large block power purchases targeted from renewables, conservation, solar-assisted gas-fired plants, and other hybrid renewable-fossil fuel plants and demand-side management demonstrations. These alternatives should include an examination of incentives for energy service companies particularly integrated energy services. Identify and evaluate model projects for implementation by NGOs and industries facilitated by State Electricity Boards.

   c. Charge the task group with ensuring that the availability of fuel to the poor is not adversely affected by the development of renewable resources, notably biomass.

3. Bilaterally develop an action plan drawing upon each country's experiences to explore strategies for improving the ability of Indian utility systems to meet financial, environmental, and consumer needs through improved planning, operations, management,

and financial accounting as well as the development of a regulatory structure that integrates tariff-making, integrated resource planning, and public participation.

a. Form a bilateral team to produce a model integrated resource planning system tailored to Indian conditions with an explicit implementation strategy.

b. Form a bilateral team to develop market promotion strategies for grid-connected industrial cogeneration systems.

c. Form a bilateral team for the development of demand-side management programs and strategies in Indian utilities to reduce peak capacity shortages and improve end-use efficiency.

d. Form a bilateral team to develop and programs for the reduction of transmission and distribution losses.

e. Consider forming a team to work with State Pollution Control Boards to monitor emissions and compliance with pollution control standards.

4. Bilaterally develop an action plan drawing upon each country's experiences to explore strategies for the reduction of natural gas flaring and for the capture and utilization of coal-bed methane. Engage in joint strategic studies on integrated resource options for India including oil and gas exploration and development, gas importation, efficiency, renewable energy and other clean combustion technologies. These studies should, in particular, relate to India's goal of installing 2,000 MW of renewable energy, and they include the environmental implications and costs of all alternatives. Particular attention should be paid to the problem of fly ash disposal.

5. Establish a task force that will focus on the delivery of reliable, safe, environmentally sound and economical power to rural consumers including the promotion of viable decentralized generation (with distribution), through the private sector, jointly, and/or through cooperatives.

6. Continue an active dialog between the financial community members of the U.S. business delegation and their Indian business counterparts on the subject of financial incentives for sustainable development. Further, the U.S. financial community members will return to India within six months and meet with the Confederation of Indian Industry's Committee on Private Industry Participation in the Power Sector.

7. Create an Indo/U.S. Committee on the Energy Aspects of Sustainable Development within the framework of the existing Indo/U.S. Joint Commission to include membership from government, industry, and NGOs. The committee will assemble bilateral teams for

follow-on action items 1-5 who will develop and report a plan of work within six months.

In addition, the session on *Indo/U.S. Partnership for the Future* brought out a number of valuable observations, including:

- The importance of broadening the composition of delegations and follow-on teams to include representatives of state governments from both India and the U.S.;

- The importance of ensuring near-term success to sustain this new partnership, which could be accomplished by targeting an existing project or by identifying model projects for start-up cost-sharing funds by government;

- The importance of ensuring that any follow-on actions are generally bilateral with a fully bi-directional exchange of experiences, personnel, and opportunities;

- The value of broad-based teams involving government, industry, and non-governmental environmental groups;

- The need to evaluate and streamline policies for renewables to include those of the multi-lateral lending institutions with an emphasis on conservation;

- A proposal for a joint working group specifically on coal to focus on mining, washing and methane capture as well as improving the efficiency of coal-based energy systems at every stage was emphasized.

APPENDIX 3.

US DOE INDIA BUSINESS/GOVERNMENT DELEGATION LIST

Ms. Nancy M. Bacon
Senior Vice President, Government Contracts
and International Projects
Energy Conversion Devices, Inc.
1675 West Maple Road
Troy, MI 48084
810/280-1900
810/280-1456 (fax)

Mr. Dennis W. Bakke
President & CEO
The AES Corporation
1001 N. 19th Street, Suite 2000
Arlington, VA 22209
703/353-0509 703/522-1315
703/528-4510 (fax)

Ambassador Harry Barnes, Jr.
Senior Fellow
World Wildlife Fund USA
c/o Hapenney Road
Peacham, VT 05862
802/592-3206
802/592-3206 (voice and fax)

Mr. Scott Bayman
President and CEO, GE India
GE International Operations Co.
International Trade Tower, 14th Floor
Nehru, New Delhi
India
91-11-642-8001
91-11-646-7045 (fax)

Ms. Deborah L. Bleviss
International Institute for Energy
Conservation
750 First Street, NW, Suite 940
Washington, DC 20002
202/842-3388
202/842-7565 (fax)

Mr. William H. Cavitt
Department of Commerce
International Economic Policy - Canada Ofc
14th and Constitution Avenue, NW
Room 3033
Washington, DC 20230
202/482-3103
202/482-4736 (fax)

Ms. Eileen Claussen
Special Assistant to the President and
Senior Director for Global and
Environmental Affairs
National Security Council
1600 Pennsylvania Avenue, NW, Room 365
Washington, DC 20500
202/395-4985
202/456-2219 (fax)

Mr. Charles T. Condy
President and CEO
Proven Alternatives, Inc.
601 California Street, #2200
San Francisco, CA 94108
415/781-2001
415/781-0552 (fax)

rev. 8/1/94

Mr. James W. Cook
President & CEO
CMS Generation Company
Fairlane Plaza South
330 Town Center Drive, Suite 1000
Dearborn, MI 48126
313/436-3242
313/436-9533 (fax)

The Honorable E. Gail de Planque
Commissioner
U.S. Nuclear Regulatory Commission
Mail Stop 16H3
Washington, DC 20555
301/504-1800
301/504-3509 (fax)

Dr. Subhash Dhar
President
Ovonic Battery Company
1707 Northwood
Troy, MI 48084
810/362-1750
810/362-0332 (fax)

Mr. Dan Dudek
Senior Economist
Environmental Defense Fund
257 Park Avenue South
New York, NY 10010
212/505-2100
212/505-2375 (fax)

Dr. Sonja Ebron
President
Solar Power & Light, Inc.
2267 Macedo Road
Palm Bay, FL 32907
407/723-4404 (voice and fax)

Mr. Robert H. Eggleston
President
EFH Coal Company
North American Division
P.O. Box 669
Mars, PA 16046
717/823-7664
717/829-4515 (fax)

Mr. Charles F. Goff
President & Chief Executive Office
Destec Energy, Inc.
2500 Citywest Boulevard, Suite 150
Houston, TX 77042
713/735-4209
713/735-4208 (fax)

Ms. Lisa R. Gued
Vice President
Solar Power & Light, Inc.
2267 Macedo Road
Palm Bay, FL 32907
407/723-4404 (voice and fax)

Mr. Robert Halligan
Administrator, International Programs
National Rural Electric
Cooperative Association
1800 Massachusetts Avenue, NW
Washington, DC 20036-1883
202/857-9686
202/857-4863 (fax)

Mr. Walter J. Hesse
President & CEO
ENTECH, Inc.
P.O. Box 612246
DFW Airport, TX 75261
214/456-0900
214/456-0904 (fax)

Mr. Louis Martarano
Director, Strategic Advisory Services, Global Power
Merrill Lynch & Co.
250 Vesey Street
World Financial Center
New York, NY 10281
212/449-1287
212/449-8636 (fax)

Ms. Linda A. Marvin
Acting President
Lockheed Environmental Systems and Technologies Company
Citicorp Center
1200 Smith Street, Suite 800
Houston, TX 77002-4309
713/654-4830
713/654-4850 (fax)

Mr. Peter McChesney
Director of Business Development
Community Energy Alternatives
1200 East Ridgeview
Ridgeview, NJ 07540
201/652-2772
201/652-8354 (fax)

Ms. Janet McFarland
Senior Policy Advisor to the Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
202/260-1634
202/260-5155 (fax)

Mr. Brian J. O'Sullivan
Manging Director
Cannon Power Corporation
P.O. Box 1457
Tehachapi, CA 93581
805/822-7524
805/822-8394 (fax)

Dr. Lawrence T. Papay
Senior Vice President & Manager of Research & Development
Bechtel Group, Inc.
50 Beale Street
San Francisco, CA 94105-1895
415/768-0275
415/768-0503 (fax)

Mr. Daniel Radack
Manager, International Business Development
SRC International
111 Presidential Boulevard, Suite 127
Bala Cynwyd, PA 19004
610/667-2160
610/667-5593 (fax)

Dr. A.V. Mohan Rao
Vice President, Marketing
Spectrum Power Generation, Ltd.
133 Wall Street
Schenectady, NY 12305
518/382-0056
518/382-0283 (fax)

Mr. Lewis Reade
Director General
U.S. - Asia Environmental Partnership
320 21st Street, NW
Room 3319
Washington, DC 20523-0047
202/647-9969
202/647-4921 (fax)

Dr. George Roland
President and CEO
Siemens Solar Industries
4650 Adohr Lane
Camarillo, CA 93012
805/482-6880
805/388-6395 (fax)

rev. 8/1/94

Mr. Harvey A. Himberg
Investment Development Department
Overseas Private Investment Corporation
1100 New York Avenue, NW
Washington, DC 20527
202/336-8614
202/408-5145 (fax)

Mr. David Jhirad
Agency for International Development
New Executive Office Building
Examiners & Staff Specialists
Washington, DC 20503
202/395-4594
202/395-3888 (fax)

Mr. Paul C. Johnson
President, South Asia Region
Martin Marietta International, Inc.
240 Tanjong Pagas Road
GE Tower #08-00
Singapore 0208
65-328-3365
65-326-3378 (fax)

Mr. Ramesh Kapur
MED-TECH Medical-Technical Gases
20 Hall Street
Medford, MA 02155
617/395-1946
617/395-9098 (fax)

Martin Klepper, Esquire
Partner
Skadden, Arps, Slate, Meagher & Flom
1440 New York Avenue, NW
Washington, DC 20005
202/371-7120
202/393-5760 (fax)
617/395-9098 (fax)

Mr. Vello A. Kuuskraa
President
Advanced Resources International, Inc.
1110 North Glebe Road, Suite 600
Arlington, VA 22201
703/528-8420
703/528-0439 (fax)

Mr. Roger G. Little
President
Spire Corporation
One Patriots Park
Bedford, MA 01730-2396
617/275-6000
617/275-7470 (fax)

Reinier H.J.H. Lock, Esquire
LeBoeuf, Lamb, Greene & MacRae
1875 Connecticut Avenue, NW
Washington, DC 20009-5728
202/986-8024, x8128
202/986-8102 (fax)

Arjun Makhijani, Ph.D.
President
Institute for Energy
and Environmental Research
6935 Laurel Avenue
Takoma Park, MD 20912
301/270-5500
301/270-3029 (fax)

Ms. Amal M. Mansour
Chairman of the Board and CEO
Manufacturing & Technology Conversion
International, Inc.
5570 Sterret Place, Suite 206
Columbia, MD 21044
410/730-0445 301/982-1292 (metro)
410/997-6980 (fax)

rev. 8/1/94

Ms. Ellen S. Roy
Vice President of Government Relations
Intercontinental Energy Group
350 Lincoln Place
Hingham, MA 02043
617/749-9800
617/740-1281 (fax)

Mr. Fred C. Schulte
President and CEO
Elgin National Industries
120 South Riverside
Chicago, IL 60606-3919
312/454-1900
312/236-2668 (fax)

Mr. Niranjan S. Shah
CEO
Globetrotters Engineering Corporation
300 S. Wacker Drive, Suite 200
Chicago, IL 60606
312/922-6400
312/922-2953 (fax)

Mr. Ishaq Shahryar
President
Solec International, Inc.
12533 Chadron Avenue
Hawthorne, CA 90250
310/970-0065
310/970-1065 (fax)

George J. Sterzinger, Esquire
Manager, Biomast to Energy Division
Future Energy Resources Company
1615 M Street, NW, Suite 800
Washington, DC 20036
202/467-6370
202/467-6379 (fax)

Mr. Carlton Stoiber
Director, Office of International Programs
U.S. Nuclear Regulato5ry Commission
Mail Stop 17F2
Washington, DC 20555
301/504-1780
301/504-2400 (fax)

Mr. Richard L. Thompson
Chief Executive, Engine Division
Caterpillar Inc., Engine Division
P.O. Box 610
Mossville, IL 61552-0610
309/578-8001
309/578-2510 (fax)

Mr. Terence H. Thorn
Sr. Vice President, Government Affairs
Enron Corp.
1400 Smith Street
Houston, TX 77023-7269
713/853-3071
713/853-3129 (fax)

Mr. Charles A. Trabandt
Chairman, Strategic Advisory Services,
Global Power
Merrill Lynch & Co.
250 Vesey Street
World Financial Center
New York, NY 10281
212/449-9793
212/449-8636 (fax)

Mr. Thomas Wilbanks
Oak Ridge National Laboratory
P. O. Box 2008
Oak Ridge, TN 37831
617/574-5517

rev. 8/1/94

TRIP REPORT

PRESIDENTIAL MISSION ON SUSTAINABLE ENERGY AND TRADE TO INDIA LED BY SECRETARY OF ENERGY HAZEL O'LEARY

July 7 - 15, 1994

INTRODUCTION

United States Secretary of Energy Hazel R. O'Leary's headed a Presidential Mission to India, July 7-15, 1994. The Mission began a new era for partnerships between the United States and India by closing commercial deals valued at more than $400 million. In meetings with the Indian government, the delegation advanced other fast-track power projects valued at over $3 billion and reached several important government-to-government agreements on energy and environmental cooperation.

Conducted at the initiative of President Bill Clinton after his May 19, 1994 meeting with Prime Minister P.V. Rao in Washington, D.C., the mission was the first official visit to India by a U.S. cabinet secretary in many years. It included an official delegation of over 60 leading business executives, environmental leaders and government officials. For the first time in Department history, the delegation included a diverse complement of renewable energy and energy efficiency companies, and small, minority and women-owned businesses as well as executives from large American multinational corporations.

President Clinton defined the goals and objectives of the mission in a July 5 letter to the delegation, charging them to promote Indo/U.S. cooperation in energy, sustainable development and free trade. The President urged the mission to "forge new bonds of friendship and collaboration with India's business leaders... to foster new alliances with environmental and public interest groups to assure a broad base of support for our emerging partnerships... [and] to build on the shared commitments that Prime Minister Rao and I made to expand the commercial ties between our nations."

The Indian government shared these goals, which produced an atmosphere for remarkable progress. The mission was welcomed warmly by the Indian people, ranging from the Prime Minister Rao to senior-level civil servants to the working people in rural villages. The visit received impressive media coverage with over 50 newspaper articles and numerous television accounts. One newspaper described the visit by saying, "Hazel O'Leary may be the U.S. Energy Secretary, but diplomacy is high on her agenda on this visit to India as is sustainable energy development... If Indo-US relations were prickly for the past year, they certainly seem

to be on the mend now." (*"A charming mix of business and diplomacy,"* The Times of India, July 13, 1994, p. 13.)

The delegation had an ambitious schedule of official meetings in New Delhi and Bombay with Indian representatives from government, business and non-governmental organizations. The trip included private commercial negotiations as well as detailed policy discussions in public round-tables. The group toured power plants, renewable energy centers, a rural village and cultural sites-- notably the Taj Mahal. Finally, the mission included several celebrations of our new partnerships in the form of dedications of Sustainability Centers, announcements of joint ventures and festive evening receptions that will lead to lasting personal friendships and valuable professional relationships.

In sum, Secretary O'Leary's Presidential Mission on Sustainable Energy and Trade marked an historic milestone in Indo/U.S. relations by building strong relationships with government and industry, establishing public trust with broad constituencies and advancing near-term business deals as first steps toward free trade. The legacy of this visit will be most significant over the long-term as increased commercial links and government contacts foster sustained economic growth in both nations.

HIGHLIGHTS & TRIP SUMMARY

President Clinton's May 19, 1994, meeting with Prime Minister Rao opened a tremendous opportunity to move past the years of strained Indo/U.S. relations and into a new era of partnership and trust. For the U.S. delegation, the opportunity was particularly ripe, because energy is the Prime Minister's top priority in advancing India's sustainable development goals. The Prime Minister sent a strong signal through his government of the high value he placed on this mission by scheduling an hour-long meeting with Secretary O'Leary.

The Prime Minister's interest in energy stems from the fact that shortages of electric power are the major bottleneck in achieving India's economic goals. Over the next fifteen years, India will register the one of the greatest increases of electric generation capacity in the world, second only to China. It expects to add nearly 60,000 megawatts of electrical power by 2000, and over 140,000 megawatts by 2007-- requiring investment of approximately $200 billion.

Importantly, the delegation worked extremely hard to develop a joint strategy on how to make the most of this unprecedented mission. In small group ("pod") discussions held during the plane trip to India and continuing in weekend preparation sessions, the group defined a series of common goals, strategies and desired outcomes. The general approach was to establish trust with the Indian hosts in government and the private sector before pressing matters of policy and business. The U.S. team also sought to understand the needs of the average people in India, their cultural and spiritual values, and to appreciate how these dynamics

translate into political constraints and opportunities for policy-makers. The mission hoped to demonstrate the mission's understanding of the value of political consensus through the composition of the U.S. delegation-- a joint effort of government, business and environmental leaders. Finally, the delegation hoped to create a positive climate for moving forward the mission's policy agenda and, in the end, to close business deals that would mutually benefit India and the United States.

The delegation also sought to be well prepared substantively for the week's busy schedule, taking advantage of briefings offered by the U.S. Embassy and representatives of American companies already active in India on the Indian energy outlook, policy framework and trade barriers to foreign companies trying to do business with Indian firms.

From the moment Power Minister Salve met the Secretary at the airport on Friday, July 8, for an arrival press conference, a tone of enthusiasm and excitement invigorated the mission. A Sunday luncheon with key energy ministers and officials formally opened a positive dialogue that continued in a Government-to-Government Roundtable on Monday. As each of the Indian Ministers outlined their priorities, the delegation found them to be closely aligned with U.S. interests. Where there were differences, the mission sought opportunities to resolve them.

Sunday evening's visit to the Taj Mahal at sunset provided the delegation with a deep appreciation for the cultural history that unites India. The Secretary's announcement of a joint program to reduce emissions from energy sources in the region that threaten the monument symbolized the importance of Indo/U.S. cooperation. This offer of technical assistance was well received throughout India.

Tuesday, July 12, Secretary O'Leary met with Prime Minister Rao, signaling to the Indian public the mission's high level of importance. After presenting the Prime Minister with a letter from President Clinton, Secretary O'Leary noted the historic opportunity for Indo/U.S. partnerships in sustainable energy and commended the Prime Minister on his vision for more renewable energy. She urged prompt action on seven "fast track" powerplant projects as the best accomplishment on which to build future collaboration on the nearly 60 projects ripe for action. The Prime Minister reiterated his support for the seven projects and assured her that all possible measures would be taken to move them forward. He proposed the establishment of a sub-commission under the Indo/U.S. Joint Commission to expedite private power projects. Finally, he affirmed the appropriateness of opening a nuclear safety dialogue between experts in India and the U.S.

Over the next three days, the delegation visited privately with the Ministers for Finance; Power; Non-Conventional Energy; Environment and Forests; Petroleum and Natural Gas; and Coal. In addition, a small business delegation met with the Minister of Law. Overall, these meetings exceeded expectations in gaining commitments to advance the joint agenda (see accomplishments listed below). The Ministers' enthusiasm was evident in the fact that they also appeared at a number of receptions and public events related to the Secretary's visit.

In particular, Power Minister Salve became a strong ally, envisioning ways to meet the needs of the Indian public through partnerships with independent power developers and renewable energy producers. Also, the delegation found helpful renewable energy partners in Minister for Non-Conventional Energy Kumar and the Minister of Environment and Forests Nath.

One of the key issues cutting across the variety of energy deals advocated by Secretary O'Leary was that of project finance. In recognition of this, the Indian government accorded this issue high priority in talks with the delegation. Finance Minister Singh met privately with the Secretary and then participated in a vibrant roundtable exchange with members of the delegation, contributing much more time than expected. He reassured the delegation on a number of points relating to project finance and import duties, and these points will be key factors in the follow up to the trip.

Power Minister Salve and Secretary O'Leary shared the vision that the path to sustainable energy development must lead to benefits for the average citizen. To understand this, Dr. R.K. Patchauri arranged for the delegation to visit Dhanawas, a tiny hamlet of 300 households. This provided tremendous insight into the lives of the 700 million Indians who live in rural villages, and how important sustainable energy is to them. After a walk up a new brick road laid for the visit, Secretary O'Leary joined a lively celebration in honor of the delegation. School children sang and danced. Under a colorful tent, the Secretary sat cross-legged with hundreds of women from the village who described their hopes and concerns and talked about ways that new types of energy could create new opportunities. More than any other single part of the mission, the visit to Dhanawas reminded the delegation members why they were in India: not only to promote Indo/U.S. trade, but to promote equitable social and economic progress in both of countries. Development is only sustainable if, in the end, it contributes to the well-being of all people.

The Indian media followed this event with interest, given the delegation's interest in gaining an appreciation for village life. In wide press coverage, news accounts described the reaction of people in the village:

> The villagers, whose lives today are changed with the use of this [renewable] technology, were eager to meet the expert from America who was coming all this way to their village.
>
> The women donned their festive ghagra-cholis and jewelry, and the entire village waited patiently in the school compound, some even on the rooftops overlooking the compound to greet Ms. O'Leary.... She was mobbed by villagers eager for a glimpse of her as soon as she arrived.
>
> The women could relate to Ms. O'Leary as one of them but someone more powerful who would help them solve their immediate problems. Ms. O'Leary was encouraging. "I believe in you," she said. "We need you to continue to speak out, but you could

also be the leader." (*"Haryana women find O'Leary more powerful but one of them,"* The Asian Age, July 14, 1994, page 2.)

That same day, the delegation toured a the Ministry of Non-Conventional Energy's Solar Energy Research Center, where foreign products are tested for application in India. At this event, a number of village leaders exhibited displays of ways they are using renewable technologies to power cottage industries in their towns. Next door, the delegation joined Dr. R.K. Patchauri and his staff at the Tata Energy Research Institute (TERI) to tour their sustainable energy campus' demonstration projects on biomass-to-energy conversion and reforestation. Secretary O'Leary dedicated the Center for Energy and Sustainable Development, a cooperative project between the TERI, the Indian Ministry of Non-Conventional Energy and the U.S. Department of Energy. The Center will be a first point-of-contact for firms entering the Indian market for energy efficiency and renewable energy and will facilitate joint ventures, particularly for small and medium-sized businesses, like some of those present from the U.S. delegation.

A number of group events worked to bring Indian and U.S. business and environmental leaders together. A well-attended luncheon with the Confederation of Indian Industries opened dialogue between the U.S. and Indian business communities. It led to the signing of a joint agreement between the S.K. Bhargava, President of the Confederation of Indian Industries, and delegation member Ellen Roy, Chair of the National Independent Energy Producers in the United States, on cooperation in private power policy development. The Confederation also signed a cooperative agreement with the U.S. Renewable Energy Resources Association.

A day-long *Indo/U.S. Energy Summit: Cooperation for Sustainable Development* provided a platform for Secretary O'Leary and her counterparts in the energy ministries to set forth their visions of future cooperation and to lay a foundation for productive discussions at the breakout sessions. The Summit drew together over 500 government, industry and environmental participants. It stimulated over 200 new business meetings between delegates and Indian businesses that occurred that evening and the following day. These business contacts hold great potential for deals that could produce jobs for workers both in India and the U.S.

In the Summit's plenary session, Minister of Power Salve braced the Indian public for possible electricity rate increases to finance new power projects. This was a bold stance to take politically as elections near, but it provided an important message for project developers and financiers. He stressed the importance of using appropriate technologies for generation, transmission and distribution. And importantly, he emphasized that counter-guarantees by the national government would be required for the first several power projects with various state electricity boards in order to attract capital from international financiers, since the boards are not financially stable enough to satisfy lenders.

In her keynote speech to the Summit, Secretary O'Leary communicated a message of friendship by stressing the common heritage of India and the United States, particularly in the inspiration Mahatama Gandhi provided to Martin Luther King and the American civil rights movement. She advocated building on the Indian and U.S. common past of promoting liberty and democracy by advancing free trade between the two nations. She proposed cooperative approaches to sustainable development that would bring U.S. advanced technology and expertise to help meet India's tremendous energy needs. To assure progress, she proposed to meet again every six months, beginning with an Indian visit to the U.S. early in 1995 and continuing with her return visit to India within a year.

After the plenary session, the Summit continued in five technical sessions: Renewable Energy; Oil and Gas; Coal Mining, Preparation and Industrial Utilization; Power Generation, Transmission and Distribution; and Energy Resource Integration and Management. In addition, a project finance session was held with all participants at the Summit. Each of these sessions produced specific recommendations for actions which will be addressed in the mission follow up work.

Wednesday, July 13, Secretary O'Leary and members of the delegation travelled to the outskirts of Delhi to dedicate the National Thermal Power Corporation's Energy Efficiency and Environment Center. The Department of Energy, the Agency for International Development and the United States/Asia Environmental Partnership representatives committed to work in partnership with electric utilities in India to improve the environmental performance and efficiency of India's electric power production, transmission and distribution systems. Environment and Forest Minister Nath hosted a luncheon for the Secretary and delegates representing environmental groups.

In a special session on "Indo/U.S. Energy Partnerships for the Future," which was separate from the Summit, non-governmental organizations facilitated discussion with a cross section of 40 people from government, industry and environmental organizations. They took the recommendations from the Summit and produced an action plan for integrating environmental groups into cooperative government and business projects resulting from the mission.

The New Delhi visit ended with a press conference packed with reporters. Nine commercial business deals were signed and five government-to-government agreements were entered. There were more renewable energy projects announced than on any previous trade mission, as well as the first signing of a pilot project in India that would be submitted for consideration under the U.S. Initiative on Joint Implementation.

In Bombay Thursday, July 14, Secretary O'Leary and members of the delegation participated in a Roundtable on Mobilization of Project Financing. This group of over 100 financiers recommended that the Government of India move promptly to provide counter-guarantees to the seven "fast track" power projects and that it consider continuing to offer counter-guarantees for projects until state electricity boards are more financially solid. The U.S.

delegates from the financial community committed to return in six months to conduct further work and to measure progress.

A significant advancement occurred when Secretary O'Leary, Nuclear Regulatory Commissioner Gail de Planque and other nuclear energy experts on the delegation met with Indian Atomic Energy Commission Chairman Chidambaram and reached agreement on regular consultations on nuclear safety.

The mission closed with a major announcements of the first energy efficiency services contract between a U.S. efficiency firm and an Indian textile mill and of a joint venture that will bring solar lantern to rural India and produce manufacturing jobs in India and California. Bombay Mayor Sumitra Samand Prabhabalkar presented Secretary O'Leary with a artistic depiction of the sun, and the Secretary reciprocated with a gift of a solar lantern. These signings took place along-side a mock village complete with local artisans.

The evening ended with an state dinner hosted by Chief Minister of Maharashtra Province, Mr. Sharad Pawar. Power Minister Salve flew to Bombay for the dinner to bid farewell to Secretary O'Leary and the delegation. He also accompanied the delegation to the airport for a final send-off. This important gesture by Minister Salve illustrates the mission's success in forging ties with Indian leaders that will support increased commerce in sustainable energy between India and the United States.

ACCOMPLISHMENTS

I. RENEWABLE ENERGY

Opportunities for Cooperation:

Renewable energy enjoys substantial political support in India at the highest levels, championed not just by the Ministry of Non-Conventional Energy Sources and the Ministry of Environment and Forests, but also by the Prime Minister himself.

The Ministry for Non-Conventional Energy Sources estimates that 100,000 rural villages in India are without electricity and has established a 1997 goal of 2,000 megawatts of installed renewable energy capacity, a ten-fold increase. For these communities, wind and solar energy may be particularly cost-effective when compared against electricity distributed from large central power stations. In agricultural settings, biomass is also an attractive strategy for making sustainable use of agricultural waste. Current renewable/cogeneration proposals total nearly 27,000 megawatts of capacity potential. For example, 10,000 megawatts of capacity from use of bagasse is projected for the sugar industry alone.

Barriers:

- Tariffs on renewable energy equipment are high and sometimes unpredictable, ranging from 25% to 300%. They create artificially high prices for use of these sustainable technologies.

- Technical cooperation in product testing and certification is needed to assure local acceptance of U.S. renewable energy products.

- Procedures for establishing joint ventures are cumbersome and slow projects down.

- The terms established by the Indian Renewable Energy Development Agency for accessing World Bank financing of $450 million are not attractive to investors. The paperwork is complex and the interest rates are high.

Accomplishments:

The Mission resulted in the following, mutually agreed actions to support reaching India's ambitious 2,000 megawatt goal for renewables:

- The Department and the Indian Ministry of Non-Conventional Energy Sources signed the Statement of Intent to Cooperate on renewable energy development.

- Four inaugural projects to be conducted within the framework of the Statement of Intent were identified.

  - Advanced biomass gasification
  - Rural electrification
  - Photovoltaic concentrator evaluation program
  - Cooperation on technology standards and specifications

- The Secretary agreed to increase cooperation between the Ministry's Solar Energy Center and the Department's National Renewable Energy Laboratory.

- To advance private sector partnerships, the U.S. Renewable Energy Resources Association signed a cooperative agreement with the Confederation of Indian Industries.

- To streamline, standardize, and shorten the joint venture process, the Ministry of Non-Conventional Energy Sources agreed to establish a special organizational unit to expedite joint venture applications and resolve issues brought to them by specific ventures.

- The Indian government agreed to accelerate consideration of standardizing customs and tariffs on U.S. renewable energy products imported into India. Discussions on this issue are to begin immediately among the appropriate authorities in India.

- To resolve issues impeding the flow of the $450 million fund for renewables administered by the India Renewable Energy Development Agency, the Department agreed to hold a meeting in September 1994 in Washington between U.S., Indian, and World Bank officials responsible for disbursement procedures.

- Finally and most importantly, a record number of renewable energy joint ventures were announced as part of the mission. The total near-term value of these ventures is $202 million. Mid-term opportunities resulting from these initial efforts are projected to be in excess of $500 million. The job creation potential for these ventures is estimated to be 4,400. The projects are listed on the following chart:

MISSION SUCCESS IN RENEWABLE ENERGY

VENTURE PARTNERS	*DESCRIPTION*	*NEAR TERM BENEFITS*
Baharat Electronics & Spire Corporation	Sale of photovoltaic manufacturing equipment for Indian production	$2 million 50 jobs in Massachusetts
Pentafour/Solec	Sale of U.S. produced photovoltaic cells for module assembly in India	$6.5 million 150 jobs in California
Bangor Group & Cannon Power Corp.	Opening of Cannon office in India & signing agreement on 25 MW wind farm	$75 million
ESVIN TECH & MTCI	Licensing U.S. gasification technologies for Indian waste to energy market	[To be determined]
Bhoruka & SRC International	Efficiency and demand side management contract for Bombay textile firms	$3.8 million 84 jobs in India & U.S.
Emgee Solar & Martin Marietta	Develop photovoltaic systems and begin joint venture manufacturing	$66 million 1,450 jobs in Colorado
Siemens India & Siemens Solar Industries	Assemble and sell solar lanterns with components manufactured in the U.S.	$40 million 880 jobs in California
Tata Energy Research Institute, Lockheed Environmental Services, Econergy International, Duke Engineering and Services, Environmental Defense Fund, TransAlta Utilities and Niagara Mohawk Power	Develop a bagasse-fired cogeneration facility at 4 Indian sugar mills as joint implementation pilot project	[To be determined]
Delton Cable & Ovonics	Sale of production equipment and license for Indian production of advanced batteries	$9 million 200 jobs in Michigan

II. ENERGY EFFICIENCY

Opportunities for Cooperation:

One of the most promising areas for Indo/U.S. cooperation is in improving energy efficiency. Nearly half of all of India's energy consumption is in its industrial sector. The energy intensity component of the gross domestic product in India is 40 % higher than in the U.S., so there is considerable potential for the U.S. to assist India in energy efficiency.

Improved energy efficiency is important to India's sustainable economic development for several reasons. It could provide the least-cost increment of additional energy without the need for building new generating capacity. Energy efficiency activities would add to the job market-- especially with moderate to lower-skilled jobs. Building efficient energy use into the operation of an expanding economy would save money compared with retrofitting equipment later to address the already serious air and water quality concerns in industrialized urban areas. This type of focus on energy efficiency could result in an expanded market for many U.S. services and products as well as a very effective response to the nation's international environmental commitments.

The Indian government clearly recognizes the valuable role that energy efficiency can play in conserving resources, improving living conditions, and stimulating the economy. And it recognizes that proper price signals are important to advance efficient end use. As noted before, Power Minister Salve announced a significant policy development with impacts on energy efficiency: that electric power subsidies would have to be phased out and rates increased if the people of India want to enjoy the benefits of high quality electric power. This was widely reported in the local and national press and sent a signal to efficiency firms and power developers alike that the economics of cooperation will improve.

Barriers:

The Indo-U.S. Energy Summit and the subsequent roundtable discussions identified several issues that will need to be addressed to improve the climate for energy efficiency:

- India's energy pricing structure is over-burdened with subsidies and does not reflect full costs. In many instances, it reflects *no* costs-- because power is stolen by unmetered connections to the electricity distribution system. Theft of electric power amounts to nearly 42% of generated power in some areas, and that rate could increase with electricity rate increases.

- There is not an effective governmental capability to guide the generation, transmission, and distribution of power.

- There is an insufficient evaluation framework through which energy options can be compared, such as through integrated resource planning, under which energy efficiency options would prove attractive.

Accomplishments:

- SRC International and Bhourka Corp. signed an agreement to establish and operate India's first energy services company. This joint venture will manage the energy use in a textile manufacturing facility. The project is anticipated to save $1.8 million per year and will pay-back the investment within two years.

- Secretary O'Leary and Minister Salve signed a Statement of Intent to Cooperate on Energy Efficiency. The statement called for cooperation in setting appliance and equipment standards, establishing energy service companies and sharing government experience in market conditioning activities and integrated resource planning. This statement will serve as a guide for both program and policy interface between India and the U.S.

- The Joint Secretary for Energy Efficiency of the Ministry of Power and staff of the Oak Ridge National Laboratory agreed to collaborate on techniques to stop transmission and distribution power losses.

- The mission committed to U.S. participation in key Indian energy conferences in 1994 and 1995 as a means of providing training in integrated resource planning, demand-side management, load shaping modeling and computer simulation, integration of renewable sources, and end-use efficiencies.

- Secretary O'Leary and Minister Salve agreed that Indian leaders would visit the United States to view means of increasing power availability through energy efficient transmission and distribution.

- Secretary O'Leary dedicated the National Thermal Power Corporation's Energy Efficiency and Environmental Technology Center. This will open the door for identifying the cost-effective options for improving the efficiency and environmental performance of India's power sector. The Center will be supported by the U.S. Agency for International Development's U.S./Asia Environmental Partnership and the Global Environmental Facility through the Department of Energy. In addition, Jack Siegel, the Department of Energy's Acting Assistant Secretary for Fossil Energy, and Walter Bollinger, AID's India Director, signed a Protocol of Intent to conduct a variety of projects at the facility to improve efficiencies and reduce pollution.

- Secretary O'Leary and Minister for Non-Conventional Energy Krishna Kumar dedicated the Center for Energy and Sustainable Development at the Tata Energy Research Institute. This Center will help U.S. efficiency and renewable firms gain access to Indian markets.

It will particularly reach out to small and medium-sized businesses interested in joint ventures, and it will make use of the emerging international information highway to bring together potential partners.

III. ELECTRIC POWER PRODUCTION

Opportunities for Cooperation:

While India is demonstrating considerable interest in alternative sources of energy, such as energy efficiency and renewables, it remains dependant on traditional energy supply to meet the majority of its energy needs. India is expected to add tremendous electric power generation capacity, second in the world only behind China in total capacity increase.

India's electric power demand is expected to grow by 26,000 megawatts by 1995, 60,000 megawatts by 2000 and 140,000 megawatts by 2007. As a result, the nearly $200 billion of needed investment represents a great opportunity for the sale of U.S. power equipment and services, estimated at to be $25 billion. India is on a clear path towards privatizing power production. Seven "fast track" private power projects valued at $5.7 billion are well along in the approval process; six of these projects involve U.S. developers and equipment. Over 60 other private power deals are at various stages of development.

India is the world's fourth largest coal producer. Seventy percent of India's electric power is derived from coal. It is also projected that 70% of all future power projects through 2010 will be coal-based. By introducing clean coal technologies, the opportunity exists to reduce by over 90% emissions of sulfur dioxide and to reduce nitrogen oxides and carbon dioxide emissions by 50%. In addition, 23% of all electric power now produced in India is lost as a result of inefficient transmission and distribution systems. The opportunity exists to export U.S. equipment and services to reduce these losses.

The existing electric powerplants in India are aging and operate at efficiencies that are estimated at 28%, well below world standards. U.S. firms have an opportunity to offer equipment and services to modernize these plants to improve environmental performance and plant reliability and reduce the need for new plant additions.

Barriers:

- The ability to finance the needed electric capacity is in question and remains the major barrier. For example, at least initially, investors in plants must receive counter-guarantees from the Government of India in order to obtain financing. In addition, India's State Electricity Boards must be reformed to make projects easier to finance in the future.

  - Extended delay or failure to finance the seven "fast track" projects could not only discredit the well conceived Indian reform program, but it also would undermine

India's credibility as a favored country in an increasingly competitive market for international capital for power development in emerging markets.

-- In the near term, international financiers are likely to require counter guarantees for at least some of the power projects currently under evaluation.

-- For the longer term, the development of a commercially viable power sector and independent regulatory regime that assures predictable and fair governance may provide assurance of payment adequate to replace Indian counter-guarantees. It will take several years and considerable political will to achieve these reforms.

- Misperceptions exist about the commercial availability of clean coal technologies. Indian officials incorrectly believed that the technologies were neither proven nor economical.

- There is limited understanding of the specific actions that could be taken to improve the efficiency of powerplants or transmission and distribution systems. Pricing schemes (focusing only on capital costs) provide no incentive for improving efficiencies and thereby reducing electricity costs.

- Environmental standards are lax or nonexistent. As a result, no incentives exist for advanced technologies like those currently used in developed countries.

Accomplishments:

- The mission received nearly unanimous support from the Indian government and business community on the necessity of counter guarantees as a transitional strategy for financing private power projects. This survived considerable pressure from the political opposition before and during the mission.

- As a result of the mission, Indian officials advanced proposals on counter-guarantees for two large U.S.-led private power projects, Enron Corporation and AES, with combined value of nearly $2.75 billion). These counter-guarantees will enable these two projects to complete their financing packages and move into construction, providing momentum for the other five "fast track" projects. In addition, these initial successes combined with the Indian government's commitment to further reforms in power and finance will pave the way to move forward with the more than 60 other cooperative projects that are under various stages of development.

- Authoritative information provided by the U.S. delegation on the commercial viability of clean coal technologies cleared up misperceptions and paved the way for commercial tenders that will be based on these technologies. In addition, the Department of Energy announced technical support for site specific studies on integrated gasification combined cycle, paving the way for its commercial use in India.

- Elgin Industries and Spectrum Technologies (USA), Spectrum Washeries (India) and Jaya Foods, India, signed a consortia agreement to demonstrate coal washing technology. This is expected to lead to a $100 million U.S. private sector coal washing program in India.

- Spectrum Industries signed a power purchase agreement for a $245 million gas combined cycle power project.

- The Confederation of Indian Industries and National Independent Energy Producers of the U.S. signed an cooperative agreement to recommend reforms and oversee the progress made in implementing reforms necessary to finance private power projects in India.

- Secretary O'Leary signed a Statement of Intent to Cooperate in Fossil Energy, as well as Records of Meetings with the Ministries of Power and Coal, which opened the door to commitments by the U.S. and India to cooperate in a wide variety of fossil energy and power technologies consistent with sustainable development.

V. OIL AND GAS

Opportunities:

India's oil reserves are estimated at 5.8 billion barrels and gas reserves at 660 billion cubic meters. U.S. companies are examining participation in the growing opportunities to produce oil and gas in India, because of recent reforms that offer better terms than previously available. Nearly 30% of all of the natural gas produced in India is flared, which wastes a valuable resource and unnecessarily releases air pollution. The opportunity exists for U.S. industry to install equipment to utilize the gas now flared. For example, natural gas is under-utilized in the electric power sector, and this presents an opportunity for U.S. power companies and equipment vendors to be among the first to build and operate gas-fired powerplants.

The general lack of advanced exploration and production technology in India resulting in inefficient resource production and premature abandonment of oil reservoirs opens another important opportunity for U.S. technology deployment, particularly in the area of enhanced oil recovery.

Although India produces large quantities of coal in which large quantities of methane is likely trapped, no coal-bed methane is produced commercially. The opportunity exists to develop the methane resources from coal, producing a valuable energy resource while controlling this very reactive greenhouse gas.

Barriers:

- The best Indian oil fields have not been available to foreign firms until now.

- India has insufficient infrastructure to use natural gas. It does not have the technology necessary to convert natural gas to liquids, nor does it have pipelines to transport it to market.

- The lack of natural gas and availability of large quantities of coal in India have been a disincentive for using natural gas, especially for power production. Conditions were not right for financial institutions to provide the financial support needed for private power projects using gas.

- U.S. companies with access to advanced exploration and production technologies were not given the necessary incentives to conduct commercial ventures in India. In addition, bilateral agreements to exchange information on these technologies have never existed.

- Indian officials are uninformed about the potential value of recovering coal-bed methane, because the resource has never been characterized.

Accomplishments:

- India has recently opened up the exploration and production markets to allow full and open competition.

- U.S. experts provided information to Ministry of Petroleum and Natural Gas officials on U.S. technologies to convert natural gas to liquids. Ministry officials encouraged U.S. companies to initiate projects to utilize gas, especially gas now flared.

- U.S. power developers and financial experts provided insights on the requirements for financing gas-based private power projects.

- Information was exchanged on U.S. exploration and production technologies. U.S. companies were encouraged by Indian Ministry of Petroleum and Natural Gas officials to introduce the technologies in India. DOE officials agreed to begin bilateral information exchanges on a variety of advanced oil and gas technologies.

- U.S. industry experts and Government officials promoted the importance of recovering methane in coal seams. Indian officials agreed to work with U.S. industry and DOE to characterize India's coal-bed methane resources.

- Significantly advanced approval for counter-guarantee for Enron's gas combined cycle private power project valued at nearly $2 billion.

- Spectrum Industries signed a power purchase agreement needed to finance their gas combined cycle private power project valued at $245 million.

- Secretary O'Leary, Minister of Power Salve and Minister of Coal Panda signed a Statement of Intent to Cooperate in Fossil Energy. In addition, the Secretary signed Records of Meeting with Ministers Salve and Panda, as well as Minister of Petroleum and Natural Gas Sharma, to advance research, development and commercial cooperation in a wide variety of gas, oil, coal and electric power technologies.

VI. NUCLEAR SAFETY

The Presidential Mission achieved a notable success in obtaining agreement by the Indian government to open a nuclear safety dialogue between the two nations. Prime Minister Rao affirmed this agreement after meeting with Secretary O'Leary, and later Indian Atomic Energy Commission Chairman Chidambaram confirmed this understanding in a meeting with the Secretary in Bombay.

U.S. Nuclear Regulatory Commissioner E. Gail de Planque and the Department of Energy's Nuclear Energy Director Terry Lash worked out an initial program of cooperation with Dr. A. Gopala Khrishnan, Chairman of the Atomic Energy Regulatory Board (AERB). They agreed that the dialogue would initially involve an informal series of technical exchanges and visits, focusing on a short list of topics of mutual interest. The Indian and U.S. nuclear regulatory agencies would coordinate the effort, with participation by other agencies as appropriate.

The agreed-upon six areas of interest are:

1) fire safety;
2) safety analysis of early generation boiling water reactors;
3) training of regulatory personnel;
4) decontamination and decommissioning of nuclear facilities;
5) planning, evaluation and analysis of technical aspects of geologic disposal of waste; and
6) radiation protection and medical applications of radioactivity.

The dialogue on these subjects will be pursued on a reciprocal basis through:

- site visits to appropriate visits to appropriate facilities;
- meetings and seminars (whether or not held in conjunction with site visits); and
- exchange of documents.

The precise details and timing of the safety dialogue will be developed through regular contacts between U.S. Nuclear Regulatory Commission and AERB, including:

- In September or October: an Indian technical visit to the U.S. to discuss early boiling water reactors (with possible visit to Dresden 2 Reactor and Brookhaven National Laboratory), fire safety (visit to the Fermi laboratory or another facility with a fire event),

training (visit to the U.S. NRC's Chattanooga Training Center) and nuclear medicine (visit to National Institutes of Health).

- In November or December: a U.S. team visit to India (perhaps headed by U.S. NRC Chairman Selin) to discuss fire safety (visit to Narora powerplant); a reactor under construction (visit to Kaiga or Rajasthan powerplants); safety analysis (visit to India Gandhi Research Center near Madras, with side trip to Madras nuclear powerplant); and nuclear medicine (visit to Tata Memorial Hospital and radiation protection labs in Bombay).

- Secretary O'Leary and Chairman Chidambaram tentatively agreed to meet while attending the International Atomic Energy Agency General Conference in Vienna in September 1994 to assess progress.

INITIAL ACTION PLAN

1. ESTABLISH INDIA ACTION TEAM

By August 15, the Department will create a U.S. team comprised of representatives from government, non-governmental organizations and industry. This team would build on the success of the "pods" and the Indo-U.S. Summit: Cooperation for Sustainable Energy Development (Summit) break-out groups. Given the link between sustainable energy cooperation and intellectual property rights concerns, this directive should also address proper coordination with efforts to resolve intellectual property rights issues in the efforts for a broader science and technology agreement. The goals of this team would include:

- Implementing the recommendations of the *Indo/U.S. Summit: Cooperation for Sustainable Energy Development*, the strategy of the session entitled *Indo/U.S. Partnership for the Future* and the actions from the ministerial meetings;

- Monitoring progress made and taking action to support U.S. industry projects seeking approval in India;

- Develop and implement a resource mobilization strategy to support follow up work, including working on possible assistance from the Departments of State and Commerce, the Agency for International Development and its U.S./Asia Environmental Partnership, the Environmental Protection Agency, the Trade and Development Agency, the Export-Import Bank and the Overseas Private Investment Corporation.

- Acting on the request to work with Indian businesses, the Confederation of Indian Industries and the Tata Energy Research Institute on cooperative programs to assist in

tailoring total quality management tools and techniques to India for managing their move toward privatization.

- Identifying new areas for cooperation and promotion of sustainable energy development, global environmental protection and Indo/U.S. trade;

- Developing a specific program to protect the Taj Mahal from further environmental degradation through a cooperative effort between the Environmental Protection Agency, the Department of the Interior, the Department of Energy, the White House and the Indian government;

- Establishing links to counterparts in India;

- Identifying areas for joint research and development cooperation for sustainable energy development; and

- Providing a process for identifying and removing barriers to sustainable energy development in both the U.S. and India with the intent of exporting technology and know-how.

The team members will develop an organizational structure by continuing and expanding the "pods." The team will prepare vision statements, benchmarks for progress, measurable goals, desired outcomes and specific action plans.

ACTIONS:

- Appoint action team leader by August 5, 1994.

- Identify and establish team and sub-team members (including interim leadership) and convene first team meeting by August 15, 1994;

- Initiate efforts to coordinate and expedite resolution of intellectual property rights concerns by September 15, 1994.

- Draft mission statements and recommend priorities by October 15, 1994;

- Finalize mission statements and action plan by December 1, 1994.

- Begin implementation by January 1, 1995.

2. *INDO/U.S. SUB-COMMISSION*

Based on the recommendations coming out of Secretary O'Leary's meeting with Prime Minister Rao, the purpose for this sub-commission to the Indo/U.S. Commission would be to monitor cooperation in the energy sector and implement the bilateral energy consultations signed during the mission. This sub-commission, as described by Prime Minister Rao, would assist in sorting out problems and removing administration bottlenecks to expedite projects in the energy sector.

This sub-commission is likely to be co-chaired by Secretary O'Leary and Minister of Power Salve, with representation from other relevant energy ministries. The Department of Energy would provide a secretariat for the sub-commission to serve as the focal point for coordination with other U.S. government agencies.

ACTIONS:

- Draft a protocol document by October 1, 1994.
- Obtain necessary approvals from other relevant U.S. agencies and negotiate text with Government of India by date to be determined.
- Sign protocol at next meeting between Secretary O'Leary and Minister Salve.

3. *WHITE HOUSE SUPPORT*

The Department will seek White House support for follow-up to the Presidential Mission on Sustainable Energy and Trade. The first action would be a Presidential directive to all relevant departments and agencies to participate actively in implementation and follow-up actions.

The agencies might include, among others, the Department of State, Energy and Commerce and the Agency for International Development, the Environmental Protection Agency, the Overseas Private Investment Corporation, the Export-Import Bank, the Trade and Development Agency and the U.S. Trade Representative as well as the National Security Council, the National Economic Council and the Office on Environmental Policy.

ACTIONS:

- Draft and propose text for a Presidential directive by September 1, 1994.

APPENDIX 1.

OFFICIAL DOCUMENTS SIGNED ON MISSION

1. Record of Meeting on Sustainable Production of Power in India

2. Summary of Discussions between the Ministry of Non-Conventional Sources (India) and the Department of Energy (U.S.)

3. Record of Meeting on Sustainable Development and the Use of India's Natural Gas and Petroleum Resources

4. Record of Meeting on Sustainable Development on India's Coal Resources

5. Memorandum of Understanding between the Department of Energy (U.S.) and Ministry of Power (India)

6. Joint Statement of Intent between the Department of Energy (U.S.) and the Ministry of Non-Conventional Energy Sources (India)

7. Joint Statement of Intent between the Department of Energy (U.S.) and the Ministry of Coal (India) to Cooperate in the Field of Fossil Energy

8. Joint Statement of Intent between the Ministry of Environment and Forests (India) and the Department of Energy (U.S.) to Cooperate in Environment Enhancing Energy Technologies

9. Joint Statement of Intent between the Department of Energy (U.S.) and the Ministry of Power (India) to Cooperate in the Field of Energy Efficiency

10. Protocol of Intent between the Department of Energy (U.S.), Agency for International Development (U.S.) and the Ministry of Power (India) and the National Thermal Power Corporation (India)

A

RECORD OF MEETING ON SUSTAINABLE PRODUCTION OF POWER IN INDIA

Secretary of Energy of the United States, Hazel R. O'Leary and Minister of Power of India, N.K.P. Salve, met on July 11, 1994, in New Delhi, India. The objective of the meeting was to explore opportunities for collaboration between the United States and India and to set measurable goals for each country to ensure that India's electric power industry will develop in a manner that will sustain India's economic growth while minimizing the environmental impact.

It was agreed that:

- Private power projects are the desirable mechanism to introduce improved technology and foreign capital into India's electric power expansion program. Therefore, the process of obtaining approvals for private power projects needs to be expedited. In that regard, counter guarantees for these initial projects must also be expedited. In the longer term, processes must be put in place which will allow private power projects to be financed without the need for counter guarantees. In that regard, the U.S. experience was offered.

- The United States and India will expand their cooperation in sustainable energy technology by:

  - signing the Memorandum of Understanding on Bilateral Energy Consultations;

  - developing concepts and sharing of experiences for improving the energy efficiency of the power sector and end-use efficiency in India;

  - expanding the exchange of technical personnel to gain experience in each country's energy and environmental programs, policies, and technologies;

  - exchanging information on improving the interconnection of the Indian power grid and improving the energy efficiency of transmission and distribution systems in India.

  - exchanging information on the environmental, economic, and technical aspects of hydroelectric power production with the U.S. power marketing administrations, research and development institutions and their Indian counterparts.

  - introducing clean coal technologies into the Indian power industry at pre, as well as post, combustion stages for coal combustion technologies, fly ash collection and utilization, and other advanced power systems.

B.

It was also agreed that official follow-on meetings will be held on at least a semi-annual basis and at the Cabinet level on an annual basis, to review the progress made on these and other areas of common interest.

Hazel R. O'Leary

N.K.P. Salve

13.7.94

NON-CONVENTIONAL ENERGY SOURCES AND THE US DELEGATION LED BY THE SECRETARY OF ENERGY

Ms. Hazel R. O'Leary, US Secretary of Energy, met Shri S. Krishna Kumar, Minister of State for Non-Conventional Energy Sources & Agriculture, on 12th July, 1994, alongwith their respective official and business delegations. Arising out of the common outlook of both countries on energy, environment and sustainability, they emphasised the need to strengthen cooperation in the field of renewable energy. They felt that the main purpose of the proposed cooperation should be to foster closer linkages and contacts between scientific and technological institutions, facilitate commercialisation, and encourage investments for renewable energy project development. The cooperation should provide the framework for exchange of information and personnel, joint projects, licensed production in India, joint ventures, increased trade between the two countries, and opening up of opportunities for financing and private investments.

2. It was agreed by the two sides to sign a Joint Statement of Intent for cooperation in the field of renewable energy, at the conclusion of the visit of the US Secretary of Energy to Delhi. It was also agreed to set up a Joint Committee to plan and coordinate cooperation in this area.

3. The following specific areas of collaboration were suggested by the US side, which could form the first tasks under the proposed programme of cooperation :-

- Advanced biomass gasification, where the US experience

in gasification technology for woody biomass and agro-industrial residues such as bagasse will be shared, using the 'twinning' approach, and the applicability of these particular systems to the remote energy needs in India will be explored.

- Village electrification, using the experience with Brazil and Mexico in joint project implementation, with a view to leveraging multi-lateral funding for such projects in India.

- Joint test programme to evaluate the economic feasibility of solar photovoltaic concentrators for grid-connected power generation.

- Standardisation and reliability testing to achieve full compatibility of test standards for wind turbines, solar photovoltaics, solar thermal systems, etc., and to ensure that reliability problems that have already been identified in the US are not duplicated in the deployment of systems in India.

A suggestion was made regarding inclusion of renewable energy based power components in large conventional power stations being planned, so that the financing and economics of the whole package becomes attractive. The example of solar assisted combined cycle plants was discussed. It was felt that a few such joint projects could be developed.

4. In addition, the Indian side indicated interest in the following areas :

- Joint development and commercialisation of low-speed wind turbines.

- Demonstration of advanced biomass electric conversion technologies, including state-of-the-art boilers and turbo-generators for optimal cogeneration, and producer gas fired engines.

- Solar thermal power generation, especially the US experience in operation, maintenance and grid interfacing of solar thermal power plants in California.

5. Some other specific areas of interest to India include :

- Cost-effective thin film solar photovoltaic technologies, and high efficiency power conditioning equipment.

- US experience on policy measures and regulatory mechanisms to stimulate renewable energy development.

- Evaluation of options for project financing to secure maximum international assistance, institutional finance and private investment for market based renewable energy systems.

- Ocean thermal energy conversion.

- Energy recovery from municipal and industrial wastes.

- Alternate fuels for transportation.

- Solar refrigeration.

6. The need for intensive scientific cooperation in research and development and joint technology development programmes in the renewable energy sector were emphasised to bring about technological upgradation as well as improvement of efficiencies and reduction of costs of promising technologies.

7. It was agreed to have broad-based cooperation between the Solar Energy Centre and the National Renewable Energy Laboratory of the US, including exchange of scientific information and test data. A joint programme of testing and evaluation will also be developed with the Hybrid Test Centre being established at NREL.

8. The Indian side informed the US side that a Special Cell has been set up in the Ministry of Non-Conventional Energy Sources to facilitate joint ventures in renewable energy. The Ministry has taken up with the World Bank issues pertaining to facilitating early utilisation of their lines of credit to IREDA. The Indian side also informed that certain matters pertaining to rationalisation, removal of anamolies and interpretation concerning custom tariffs for renewable energy equipment are being discussed with the concerned authorities.

9. The US Department of Energy will send a letter confirming the identified areas, after which detailed modalities of cooperation between the two sides will be worked out.

Signed in duplicate at New Delhi, India, this 13th day of July 1994.

For the Department of Energy of the United States of America :	For the Ministry of Non-Conventional Energy Sources of the Republic of India :
(HAZEL R. O'LEARY) SECRETARY OF ENERGY	(S. KRISHNA KUMAR) MINISTER OF STATE

RECORD OF MEETING ON SUSTAINABLE DEVELOPMENT AND USE OF INDIA'S NATURAL GAS AND PETROLEUM RESOURCES

Secretary of the United States Department of Energy, Hazel R. O'Leary, and Minister of State with Independent Charge for Petroleum and Natural Gas, Satish Sharma, met on July 11, 1994, in New Delhi, India. The objective of the meeting was to explore opportunities for collaboration between the United States and India and to set measurable objectives for each country to ensure that the natural gas and petroleum resources will be produced and utilized in a manner that will sustain India's environment while allowing for its economic growth. The following is a record of the meeting.

They agreed that:

- To assist India in assuring that its energy resources are used most efficiently, cleanly, and economically, U.S. assistance would be provided to the Indian energy and environmental Ministries to develop a sustainable energy strategy for India. This would include efforts to explore measures to reduce gas flaring and use this gas in demand centers.

- Advanced natural gas and petroleum exploration, production, and upgrading technology transfer from the United States to India would allow for the more efficient, environmentally sound, and economic production and use of the natural gas and petroleum resources in India.

- The most effective way to transfer technology from the United States to India is through private sector ventures between companies in India and the United States.

- To promote private sector technology transfer, decisions on natural gas and petroleum projects now being considered in India should be accelerated.

- Transfer of technology will also result from signing the Memorandum of Understanding on Bilateral Energy Consultations and the Statement of Intent to Cooperate in the Field of Fossil Energy and implementing Government-to-Government and industry-to-industry programs under those agreements.

The following areas would be the initial focus of the technology transfer program. In each area, private sector initiatives will be promoted as the highest priority. In addition, these Government-to-Government information exchanges will be initiated:

(1) Energy efficient technologies in all areas.

(2) Oil and gas exploration;

(a) technologies to develop and exploit marginal fields/abandoned fields;

(b) development in deep sea areas and sub–sea systems;

(c) development of thin oil rims;

(d) heavy oil development;

(e) quality improvement in seismic data acquisition;

(f) skid mounted or floating systems for extraction of higher fractions from natural gas/conversion of middle distillates;

(g) insitu combustion technology;

(h) thermal EOR (steam) technology;

(i) technology for development of very tight formations; and

(j) application of "FRACTALS" techniques for reservoir simulation and management.

(3) Refining

(a) It is noted that the United States has technologies to improve cracking to increase proportion of higher value distillates and reduce residues. This will be extremely useful yields of lighter products from crude oil. Alsc required in the context of our need to revamp the existing FCCs.

(b) In addition, latest technology for the manufacture of high viscosity lube oi through hydro–processing.

(4) Energy modelling: Where techniques for energy modelling including sector–wis modelling for energy planning in the country, could be advanced throug exchange of information, experts, and even training.

(5) Financial restructuring of the Public Sector Units' (PSUs) in India increas opportunities for financial services like advisors in market restructuring and acce

to overseas capital markets.

It was also agreed that follow–on meetings on at least a semi–annual basis will be held to review progress made on these and other areas of common interest.

Hazel R. O'Leary
Secretary of Energy

Satish Sharma
Minister of Natural Gas and
Petroleum and Natural Gas Resources

RECORD OF MEETING

ON

SUSTAINABLE DEVELOPMENT ON INDIA'S COAL RESOURCES

Secretary of the United States Department of Energy, Hazel R. O'Leary, and the Indian Minister of Coal, Ajit Kumar Panja, on July 11, 1994, in New Delhi, India, to undertake bilateral discussions on the subject of collaboration of sustainable energy development in India. The following is a record of that meeting.

They agreed that :

* Coal washing will remove impurities before the coal is combusted, thereby reducing air pollution, reducing transportation needs and costs, and improving boiler performance and efficiency which in turn reduces carbon dioxide emissions.

* The United States leads the World in coal washing and beneficiation technology and that the need for steam coal washeries in India is high for commercial projects by U.S. companies under the build, own, and operate (BOO) model; or under the build, own, operate, and trade (BOOT) model.

...2/-

D.

* Clean coal technologies will reduce pollution and increase the efficiency of using coal. Therefore, Research and Development collaboration between the Indian Ministry of Coal and the U.S. Department of Energy should be expanded in the areas of advanced coal beneficiation, coal gasification, coal-bed methane recovery and other clean coal technologies upon signing of the Fossil Energy Protocol of Intent.

* Partnerships between United States and Indian business and Government will accelerate the commercial use of clean coal technologies in India. A working group of U.S. and Indian government and private sector representatives will be created with the objectives of transfering advanced coal technology to India and identifying commercial project opportunities for U.S. companies in India.

* There is interest in India for coal-bed methane recovery to protect the environment, produce a valuable energy resource and to protect coal mines. U.S. companies with expertise in coal-bed methane recovery will be encouraged to pursue commercial projects with the Ministry of Coal.

...3/-

* U.S. coal producers and mining equipment manufacturers will be encouraged to work with the Ministry of Coal of India to characterize and develop deep coal deposits in India through underground coal mining techniques.

* Regulatory and other barriers to investment will inhibit the use of advanced coal technologies in India. Therefore, these barriers will be reviewed and dealt with by the Ministry of Coal. U.S. companies were urged to bring to the attention of the Ministry specific problems they confronted.

At a follow-on meeting between the U.S. Department of Energy, Hazel R. O'Leary, Indian Minister of Coal, Ajit Kumar Panja and private sector representatives from the U.S. Presidential Mission on sustainable Development, it was agreed that :

* The Indian Ministry of Coal be contacted by U.S. companies having an interest in building coal washing facilities to obtain information on India's coal washing plants.

...4/-

* The Ministry of Coal will work closely with U.S. Department of Energy, the U.S. - Asia Environmental Partnership (U.S.-AEP) and U.S. companies to promote Indo-U.S. joint ventures established to develop commercial coal preparation projects.

* The U.S. Department of Energy, with assistance from the U.S. - Asia Environmental Partnership, will help U.S. companies mobilize public and private financing for coal preparation project proposed under the BOO and BOOT models.

* The Indian Ministry of Coal will assist any U.S. company who has problems obtaining firm commitments to transport coal in India.

* The Indian Ministry of Coal will accelerate their review of allowing the cost of coal washing to be passed through to end user.

* Although much progress has been made to reduce the import tariffs on coal preparation and coal-bed methane recovery test equipment, the Ministry of Coal will review the tariffs to determine if they should be further reduced.

...5/-

* The U.S. Government and Industry will work with India to assess the potential of coal-bed methane recovery from deep seams.

It was also agreed that a meeting between Indian Ministry of Coal and U.S. Department of Energy officials to review the progress made on these and other issues of common interests would be held on a semi-annual basis.

New Delhi, India, 13th July, 1994.

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

(AJIT KUMAR PANJA)
MINISTER OF STATE FOR COAL

FOR THE MINISTRY OF COAL OF THE REPUBLIC OF INDIA

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE GOVERNMENT OF THE UNITED STATES OF AMERICA

(DEPARTMENT OF ENERGY)

AND

THE GOVERNMENT OF INDIA

(MINISTRY OF POWER)

PREAMBLE

The Government of India, Ministry of Power, hereinafter called Ministry of Power and the Government of United States of America, Department of Energy, hereinafter called the Department of Energy desirous of conducting bilateral energy consultations have agreed as follows:

ARTICLE I

Within the framework of common interest and mutual benefit of both countries, the U.S. Department of Energy and the Ministry of Power have agreed to establish a sub-ministerial working group on energy which will conduct energy consultations between the two agencies (hereinafter referred to as the "Group"). The purpose of this group is to enhance the understanding of energy issues and to promote the exchange of information on energy policies, programmes and technologies by consultations.

E

ARTICLE II

The objective of this group include consultations:

A) To discuss current and prospective energy developments in both countries, the Asia region and the world at large.

B) To facilitate an exchange of information and assessments on energy demand and supply forecasts for the two countries.

C) To exchange views on energy and related environmental policies, including global climate change, and to discuss programmes of both countries relating to the exploration, development, management, and environmental concerns of major energy resources including renewable energy resources and to the efficient and environmental responsible transport and use of energy.

D) To review and exchange information on energy technologies including renewable energy technologies and applied energy research and development.

ARTICLE III

For the purpose of promoting closer contacts and mutually beneficial consultations, the arrangements for the group's meeting will be as follows:-

A) The group will consist of senior sub-ministerial officials from the U.S. Department of Energy and

JOINT STATEMENT OF INTENT
BETWEEN
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND
THE MINISTRY OF COAL OF THE REPUBLIC OF INDIA
TO COOPERATE IN THE FIELD OF FOSSIL ENERGY

Whereas, the Department of Energy of the United States of America (DOE) and the Ministry of Coal of the Republic of India, hereinafter referred to as the Participants, have a mutual interest in exchanging experience and views on opportunities for expanded fossil energy utilization, including clean coal and coal-bed methane technologies, and in pursuing collaboration between their two countries in this area;

Whereas, the Participants recognize the contribution of fossil fuel technologies, including clean coal and coal-bed methane recovery and utilization technologies, to fuel diversity, to enhance mutual environmental protection and energy security, and to expand opportunities for international trade; and

Whereas, the Participants will mutually benefit from collaboration in the deployment and use of fossil fuel technologies.

.....2/-

Whereas, the Participants recognize that implementation of any collaborative fossil energy activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, under negotiation, and of a fossil energy implementing arrangement between the Participants.

The Participants declare their intention to cooperate in a manner which will facilitate joint activities and market deployment of fossil energy technologies in an environmentally responsible way. These intended joint activities may include, but will not be limited to:

(1) Consultations by senior program officials to permit joint planning of joint projects in which participating organizations agree to share the tasks, the costs, or both. Each such project shall be the subject of a separate project agreement;

(2) Exchange of publicly available technical and economic data, including data on cost-effective clean coal, coal-bed methane recovery, and coal mining health and safety technological options;

...3/-

the Ministry of Power. Other agencies and entities may be invited to participate in the consultations as appropriate.

B) The U.S. Department of Energy and the Ministry of Power will each appoint an official who will make preparations for the meeting and who will have responsibility for maintaining mutual contact during the time when meetings are not held.

ARTICLE IV

The work programme of the group will be guided by the following procedures:

A) The meeting will be held periodically, usually on an annual basis, alternately in the United States and India.

B) Special meetings may be held if both the U.S. Department of Energy and the Ministry of Power so decide.

C) The dates of the meetings will be determined at least one month in advance pursuant to discussions between the U.S. Department of Energy and the Ministry of Power.

D) The subjects to be discussed at the meetings will be mutually determined by the U.S. Department of Energy and the Ministry of Power.

ARTICLE V

These consultations will be held in accordance with the laws and regulations in the United States and India.

ARTICLE VI

These consultations will not affect existing arrangements in place or under discussion between the U.S. Government and the Government of India organisations, or involving the U.S. Department of Energy and the Ministry of Power.

ARTICLE VII

Consultations under this Memorandum of Understanding shall cease five(5) years after the date of signature, unless the U.S. Department of Energy and the Ministry of Power decide in writing that continued consultations would be beneficial.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994.

For the Department of Energy
of the United States of America

(HAZEL R. O' LEARY)
SECRETARY OF ENERGY

For the Ministry of Power
of the Govt. of India

(N.K.P. SALVE)
MINISTER OF POWER

13.7.94

JOINT STATEMENT OF INTENT

BETWEEN THE

DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

AND THE

MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES

OF THE REPUBLIC OF INDIA

F.

The Department of Energy of the United States of America and the Ministry of Non-conventional Energy Sources of the Republic of India (The "Energy Agencies") have reached general agreement on the following elements which they intend to include in an Implementing Arrangement which will be subject to the Agreement between the Government of the United States of America and the Government of India on Cooperation in Science and Technology, which is currently under negotiation. This proposed Implementing Arrangement provides for cooperation in the field of renewable energy and will be finalized upon entry into force of the aforementioned US-India Science and Technology Agreement:

1. The Energy Agencies intend to facilitate and establish cooperative activities in the field of renewable energy research, development and commercialization that are of programmatic benefit to the Energy Agencies; such activities are to be conducted on the basis of mutual benefit to the two countries, equality and reciprocity;

2. Cooperation in accordance with the proposed Implementing Arrangement may include exchange of personnel, samples, materials, instruments and components for testing, and scientific and technical information, as well as the organization of and participation in seminars and projects and such other specific forms of cooperation as may be mutually agreed by the energy agencies;

3. The energy agencies intend to establish a Joint Committee on Scientific Cooperation in Renewable Energy (Joint Committee), to meet alternately in the United States and India; this Joint Committee is to plan and coordinate cooperation in renewable energy;

4. If the Co-Chairmen of the Joint Committee decide that a joint project shall be established under the proposed Implementing Arrangement, a project agreement shall be executed which shall include detailed provisions for carrying out the joint project to which it applies and cover such matters as technical scope, exchange of proprietary information, patents, project management, exchange of equipment, and personnel, total costs, cost sharing, and project schedule;

5. Any exchange of personnel shall be mutually agreed in advance by the Energy Agencies through an exchange of letters and, in each case, the Energy Agencies shall ensure the selection of adequate personnel with skills and competence necessary to conduct the activities planned;

6. The Energy Agencies recognize that implementation of any renewable energy activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, under negotiation, and of a renewable energy Implementing Arrangement between the Participants.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

FOR THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES OF THE REPUBLIC OF INDIA:

(S.KRISHNA KUMAR)
MINISTER OF STATE

(3) Joint technical evaluation of fossil energy technology parameters, including advanced clean coal utilization parameters;

(4) Technology demonstrations, including demonstration of the use of state-of-the - art technologies for methane utilization;

(5) Exchange visits to mutually agreed upon U.S. and Indian commercial and clean coal technology research, development, and demonstration program facilities;

(6) Training and internship program support for personnel in related fossil energy technologies to strengthen related human resources and institutional infrastructure and facilitate joint government/industry activities;

(7) Joint development of technical assistance programs to facilitate industrial partnerships between fossil energy industries in the U.S.and India;

....4/-

(8) Concluding appropriate agreements for planning, screening studies, design, financing, constructing, and operating clean coal technology demonstration plants or research and development projects.

Activities undertaken under this statement of intent may be implemented by the joint efforts of the Participants or their designees. The United States Department of Energy intends that the Office of Fossil Energy, in cooperation with the U.S. Agency for International Development, its bilateral mission in India, and the United States Asia Environmental Parternship, will implement this cooperation. The Indian Ministry of Coal intends that the agencies designated by it will implement this cooperation. Neither side will implement this Joint Statement until after the conclusion of an Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology.

.....5/-

All costs resulting from this intended cooperation shall be borne by the Participant that incurs them, unless otherwise agreed to in writing.

New Delhi, India, 13th July,1994.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

FOR THE MINISTRY OF COAL OF THE REPUBLIC OF INDIA

JOINT STATEMENT OF INTENT

BETWEEN THE

MINISTRY OF ENVIRONMENT AND FORESTS

OF THE REPUBLIC OF INDIA

AND THE

DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

TO COOPERATE IN ENVIRONMENT ENHANCING ENERGY TECHNOLOGIES

WHEREAS, the Department of Energy of the United States of America (DOE) and the Ministry of Environment and Forests (MOEF) of the Republic of India, hereinafter referred to as the Participants, have a mutual interest in working together and consulting to facilitate planning, development and implementation of energy technology cooperation projects in India that result in improved environmental attributes, reduction in net emissions of greenhouse gases, and improved production technology, and in pursuing collaboration between their two countries in this area.

WHEREAS, the Participants recognize that enhancing mutual environmental protection, particularly controlling greenhouse gas emissions to limit potential adverse climate change impacts, requires a global solution, to which both our countries have opportunities to make significant but differential contributions.

WHEREAS, the Participants recognize that many methods and technologies that limit greenhouse gas emissions contribute also to economic development and the control of local and

regional environmental problems, and that cost-effective, world-wide greenhouse gas emission reductions may be achieved by encouraging such reductions where responsive solutions are available at least cost with possible financial and technical assistance from individuals and organizations.

WHEREAS, the Participants recognize that the Framework Convention on Climate Change, Agenda 21, and other international agreements, to which both our countries are signatories, encourage countries to implement cooperative, mutually voluntary projects, particularly technology cooperation projects as an important means to accelerate progress along a sustainable development path and maintain strong and sustainable economic growth.

WHEREAS, the Participants recognize that implementation of any environment-enhancing energy activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, to be agreed between the United States and India.

WHEREAS, the Participants will mutually benefit from collaboration in the deployment and use of environment enhancing and greenhouse gas emission reduction technologies.

1.) THE PARTICIPANTS declare their intention to cooperate in a manner which will facilitate bilateral activities and market deployment of environment enhancing energy technologies, particularly greenhouse gas-reducing technologies. These intended bilateral activities, to be carried out under a Memorandum of Understanding may include, but are not to be limited to:

(A) Consultations by senior program officials to permit planning of bilateral projects and to facilitate agreement by participating organizations on the opportunities for and solutions to the barriers to development of cooperative activities, including integrated resource planning, to promote sustainable development;

(B) Bilateral technical evaluation of projects that are likely to meet the criteria for project selection being developed by the Conference of the Parties of the United Nations Framework Convention on Climate Change, including development of a model statement of acceptance by India for technology cooperation projects;

(C) Exchange of publicly available technical and economic data, including data on cost-effective greenhouse gas emission reduction, improved energy efficiency, and commercial energy technological options, that enhance the environment and contribute to achieving sustainable development;

(D) Bilateral development of information systems, including application of telecommunications, computer systems and support systems such as internet, to foster new technology cooperation initiatives and to support information requirements on energy technology cooperative projects;

(E) Bilateral support of other potential and existing technology cooperative and technology transfer projects beneficial to both our countries' non-government and commercial interests; and

(F) Training and internship program support for personnel in related energy technologies to strengthen related human resources and institutional infrastructure and facilitate bilateral government/industry activities.

2.) THE PARTICIPANTS declare their intention that a Memorandum of Understanding to implement this Joint Statement of Intent will provide that all costs resulting from this cooperation shall be borne as mutually agreed.

3.) The MOU to implement this Joint Statement will not take effect until after the conclusion of an Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994

For the Ministry of Environment and Forests of the Republic of India:

(KAMAL NATH)
MINISTER OF STATE

For the Department of Energy of the United States of America:

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

JOINT STATEMENT OF INTENT

BETWEEN

THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA

AND

THE MINISTRY OF POWER OF THE REPUBLIC OF INDIA

TO COOPERATE IN THE FIELD OF ENERGY EFFICIENCY

WHEREAS, the Department of Energy of the United States of America (DOE) and the Ministry of Power of the Republic of India, hereinafter referred to as the Participants, have a mutual interest in exchanging experience and views on opportunities for improving energy efficiency, including demand-side management and cogeneration, and in pursuing collaboration between their two countries in this area; and

WHEREAS, the Participants recognise the contribution of energy efficiency technologies, including demand-side management and cogeneration, to enhancing mutual environmental protection and energy security, and expanding opportunities for international trade;

WHEREAS, the Participants recognise that implementation of any collaborative energy efficiency activities will be pursuant to the Agreement between the Government of the United States of America and the Government of the Republic of India on Cooperation in Science and Technology, under negotiation, and of an Energy Efficiency Implementing Arrangement between the Participants.

The Participants declare their intention to cooperate in a manner that will facilitate joint activities and commercial development and deployment of environmentally sound, energy-efficient technologies. These intended joint activities may include:

4

(1) Joint technical evaluations of the potential for electrical and thermal end-use energy efficiency, including integrated resource planning in utilities;

(2) Technology demonstrations, including pilot demonstration projects in demand-side management, cogeneration and other state-of-the-art technologies for efficient energy utilization;

(3) Joint development of information exchange networks that permit availability, accessibility and acceptability of high quality energy technology, policy and regulatory information;

(4) Training and internship programme support for personnel in related energy efficiency technologies to strengthen related human resources and institutional infrastructure and facilitate joint government/industry activities in market conditioning and standards setting as well as in science and technology;

(5) Sharing experience in defining and implementing national and state government roles in supporting technology innovation and deployment;

(6) Technical assistance programmes to promote the development of energy service companies established through partnerships between U.S. and Indian public and private sector entities;

(7) Concluding appropriate agreements for planning, design, financing, constructing and operating cogeneration technology demonstration plants or

energy efficiency technology applicantion projects; and

(8) Coordination with multilateral development banks in the design, development and financing of energy efficiency programmes and projects.

Implementation of above collaborative energy efficiency activities, listed above, is pursuant to and contingent upon the successful conclusion of an agreement between the Government of the Republic of India and the Government of the United States of America on Cooperation in Science and Technology. The Participants intend the activities undertaken under this Joint Statement of Intent to be coordinated by the joint efforts of the designees of the Participants.

All costs resulting from this intended cooperation shall be borne by the Participants that incur them, unless otherwise agreed to in writing.

Signed in duplicate at New Delhi, India, this 13th day of July, 1994.

For the Department of Energy
of the United States

(HAZEL R. O'LEARY)
SECRETARY OF ENERGY

For the Ministry of Power
of the Republic of India

(N.K.P. SALVE)
MINISTER OF POWER

13/7/94

PROTOCOL OF INTENT
BETWEEN
THE UNITED STATES DEPARTMENT OF ENERGY AND THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
AND
THE MINISTRY OF POWER OF THE GOVERNMENT OF INDIA AND THE NATIONAL THERMAL POWER CORPORATION LIMITED, INDIA

1.0 *It is the intent of the U.S. Department of Energy* (USDOE) *and the National Thermal Power Corporation Limited of India* (NTPC) *to establish long term technical cooperation programmes aimed at improving the efficiency of power generation and attainment of sustainable energy development in India.*

2.0 NTPC, *the largest power utility in India, with over* 14500 MW *of operational thermal capacity, has established a* ***Centre for Power Efficiency and Environmental Protection*** *at its Research and Development Complex in NOIDA, India, which the* USDOE *and the U.S. Agency for International Development* (USAID) *intend to support through technical assistance and transfer of advanced leading edge technology for improvement in performance of the Indian Power Sector.*

3.0 *It is also the intent of* USDOE *and* USAID *to help introduce new and qualitatively better generation technologies through association with the* Ministry of Power/NTPC, *with a view to bringing down the greenhouse gas emissions per energy unit generated and also to reduce environmental impact and degradation.*

4.0 *It is intended that the areas of mutual cooperation and interests for technical assistance and technology transfer would be identified and reviewed from time to time so as to achieve maximum benefits to the Indian Power Sector.*

(Jack Siegel)	(W. Bollinger)	(R.K.Nair)	(Rajendra Singh)
USDOE	USAID	MOP	NTPC

(Signed on 13th Day of July 1994 at New Delhi in Presence of Ms. Hazel R. O'Leary, Secretary of the United States Department of Energy and Mr. R. Vasudevan, Secretary, Ministry of Power, Government of India)

APPENDIX 2.

SESSION SUMMARY: INDO/U.S. PARTNERSHIP FOR THE FUTURE

A round-table session on "Partnerships for a Sustainable Energy Future" produced an action plan supported by government representatives, businesses and environmental groups. The group's plan will:

1. Develop an action plan for "twinning" demonstration projects linked to the U.S. Climate Change Action Plan. The plan relies on voluntary industry efforts to reduce greenhouse gas emissions and the commercialization of new technologies. Both of these elements could be "twinned" with Indian industry counterparts through technology demonstrations, partnerships, and technology transfer including management, process, and policy innovations in cooperation with government and non-government organizations (NGO).

2. Establish an efficiency and renewable energy task force to accelerate the utilization of efficiency and renewable energy technologies drawing on relevant U.S. experience. Renewable and efficiency endeavors should be focused on the electric power, industrial, and transport sectors.

   a. Charge the task group with identifying barriers to penetration and recommending remedial actions. The import duty structure which adversely affects renewable energy technologies (due to their capital intensive nature) and the development of markets to scale-up manufacturing of photovoltaics, wind, cogeneration turbines, and batteries also needs to be reviewed.

   b. Charge the task group to evaluate alternative mechanisms for large block power purchases targeted from renewables, conservation, solar-assisted gas-fired plants, and other hybrid renewable-fossil fuel plants and demand-side management demonstrations. These alternatives should include an examination of incentives for energy service companies particularly integrated energy services. Identify and evaluate model projects for implementation by NGOs and industries facilitated by State Electricity Boards.

   c. Charge the task group with ensuring that the availability of fuel to the poor is not adversely affected by the development of renewable resources, notably biomass.

3. Bilaterally develop an action plan drawing upon each country's experiences to explore strategies for improving the ability of Indian utility systems to meet financial, environmental, and consumer needs through improved planning, operations, management,

and financial accounting as well as the development of a regulatory structure that integrates tariff-making, integrated resource planning, and public participation.

a. Form a bilateral team to produce a model integrated resource planning system tailored to Indian conditions with an explicit implementation strategy.

b. Form a bilateral team to develop market promotion strategies for grid-connected industrial cogeneration systems.

c. Form a bilateral team for the development of demand-side management programs and strategies in Indian utilities to reduce peak capacity shortages and improve end-use efficiency.

d. Form a bilateral team to develop and programs for the reduction of transmission and distribution losses.

e. Consider forming a team to work with State Pollution Control Boards to monitor emissions and compliance with pollution control standards.

4. Bilaterally develop an action plan drawing upon each country's experiences to explore strategies for the reduction of natural gas flaring and for the capture and utilization of coal-bed methane. Engage in joint strategic studies on integrated resource options for India including oil and gas exploration and development, gas importation, efficiency, renewable energy and other clean combustion technologies. These studies should, in particular, relate to India's goal of installing 2,000 MW of renewable energy, and they include the environmental implications and costs of all alternatives. Particular attention should be paid to the problem of fly ash disposal.

5. Establish a task force that will focus on the delivery of reliable, safe, environmentally sound and economical power to rural consumers including the promotion of viable decentralized generation (with distribution), through the private sector, jointly, and/or through cooperatives.

6. Continue an active dialog between the financial community members of the U.S. business delegation and their Indian business counterparts on the subject of financial incentives for sustainable development. Further, the U.S. financial community members will return to India within six months and meet with the Confederation of Indian Industry's Committee on Private Industry Participation in the Power Sector.

7. Create an Indo/U.S. Committee on the Energy Aspects of Sustainable Development within the framework of the existing Indo/U.S. Joint Commission to include membership from government, industry, and NGOs. The committee will assemble bilateral teams for

follow-on action items 1-5 who will develop and report a plan of work within six months.

In addition, the session on *Indo/U.S. Partnership for the Future* brought out a number of valuable observations, including:

- The importance of broadening the composition of delegations and follow-on teams to include representatives of state governments from both India and the U.S.;

- The importance of ensuring near-term success to sustain this new partnership, which could be accomplished by targeting an existing project or by identifying model projects for start-up cost-sharing funds by government;

- The importance of ensuring that any follow-on actions are generally bilateral with a fully bi-directional exchange of experiences, personnel, and opportunities;

- The value of broad-based teams involving government, industry, and non-governmental environmental groups;

- The need to evaluate and streamline policies for renewables to include those of the multi-lateral lending institutions with an emphasis on conservation;

- A proposal for a joint working group specifically on coal to focus on mining, washing and methane capture as well as improving the efficiency of coal-based energy systems at every stage was emphasized.

APPENDIX 3.

US DOE INDIA BUSINESS/GOVERNMENT DELEGATION LIST

Ms. Nancy M. Bacon
Senior Vice President, Government Contracts
and International Projects
Energy Conversion Devices, Inc.
1675 West Maple Road
Troy, MI 48084
810/280-1900
810/280-1456 (fax)

Mr. Dennis W. Bakke
President & CEO
The AES Corporation
1001 N. 19th Street, Suite 2000
Arlington, VA 22209
703/353-0509 703/522-1315
703/528-4510 (fax)

Ambassador Harry Barnes, Jr.
Senior Fellow
World Wildlife Fund USA
c/o Hapenney Road
Peacham, VT 05862
802/592-3206
802/592-3206 (voice and fax)

Mr. Scott Bayman
President and CEO, GE India
GE International Operations Co.
International Trade Tower, 14th Floor
Nehru, New Delhi
India
91-11-642-8001
91-11-646-7045 (fax)

Ms. Deborah L. Bleviss
International Institute for Energy
Conservation
750 First Street, NW, Suite 940
Washington, DC 20002
202/842-3388
202/842-7565 (fax)

Mr. William H. Cavitt
Department of Commerce
International Economic Policy - Canada Ofc
14th and Constitution Avenue, NW
Room 3033
Washington, DC 20230
202/482-3103
202/482-4736 (fax)

Ms. Eileen Claussen
Special Assistant to the President and
Senior Director for Global and
Environmental Affairs
National Security Council
1600 Pennsylvania Avenue, NW, Room 365
Washington, DC 20500
202/395-4985
202/456-2219 (fax)

Mr. Charles T. Condy
President and CEO
Proven Alternatives, Inc.
601 California Street, #2200
San Francisco, CA 94108
415/781-2001
415/781-0552 (fax)

rev. 8/1/94

Mr. James W. Cook
President & CEO
CMS Generation Company
Fairlane Plaza South
330 Town Center Drive, Suite 1000
Dearborn, MI 48126
313/436-3242
313/436-9533 (fax)

The Honorable E. Gail de Planque
Commissioner
U.S. Nuclear Regulatory Commission
Mail Stop 16H3
Washington, DC 20555
301/504-1800
301/504-3509 (fax)

Dr. Subhash Dhar
President
Ovonic Battery Company
1707 Northwood
Troy, MI 48084
810/362-1750
810/362-0332 (fax)

Mr. Dan Dudek
Senior Economist
Environmental Defense Fund
257 Park Avenue South
New York, NY 10010
212/505-2100
212/505-2375 (fax)

Dr. Sonja Ebron
President
Solar Power & Light, Inc.
2267 Macedo Road
Palm Bay, FL 32907
407/723-4404 (voice and fax)

Mr. Robert H. Eggleston
President
EFH Coal Company
North American Division
P.O. Box 669
Mars, PA 16046
717/823-7664
717/829-4515 (fax)

Mr. Charles F. Goff
President & Chief Executive Office
Destec Energy, Inc.
2500 Citywest Boulevard, Suite 150
Houston, TX 77042
713/735-4209
713/735-4208 (fax)

Ms. Lisa R. Gued
Vice President
Solar Power & Light, Inc.
2267 Macedo Road
Palm Bay, FL 32907
407/723-4404 (voice and fax)

Mr. Robert Halligan
Administrator, International Programs
National Rural Electric
Cooperative Association
1800 Massachusetts Avenue, NW
Washington, DC 20036-1883
202/857-9686
202/857-4863 (fax)

Mr. Walter J. Hesse
President & CEO
ENTECH, Inc.
P.O. Box 612246
DFW Airport, TX 75261
214/456-0900
214/456-0904 (fax)

Mr. Louis Martarano
Director, Strategic Advisory Services, Global Power
Merrill Lynch & Co.
250 Vesey Street
World Financial Center
New York, NY 10281
212/449-1287
212/449-8636 (fax)

Ms. Linda A. Marvin
Acting President
Lockheed Environmental Systems and Technologies Company
Citicorp Center
1200 Smith Street, Suite 800
Houston, TX 77002-4309
713/654-4830
713/654-4850 (fax)

Mr. Peter McChesney
Director of Business Development
Community Energy Alternatives
1200 East Ridgeview
Ridgeview, NJ 07540
201/652-2772
201/652-8354 (fax)

Ms. Janet McFarland
Senior Policy Advisor to the Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
202/260-1634
202/260-5155 (fax)

Mr. Brian J. O'Sullivan
Manging Director
Cannon Power Corporation
P.O. Box 1457
Tehachapi, CA 93581
805/822-7524
805/822-8394 (fax)

Dr. Lawrence T. Papay
Senior Vice President & Manager of Research & Development
Bechtel Group, Inc.
50 Beale Street
San Francisco, CA 94105-1895
415/768-0275
415/768-0503 (fax)

Mr. Daniel Radack
Manager, International Business Development
SRC International
111 Presidential Boulevard, Suite 127
Bala Cynwyd, PA 19004
610/667-2160
610/667-5593 (fax)

Dr. A.V. Mohan Rao
Vice President, Marketing
Spectrum Power Generation, Ltd.
133 Wall Street
Schenectady, NY 12305
518/382-0056
518/382-0283 (fax)

Mr. Lewis Reade
Director General
U.S. - Asia Environmental Partnership
320 21st Street, NW
Room 3319
Washington, DC 20523-0047
202/647-9969
202/647-4921 (fax)

Dr. George Roland
President and CEO
Siemens Solar Industries
4650 Adohr Lane
Camarillo, CA 93012
805/482-6880
805/388-6395 (fax)

rev. 8/1/94

Mr. Harvey A. Himberg
Investment Development Department
Overseas Private Investment Corporation
1100 New York Avenue, NW
Washington, DC 20527
202/336-8614
202/408-5145 (fax)

Mr. David Jhirad
Agency for International Development
New Executive Office Building
Examiners & Staff Specialists
Washington, DC 20503
202/395-4594
202/395-3888 (fax)

Mr. Paul C. Johnson
President, South Asia Region
Martin Marietta International, Inc.
240 Tanjong Pagas Road
GE Tower #08-00
Singapore 0208
65-328-3365
65-326-3378 (fax)

Mr. Ramesh Kapur
MED-TECH Medical-Technical Gases
20 Hall Street
Medford, MA 02155
617/395-1946
617/395-9098 (fax)

Martin Klepper, Esquire
Partner
Skadden, Arps, Slate, Meagher & Flom
1440 New York Avenue, NW
Washington, DC 20005
202/371-7120
202/393-5760 (fax)
617/395-9098 (fax)

Mr. Vello A. Kuuskraa
President
Advanced Resources International, Inc.
1110 North Glebe Road, Suite 600
Arlington, VA 22201
703/528-8420
703/528-0439 (fax)

Mr. Roger G. Little
President
Spire Corporation
One Patriots Park
Bedford, MA 01730-2396
617/275-6000
617/275-7470 (fax)

Reinier H.J.H. Lock, Esquire
LeBoeuf, Lamb, Greene & MacRae
1875 Connecticut Avenue, NW
Washington, DC 20009-5728
202/986-8024, x8128
202/986-8102 (fax)

Arjun Makhijani, Ph.D.
President
Institute for Energy
and Environmental Research
6935 Laurel Avenue
Takoma Park, MD 20912
301/270-5500
301/270-3029 (fax)

Ms. Amal M. Mansour
Chairman of the Board and CEO
Manufacturing & Technology Conversion
International, Inc.
5570 Sterret Place, Suite 206
Columbia, MD 21044
410/730-0445 301/982-1292 (metro)
410/997-6980 (fax)

rev. 8/1/94

Ms. Ellen S. Roy
Vice President of Government Relations
Intercontinental Energy Group
350 Lincoln Place
Hingham, MA 02043
617/749-9800
617/740-1281 (fax)

Mr. Fred C. Schulte
President and CEO
Elgin National Industries
120 South Riverside
Chicago, IL 60606-3919
312/454-1900
312/236-2668 (fax)

Mr. Niranjan S. Shah
CEO
Globetrotters Engineering Corporation
300 S. Wacker Drive, Suite 200
Chicago, IL 60606
312/922-6400
312/922-2953 (fax)

Mr. Ishaq Shahryar
President
Solec International, Inc.
12533 Chadron Avenue
Hawthorne, CA 90250
310/970-0065
310/970-1065 (fax)

George J. Sterzinger, Esquire
Manager, Biomast to Energy Division
Future Energy Resources Company
1615 M Street, NW, Suite 800
Washington, DC 20036
202/467-6370
202/467-6379 (fax)

Mr. Carlton Stoiber
Director, Office of International Programs
U.S. Nuclear Regulato5ry Commission
Mail Stop 17F2
Washington, DC 20555
301/504-1780
301/504-2400 (fax)

Mr. Richard L. Thompson
Chief Executive, Engine Division
Caterpillar Inc., Engine Division
P.O. Box 610
Mossville, IL 61552-0610
309/578-8001
309/578-2510 (fax)

Mr. Terence H. Thorn
Sr. Vice President, Government Affairs
Enron Corp.
1400 Smith Street
Houston, TX 77023-7269
713/853-3071
713/853-3129 (fax)

Mr. Charles A. Trabandt
Chairman, Strategic Advisory Services,
Global Power
Merrill Lynch & Co.
250 Vesey Street
World Financial Center
New York, NY 10281
212/449-9793
212/449-8636 (fax)

Mr. Thomas Wilbanks
Oak Ridge National Laboratory
P. O. Box 2008
Oak Ridge, TN 37831
617/574-5517

Appendix 4.

Thursday, July 7, 1994

8:30 - 9:00 am	Arrival and luggage check-in
9:00 - 10:30 am	Pre-Trip Briefing and Coffee Location: Department of Energy Room 8E-089
10:30 - 11:00 am	Break
11:00 am	Depart Department of Energy enroute Andrews Air Force Base on Department of Energy Bus
11:30 am	Arrive Andrews Air Force Base
12:30 pm	Depart Andrews Air Force Base enroute Shannon, Ireland

Friday, July 8, 1994

12:00 am	Arrive Shannon, Ireland
2:00 am	Depart Shannon, Ireland enroute Cairo Egypt
11:00 am	Arrive Cairo, Egypt
1:00 pm	Depart Cairo, Egypt enroute New Delhi, India
6:30 pm	Arrive New Delhi, India
7:10 pm	Depart Airport enroute Sheraton Tower Hotel, New Delhi (transportation provided)
7:30 pm	Arrive Sheraton Tower Hotel, New Delhi

Saturday, July 9, 1994

10:00 - 2:00 pm	POD Meetings	
2:00 - 2:45 pm	Business Delegation Meeting	
	Location:	Sheraton Hotel Bali Hi Room
3:00 - 5:30 pm	Welcome Tea Tasting: Initial In-Country Team Briefing hosted by Assam Company, Tea Exporter	
	Location:	U.S. Embassy, Roosevelt House
6:00 - 8:00 pm	Dinner hosted by Chadbourne and Parke	
	Location:	Sheraton Hotel

Sunday, July 10, 1994

Morning Option 1 -- Dadri Power Plant Tour

8:00 am	Depart for Power Plant
8:00 - 11:30 am	Tour Dadri Power Plant
11:30 am	Arrive Sheraton Hotel Lobby

Morning Option 2 -- Bus Tour of New Delhi

9:30 am	Depart for City Tour
9:30 - 11:30 am	Tour of Old Delhi and Red Fort
11:30 am	Arrive Sheraton Hotel Lobby

Morning Option 3 - Energy Pod Meeting

8:00 am Energy Efficiency Pod Meeting

Location: 14th Floor Executive Lounge

11:30 - 12:15	OPEN
12:15 pm	Depart for Welcome Luncheon hosted by Minister Salve
12:30 pm	Arrive at Welcome Luncheon
	Location: Taj Man Singh Hotel
12:30 - 2:30 pm	Welcome Luncheon
2:30 pm	Depart Welcome Luncheon
2:45 pm	Arrive Sheraton Hotel Lobby

3:00 - 3:45 OPEN

3:00 - 3:45 Environment Pod Meeting

4:00 pm	Depart for Airport enroute Agra
4:30 pm	Depart New Delhi Airport enroute Agra
5:00 pm	Arrive Agra Airport
5:15 - 5:45 pm	Tour Agra Fort
6:00 - 7:00 pm	Tour Taj Mahal
7:30 pm	Depart Agra Airport enroute New Delhi
8:00 pm	Arrive New Delhi Airport
8:30 pm	Arrive Sheraton Hotel

Monday, July 11, 1994

8:45 am	Depart for U.S. Embassy
9:00 am	Arrive at U.S. Embassy
9:00 am	Briefing by American Companies Active in India
	Location: U.S. Embassy, Roosevelt Room

Option 1 -- Briefing by American Companies		Option 2 -- Government Roundtable Meeting	
9:00 - 11:00	Briefing by American Companies Active in India	10:30	Depart for Vigwat Bhayan
11:00 am	Depart U.S. Embassy	11:00	Government to Government Roundtable Meeting
11:15 am	Arrive Sheraton Hotel		Location: Vigwat Bhayan, Rm #3
11:00 - 12:15	OPEN	12:15	Depart Vigwat Bhayan

12:15 pm	Depart enroute Confederation of Indian Industry Luncheon
12:45 - 2:15 pm	Confederation of Indian Industry Luncheon
2:15 pm	Depart Luncheon for Hotel
2:45 pm	Depart Hotel for Vigwat Bhawan
3:00 - 3:45 pm	Roundtable with Secretaries of Five Energy Ministries
	Location: Vigwat Bhawan, Room #3
3:45 pm	Depart for meeting with Minister of Petroleum and Natural Gas Sharma
	Location: Shastri Bhawan, Room 201, Gate 4
4:00 - 4:20 pm	Meeting with Minister of Petroleum and Natural Gas Sharma
4:25 pm	Depart for meeting with Minister of Coal Panja
4:35 - 5:30 pm	Meeting with Minister of Coal Panja
5:30 pm	Depart for Hotel
5:45 pm	Arrive Hotel
6:00 - 7:00 pm	Delegation Meeting
7:15 pm	Depart Hotel for U.S. Embassy, Roosevelt Room
7:30 - 9:30 pm	Reception hosted by Secretary O'Leary

Tuesday, July 12, 1994

9:15 am	Depart Hotel enroute Taj Hotel	
	Location:	Sheraton Hotel Lobby
9:30 - 12:30 pm	Indo/U.S. Energy Summit: Cooperation for Sustainable Development	
	Location:	Taj Hotel
12:30 - 1:30 pm	Indo/U.S. Energy Summit Luncheon	
	Location:	Taj Hotel
1:30 - 6:00 pm	Breakout Sessions	
6:10 pm	Depart Energy Summit enroute Sheraton Hotel	
6:20 - 8:00 pm	OPEN	
8:00 pm	Depart Hotel for Dinner hosted by Rama Goenka	
10:30 pm	First Bus returns to Sheraton Hotel	
11:00 pm	Second Bus returns to Sheraton Hotel	

Side Meeting for Tuesday, July 12

Renewables Breakfast with Minister Kumar

8:00 - 9:00 am	Breakfast with Minister Kumar and Secretary O'Leary	
	Location:	Bali Hi Restaurant, Top Floor Sheraton Hotel
9:15 am	Depart Sheraton Hotel and join page 1 Schedule	

Side Trips for Tuesday, July 12

Side Trip #1: Visit to Ministry for Non-Conventional Energy Sources Solar Facility and Tata Energy Research Institute Campus

1:30 pm	Depart Taj Hotel enroute Solar Facility
2:00 - 2:30 pm	Visit Ministry for Non-Conventional Energy Sources Solar Facility
	Program: Tour and Signing of Announcements -- Entech and Spire
2:35 pm	Depart enroute Teri Campus
2:45 - 3:30 pm	Visit Teri Campus
3:15 pm	Depart Teri Campus
3:30 pm	Arrive Energy Summit and join Page 1 Schedule

Side Trip #2: Visit to Dhanawas Village

For those people on the Teri Campus Tour:

3:30 pm	Depart Teri Campus
4:15 pm	Arrive Dhanawas Village

For those people at the Energy Summit:

3:00 pm	Depart Energy Summit
4:00 pm	Arrive Dhanawas Village: Meet up with Other Delegation Members
4:15 - 5:00 pm	Visit Dhanawas Village
5:10 pm	Depart enroute Hotel
6:00 pm	Arrive Hotel and join Page 1 Schedule

Wednesday, July 13, 1994

9:00 - 3:00 pm OPEN

3:30 - 5:00 pm Indo/U.S. Energy Partnership for the Future

Location: Maurya Hotel, room tbd

5:00 - 6:00 pm Press conference and announcements/signings

Location: Maurya Hotel, Bali Hi Room

Announcements and Agreements:

Bilateral agreements
Spectrum power purchase agreement
Biomass Cogeneration Memorandum of Understanding
Cannon

7:30 - 8:30 pm Reception hosted by Dr. Pachauri

Location: Teri Facility

Side Trip #1: Visit to National Thermal Power Corporation Research and Development Center

8:15 am Depart Hotel enroute National Thermal Power Corporation Research and Development Center

9:00 - 10:00am Visit to National Thermal Power Corporation Research and Development Center

Format: Tour followed by signings, announcements, dedication

Events: Inaugurate Power Plant Efficiency Center
Sign Clean Coal Protocol of Intent
Launch of IGCC Feasibility Study
Announce Indo/U.S. Coal Prep program

10:00 - 11:30 am Hold pending schedule changes

11:30 am Depart enroute meeting with Minister of Finance Singh

Location: North Block, #134, First Floor

11:30 - 12:15 pm Meeting with Minister of Finance Singh

Format: After photo opportunity and brief private discussion, the Secretary and Minister Singh will join members of the delegation for the remaining time

Wednesday, July 13, 1994 (Continued)

12:15 pm	Depart enroute Roundtable Luncheon
	Location: Oberoi Hotel
12:30 - 1:45 pm	Roundtable Luncheon hosted by Minister of Environment Nath
1:45 pm	Depart enroute Maurya Hotel
6:15 - 6:45 pm	Meet with Foreign Press
	Location: 16th floor lounge
6:45 - 7:30 pm	Hold for preparation

Thursday, July 14, 1994

6:30 am	Luggage Call
8:00 am	Depart Hotel enroute Airport
8:30 am	Depart New Delhi enroute Bombay
10:30 am	Arrive Bombay
	Met By: Consul General Mast
10:40 am	Depart Airport enroute Taj Intercontinental Hotel
11:45 am	Arrive Taj Intercontinental Hotel
11:45 - 2:00 pm	OPEN
2:00 - 5:00 pm	Financing Mobilization Roundtable
	Location: Taj Intercontinental Hotel
	Format: Moderated by Mr. Rajgopal
6:00 - 7:00 pm	Signing events and Announcements
	Location: Taj Intercontinental Hotel
	Agreements and Announcements: Siemens Solar Martin Marrietta -- Emgee Solar MOU SRC International Announcement
8:30 - 10:30 pm	Dinner hosted by Maharasha State Chief Minister Pawar
	Location: Taj Intercontinental Hotel

Friday, July 15, 1994

5:15 am	Luggage Call
7:00 am	Depart Taj Intercontinental Hotel enroute Bombay airport
7:45 am	Arrive Bombay Airport
8:30 am	Depart Bombay enroute Washington D.C.
11:30 am	Arrive Cairo Airport
3:30 pm	Depart Cairo Airport
7:10 pm	Arrive Shannon Airport
8:50 pm	Depart Shannon Airport
10:30 pm	Arrive Washington, D.C.

(b)(2)

DOE DELEGATION MEMBERS

Secretary O'Leary's India Trip--July 1994

Official Delegation

Hazel R. O'Leary — Head of Delegation
Secretary of Energy

Dan W. Reicher
Deputy Chief of Staff and Counselor

Jack S. Siegel
Acting Assistant Secretary
Fossil Energy

Terry Lash
Director
Office of Nuclear Energy

Frank M. Stewart Jr.
Deputy Assistant Secretary
Technical and Financial Assistance

Derrick L. Forrister
Special Assistant to the Secretary
for Policy

Denise Swink
Associate Deputy Assistant Secretary
Industrial Technologies

Robert H. Annan
Director
Office of Solar Energy Conversion

Johanna Dottori
Director
Office of Scheduling and Logistics

Robert S. Price Jr.
Director
Office of International Energy Relations

(b)(2)

Carolyn J. Wallace
Executive Secretary to Mrs. O'Leary

Policy/program support

Elizabeth A. Arner
Executive Assistant to the Secretary

Thomas R. Cutler
Office of International Energy Relations

Steven E. Fried
Trip Coordinator
Office of Scheduling and Logistics

Patricia Hicks (Secretary)
Office of Fossil Energy

David Mooney
International Programs Coordinator
National Renewable Energy Laboratory

William Peters
Program Coordinator
Advanced Power Generation and Fundamental Research Division
Pittsburgh Energy Technology Center

Dawn Schrepel
Executive Assistant to the
Assistant Secretary for Policy

Marian K. Thompson
Deputy Director
Office of Energy Exports

Laboratory Representatives

Bill W. Marshall
Associate Director for Research
National Renewable Energy Laboratory

Tom Wilbanks
Corporate Research Fellow and Manager
Developing Country Programs
Oak Ridge National Laboratory

Consultants

Ken Langer
Consultant to US-AEP

Bharat Mulchandani
Consultant to PETC

Chris Scherring
Consultant to NREL

C:\WDATA\DOEDEL.IND

USG (NON-DOE) DELEGATION
Secretary O'Leary's India Trip--July 1994

Agency for International Development
David Jhirad
Director, Energy Office

Commerce
William Cavitt
Special Assistant to the Deputy Assistant Secretary
for South Asia and the Pacific

Environmental Protection Agency
Janet McFarland
Senior Advisor, Office of Air and Radiation

Nuclear Regulatory Commission
Commissioner E. Gail de Planque
Carlton R. Stoiber, Director, International Programs.

National Security Council
Eileen Claussen, Special Assistant to the President and
Senior Director for Environmental Affairs

Overseas Private Investment Corp.
Harvey Himberg
Director, Investment Policy & Environmental Affairs

US-Asia Environmental Partnership (A.I.D.)
Lewis Reade, Director

C:\WDATA\USGDEL4.IND

TRIP REPORT

Presidential Mission on Sustainable Energy and Trade to China
Led by Secretary of Energy
Hazel R. O'Leary

February 15-24, 1995

MISSION OVERVIEW

Secretary of Energy Hazel R. O'Leary led a Presidential Mission on Sustainable Energy and Trade February 15-24, 1995, to Hong Kong, Shanghai, and Beijing. An official delegation of over 100 American business executives, environmental leaders and government officials accompanied Secretary O'Leary on the mission, the largest U.S. business delegation ever sent to China. The mission culminated in the signing of 34 business agreements totalling more than $6 billion ($4.6 billion of U.S. content) and seven bilateral government-to-government agreements designed to promote cooperation in the fields of energy and environment.

President Clinton defined the goals and objectives of the mission in a letter to the delegation, charging them to promote U.S.-China cooperation in energy, sustainable development and free trade. The President urged the delegates to "forge stronger bonds of friendship between the United States and China" and to pursue opportunities for "cooperative ventures that produce economic and environmental benefit to both our countries."

The Secretary conducted the mission at the invitation of Chinese State Planning Commission Chairman Chen Jinhua. The Chinese Government stated that it hoped to maintain and advance bilateral relations in the energy sector at a time when U.S.-China relations in other areas were strained.

Secretary O'Leary brought together a diverse team representing a broad spectrum of large and small energy companies, financial institutions, women- and minority-owned businesses, environmental groups and government specialists. Energy Department leaders organized the delegation into seven energy-sector subgroups, each of which had an appropriate mix of technical, commercial, regulatory and financial expertise suitable to address specific areas of China's energy sector. These seven "pods" covered the mission's focus areas: finance, environment, clean coal, oil and gas, renewable energy, electric power, and energy efficiency.

The mission highlighted our two countries' shared belief that sustainable energy development is critical to economic progress. The mission also focused on policies required to attract foreign investment to the China's energy sector, which China recognizes are necessary in order to make real progress in satisfying the country's rapidly growing demand for energy. The U.S. delegation encouraged the efforts of the Chinese government to structure an attractive investment climate, noting the positive steps that China has already made in this endeavor. The team also urged China to pursue sustainable energy and economic

development consistent with global environmental values.

The Secretary's mission began in Hong Kong, where she held a roundtable with key U.S. energy developers to discuss the challenges and opportunities in securing financing for energy projects in China. A major theme of the discussion was the absence of a clear Chinese policy on the involvement of foreign investors in power development, with the following key points highlighted:

- U.S. leaders should recognize and acknowledge China's immense accomplishments.
- Relationships are crucial to doing business in China.
- More exchanges with Chinese working level officials would benefit U.S. companies. Agreements must be signed, but relationships must also be developed with lower-level personnel in China and the U.S.
- A Chinese joint venture partner to guide the project through the complicated approval process should be carefully selected.
- Environmental laws must be fully enforced on a nondiscriminatory basis in order for U.S. power plant technologies to be competitive in China.

At the roundtable, Secretary O'Leary suggested the establishment of a framework for bilateral discussions with the Chinese and committed to emphasize during the mission the need for a clear project approval process, a legal structure for contract enforcement, foreign exchange, repatriation of profits, and an articulated set of principles and resultant policies to encourage energy development and efficiency.

The Secretary then traveled to Shanghai, where she was joined by the mission delegation and by the U.S. Amassador to China, Stapleton Roy, who honored the mission by traveling to Shanghai greet the Secretary and to initiate the delegation into China's political profile, economic trends and business culture. The Ambassador briefed the delegation on two Western schools of thought influencing investment decisions by private companies analyzing the Chinese market. One school believes that China's enormous economic expansion will continue, providing unparallelled opportunity in the largest market in the world. A second school focuses on the uncertain political situation in China, predicting a collapse in political stability that will rollback any economic advances and destabilize the rest of Asia. Ambassador Roy's advice was not to settle on one philosophy, but to following the reality of both schools in making investment decisions in China.

The delegation participated in a roundtable in Shanghai on financing regional energy projects. Chinese officials from the Shanghai Municipal Planning Commission and from the

neighboring provinces of Anhui, Jiangsu, and Zhejiang presented investment opportunities and policies specific to their province. Chinese presentations identified specific energy needs and project plans for their regions for the next decade. American presenters identified factors important for an attractive investment climate and steps that the U.S. and China could take to improve investment prospects for energy projects in China.

Participants at the roundtable identified two issues to work on jointly following the meeting:

- How to establish energy prices based upon market discipline to provide affordable energy without creating a complex regulatory system; and

- How to develop a system of joint advocacy for specific energy projects, whereby venture partners and provincial-level government officials would make joint recommendations to central government authorities.

In Beijing, the delegation members engaged Chinese counterparts from the central government in discussions on China's energy policies, focusing on investment barriers and opportunities and on the policy framework necessary to encourage foreign investment in the energy sector.

The centerpiece for these discussions was the "China-U.S. Summit on Energy for Sustainable Development and Cooperation," held in Beijing on February 22. Reports from the U.S. and Chinese co-chairs of each working group were presented at an "Action Plan Roundtable" held on February 23.

Policy discussions were also held at two, sector-specific events, an Oil and Gas Breakfast and a Sustainable Energy Lunch. The Oil and Gas Breakfast brought together for the first time the presidents of China's four oil, natural gas and petrochemical corporations, the Minister of Geology and Mineral Resources, a U.S. Cabinet official, and U.S. company representatives. Similarly, the Sustainable Energy Lunch provided an opportunity for Secretary O'Leary to discuss issues specific to renewable energy and energy efficiency with Chinese government officials from several key Chinese agencies, such as the State Science and Technology Commission, the State Economic and Trade Commission, the Meteorological Administration, the Ministry of Agriculture, the National Environmental Protection Agency, and the Academy of Sciences. Attendees agreed to cooperate in accelerating the development of renewable and efficiency technologies by enacting the working groups' initiatives. Furthermore, the State Science and Technology Commission agreed to provide the Department of Energy with information on organizations responsible for implementing those initiatives.

Secretary O'Leary and the delegation conducted a comprehensive series of bilateral meetings. The Secretary met with her official host, State Planning Commission Chairman Chen Jinhua, and with Premier Li Peng. She also held discussions with a number of counterparts in energy-related ministries and organizations: Vice Premier and Foreign Minister Qian Qichen; Vice Premier Zou Jiahua; State Science and Technology Commission Chairman Song Jian and Vice Minister Deng Nan; Minister of Power Industry Shi Dazhen; Minister of Foreign

Trade and Economic Cooperation Wu Yi; Minister of Coal Wang Senhao; and China National Nuclear Corporation President Jiang Xinxiong. In addition, the Secretary met with provincial-level officials, including soon-to-be-Mayor of Shanghai Xu Kuangdi. The willingness of the most senior Chinese leaders to meet with Secretary O'Leary highlighted the importance of the mission to the Chinese Government.

OVERVIEW OF ACCOMPLISHMENTS

The mission's success can be measured by progress in three main areas:

1) Frank and open policy dialogue engaged during the mission between the Secretary and mission delegates and senior Chinese leaders on concerns identified by U.S. firms trying to cooperate in China's energy sector. These concerns included clarification of the project approval process and project finance requirements, such as currency repatriation, foreign exchange, and the rate of return on investments. In addition, the mission addressed other broader issues such as nuclear nonproliferation and cooperation.

2) Establishment of a framework to continue pursuit of joint solutions and cooperation in a wide range of energy and environmental areas after the mission.

3) Progress on business development, highlighted at a February 20th signing ceremony in Shanghai and a February 24th ceremony in Beijing witnessed by Secretary O'Leary and SPC Vice Chairman Ye Qing.

Total private sector investment signed during the mission totalled over $6 billion, of which $4 billion resulted from 26 deals signed in Beijing and over $2 billion ($1 billion U.S. content) from 8 agreements signed in Shanghai. These agreements advanced approximately $630 million in renewable energy projects, $428 million in energy efficiency, $31.5 million in oil and gas projects, $1.4 billion in advanced coal projects, $2 billion in electric power generation, and $20 million in environmental technologies. These agreements will deliver clean, affordable energy to fuel China's economic growth, while promoting the use of U.S. skills, personnel, technology and investment funds and creating jobs in the U.S. and China.

In addition to witnessing the private sector signings, the Secretary signed six government-to-government agreements and witnessed the signing of a seventh. These agreements, which continue a 15-year effort by DOE to identify mutually advantageous areas of cooperation with China, include:

- Memorandum of Understanding to hold annual Bilateral Policy Consultations between DOE and the State Planning Commission at a senior level on a wide range of energy sector policies and technical programs. This agreement will serve as an umbrella for many of the policy activities identified during the

mission.

- Protocol on Energy Efficiency Improvement and Renewable Energy Technology Development and Utilization, which provides for cooperative activities with the State Science and Technology Commission in energy conservation, civil transportation (automotive) technology, and solar, wind, and geothermal energy.

- Annex on Cooperation in Coalbed Methane Recovery and Utilization with the Ministry of Coal Industry, which will help China to reduce greenhouse gas emissions.

- Letter of Intent for a Renewable Energy Annex to the Renewable Energy Protocol, which will promote cooperation with the Ministry of Agriculture on renewable energy in rural areas.

- Annex on Regional Climate Research to establish with the China Meteorological Administration a program of joint research to document, predict, and identify impacts of regional climate change.

- Statement of Intent on Reduced Enrichment for Research/Test Reactors (RERTR) to work together through the exchange of information on the conversion of Chinese research reactors from highly enriched to low enriched uranium.

- Statement of Intent on Energy Statistics and Market Information Exchange between China's State Statistical Bureau and the DOE Energy Information Administration (EIA).

To show appreciation of China's long history and distinguished culture, the Secretary and the delegation spent a few hours traveling to the Great Wall of China during the first full day in Beijing. This site gave the entire delegation a clearer understanding of the impact of China's history on current perspectives in China.

In an effort to enhance understanding of rural life in China, some delegates from the renewable energy, energy efficiency, and environment pods traveled to two rural villages, Yanqing and Mashuko. In each village, the delegation was shown traditional methods of heating, cooking, lighting, and other similar basic needs. In Yanqing, homes are heated with wood, corn stalks are used for cooking, and lighting is provided in part by small wind machines. In Mashuko, coal-fired boilers heat the homes, propane gas is used for cooking, electricity is grid-connected.

The "China-U.S. Summit on Energy for Sustainable Development and Cooperation" served as the centerpiece of the visit and allowed for in-depth discussions between energy and finance experts from both countries on ways to encourage sustainable energy investment in China. Tasked by Secretary O'Leary and SPC Vice Chairman Ye Qing at the opening plenary session, summit participants broke into working groups to discuss opportunities, concerns, and recommendations for action. In several sectors, these discussions led to further meetings during the remainder of the mission. The groups' recommendations--summarized later in this report--were presented to DOE Assistant Secretary Susan Tierney and Cao Zhengyuan, Director of the Transportation and Energy Department at the State Planning Commission, at an Action Plan Roundtable held the following day.

POD REPORTS

Each pod made specific findings and suggested follow-up actions on how to improve the climate for U.S.-China cooperation in its area. The pods' activities and these follow-up actions are summarized below.

RENEWABLE ENERGY

Opportunities for Cooperation

China has an abundance of renewable energy potential in biomass, hydro, solar, wind, geothermal, and ocean tidal resources and is already one of the world's largest users of renewables, primarily in biomass and hydroelectric power. There is a significant and growing interest in China in deploying additional renewable energy technologies to help meet energy demands and mitigate environmental problems.

The central government in Beijing, through various commissions and ministries, has active programs for developing renewable energy in all of these areas. China has established a goal of over 1,200 MWs of installed generating capacity using renewable sources by the year 2000. In addition, there are over 30 million rural households and 300 remote islands without access to a sustainable energy future.

China seeks assistance in the development of sustainable markets for renewables in China, increasing the experience base with renewables, and laying the foundation for deploying renewables to make a significant contribution to reducing emission and energy supply needs to China. Additionally, China seeks an infusion of U.S. technology and expertise to help improve the quality, reliability, and cost-effectiveness of the renewable energy technology base in China.

Because energy investments have lifetimes of over 40 years, energy choices made now will have impacts for decades. While China's energy strategy begins to address the needs of individuals, communities, and manufacturers to help them gain access to the modern world, it faces a challenge of achieving a long-term path toward a truly sustainable energy future.

Critical to the strategy is identification of and consultation with stakeholders in business and government. The Department's mission was an important step in that regard.

Concerns

- Renewable energy responsibility in China is spread among a number of competing organizations with designated, sometimes overlapping, responsibilities.

- There is currently a lack of trained personnel, experienced management, and quality equipment or components in the China's renewable industry.

- Cutting-edge renewable technologies are sometimes viewed by the Chinese as unproven and overly risky for use in China.

Accomplishments

The Mission advanced three objectives during the week of discussions.

- High level U.S. Government advocacy to encourage China to incorporate renewables into strategic planning and funding actions of its government.

- The development of direct linkages between U.S. and Chinese companies to promote business interactions.

- Initial progress in the development of markets for U.S. renewable industry that would help justify expanding production and achieving cost reduction.

Specific accomplishments include:

- The Department and Chinese Minister of Agriculture inaugurated potential cooperation in renewable energy for rural areas by visiting the Yanguing village and identifying top priority needs.

- The Department and China's Ministers of Electric Power and State Economic and Trade Commission agreed to develop annexes for cooperation to accelerate renewables for grid application and to promote commercial joint venture renewable energy projects.

- The Department, the U.S. Export Import Bank and the China State Banks agreed to work together in facilitating the financing of renewable energy projects above the $30 million State Planning Commission approval threshold.

- The Department and the Rockefeller Brothers Fund agreed to collaborate in advancing sustainable development objectives.

- At the Shanghai roundtable, the U.S. renewable energy delegates heard first hand of the energy investment opportunities in Shanghai, Zhejiang, Anhui and Jiangsu provinces. There was also clarification of the process for obtaining state approvals and subsequent financing.

Commitments and Recommendations

- To promote the goals of the Sustainable Development Summit, the following priority projects were identified for cooperation:
  - Catalogue and map the Chinese renewable energy resource base.
  - Assess U.S. manufacturing technology transfer options.
  - Investigate innovative financing options for renewable energy projects with special focus on rural energy systems.

Specific actions include:

- Finalize Annex with Minister of Agriculture and complete project scoping --May 1995.
- Together with energy efficiency and environmental groups, meet with U. S. World Bank Executive Director and develop strategy for working with World Bank and other multilateral financing institutions to promote sustainable development with stronger policy and financial interventions.--May 1995.
- Promote U. S. wind technology and experience at the International Conference on Wind Energy, May 9-13 in Beijing, China--May 1995.
- Jointly with Chinese, develop project plan for mapping China's renewable energy resources--May 1995.
- Jointly with Chinese and U.S. Export Import Bank, develop strategies for facilitating State Bank approvals and financing of U.S. renewable energy project investments--May 1995.
- Review with State Science and Technology Commission proposed projects for collaboration and initiate Protocol actions--June 1995.
- Finalize Annex of Cooperation for promoting joint ventures with State Economic and Trade Commission--June 1995.
- Finalize Annex of Cooperation for facilitating grid based renewable energy systems with Minister for Electric Power-- June 1995.
- With the Rockefeller Brothers Fund, develop projects that can be approved by their Board at an October 1995 meeting in Beijing-- June 1995.

- Jointly with Chinese, develop a seminar and tour of U.S. technology firms and manufacturing plants--July 1995.

- Expand Gansu project for private sector development of small scale solar home lighting systems--July 1995.

RENEWABLES: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
State Science & Technology Commission's Department of Industrial Technology - Shi Dinghuan	AMOCO/ENRON - Robert Kelly/Garry Mihaichuk	Letter of Intent to conduct a feasibility study for a 10 MW thin film photovoltaic manufacturing facility and a 150 MW solar electric generating facility	$290M
Inner Mongolian Provincial Electricity Board - Zhao Fengshan	FloWind Corporation - Harold Koegler	Agreement for Joint Venture for a 100 MW Wind Power Plant	$85M
Zhejiang Wind Energy - Zhang Bao Kang	FloWind Corporation - Harold Koegler	Letter of Intent to form a joint venture for a 30 MW Wind Power Plant	$29.5M
Inner Mongolian Electric Power Company - Zhao Feng Shan	ZOND Systems - Ken Karas	Letter of Intent to build one wind power plant	$110M
Guangdong Nanao Zhen Neng Wind Power Development Company - Zhang Zhen Gui	ZOND Systems - Ken Karas	Letter of Intent for the sale of 54 unit wind turbine generators for the Nanao Island Wind Power Project	$21M
Zhejiang Wind Power Development Company - Zhang Bao Kang	ZOND Systems - Ken Karas	Letter of Intent for the sale of 128 unit wind turbine generators for the Dachen Island Wind Power Project	$51M
China Chang Jiang Energy Corporation - Yu Zhian	New World Power - John Kuhns	Share Purchase Agreement with China Chang Jiang Energy Corporation to install a 39 MW wind farm for the Fujian Wind I project	$30M
China Chang Jiang Energy Corporation - Yu Zhian	New World Power - John Kuhns	Sustainable Development Agreement to annually conduct a series of official visits between Chinese and American officials to exchange information on renewable resources and technology	N/A
Beijing General Research Institute for Non-ferrous Metals, China Photovoltaic Electric Company - Lin Anzhong/ Mr. Chong	Spire Corporation - Roger Little	Memorandum of Understanding to construct a Polycrystalline Silicon PV production plant to be located in Hebei Province	$7-12M

RENEWABLES: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
Yunnan Semiconductor Device Factory - Zhang Weimin	Spire Corporation - Roger Little	Memorandum of Understanding to expand an existing photovoltaic manufacturing plant located in Yunnan Province	$1.5-2M

ENERGY EFFICIENCY

Opportunities for Cooperation

China plans to add 100,000 MW of new electric power over the next five years. Implementation of energy efficiency measures and technologies could cost-effectively increase that new capacity by 50 percent. The Chinese have made significant progress in implementing energy efficiency technologies and measures. Energy demand now increases only at approximately half the rate of economic expansion. However, increased power generation has received considerably greater attention than energy efficiency.

Joint efforts in areas such as district heating, cogeneration, energy-efficient buildings, motor systems, industrial processes, lighting, and amorphous core transformers could have a large impact in promoting energy efficiency in China. The present value of U.S.-China partnerships in energy efficiency is estimated to be about $50 million. However, China suggests that, with increased government/private sector cooperation, investment in energy efficiency could increase to $2-3 billion in the next three to five years. This represents a remarkable opportunity for U.S. companies.

Concerns

- The amount of available capital and variety of investment tools for development of energy supply are greater than that for energy efficiency.
- Lack of incentives and insufficient knowledge of end-user benefits limit the installation of energy efficient technologies.
- Existing energy efficiency codes and standards are not universally implemented.
- Policy changes are needed to encourage efficiency in the areas of financing for energy efficiency, integrated resource planning/demand side management, equipment efficiency standards, and energy market reforms.
- Many U.S. investors believe that the rates of return on investments in China are not adequate to compensate for market uncertainties, non-commercial problems, and intellectual property concerns.

Accomplishments

- At the Summit in Beijing, the efficiency working group discussed and generally agreed to a preliminary action plan for the establishment of U.S.-China business partnerships for energy efficiency technologies and measures, policy development, information exchange, communication, and education. The group set March 15, 1995 as the

deadline for determining the composition of the partnership teams. The working group agreed that a first draft of the action plan would be formulated by May 1, 1995. One proviso, introduced by the Chinese, was that more details be developed on specific projects.

Commitments and Recommendations

- Form partnerships to foster energy efficiency. These partnerships, involving Chinese government entities and U.S. public and private sector organizations, would promote energy efficiency by conducting joint projects in areas such as district heating, energy-efficient buildings, motor systems, industrial processes, lighting, and amorphous core transformers. The partnerships would also work to address concerns in energy efficiency through policy development and increased information exchange on the benefits and appropriate use of energy efficiency technologies and practices.

- Establish joint U.S.-Chinese energy efficiency activities and develop final Action Plan to implement the initiatives agreed to in the Energy Efficiency Working Group. -- by May 15, 1995.

- Work closely with the State Science and Technology Commission (SSTC) to coordinate development activities under the Protocol on Renewable Energy and Energy Efficiency.-- ongoing.

- Work with appropriate Chinese organizations to verify progress and status of projects and to advocate programs.-- ongoing.

ENERGY EFFICIENCY: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
Great Asia Industrial Development Company, Shanghai General Building Materials Group Corporation - Chung King Yan/Zhu Ge Tei Zhi	Owens-Corning - Ben Yau	Memorandum of Intent to build an insulation plant in Shanghai	$25M (plant) $30M/year (sales)
Yueyang General Petrochemical Works - Du Zu Gao	Honeywell - Mannie Jackson	Letter of Intent for the Yuehua SBS & BUT Distributed Control System Upgrade Project	$400M
Yangzi Petrochemical Company - Tang Min	Honeywell - Mannie Jackson	Commercial Sales Agreement	$3.8M

C

FINANCE

Opportunities for Cooperation

China's huge needs for energy require significant capital. China has recognized this in officially adopting a position of seeking foreign investment in China's energy sector. The Chinese government is encouraging foreign capital and joint ventures to help finance $200-$300 billion in investments through the year 2000. The greatest needs are in the electric power sector, where China hopes to add 15-23 GW of generation capacity annually for the next five years.

On the other hand, China has not secured significant foreign investment due to concerns about over-exposure to foreign debt and foreign control of key industries such as energy. China is reluctant to adopt legal, regulatory and financial mechanisms needed to attract foreign investment. Further, continued Chinese requests for "innovative financing approaches" suggest that, despite a need for foreign capital that far exceeds the resources of the multilateral lending institutions and the export credit agencies, China hopes to receive subsidized financing. This comes at a time when financial conditions in China, in other emerging markets, and in the United States would indicate that China would be hard pressed to compete for the requisite capital on a commercial basis.

The Presidential Mission provided the financial community with a unique opportunity to raise these concerns with a variety of officials at senior levels of the Chinese government, Chinese state companies, and Chinese state banks.

Concerns

- Lack of foreign exchange availability, currency convertibility, and repatriation of profits.

  Although China took an important step in 1994 by eliminating the dual exchange rate system, the Chinese currency, the renminbi, will not be a fully convertible currency for some time and foreign investors have very real concerns regarding access to foreign exchange over the life cycle of major projects.

- Effective existence of a cap on private power projects' rate of return.

- Unclear project approval process within the central government and between the provincial and central governments.

- Unclear regulatory framework.

Clarification is needed to provide a more complete understanding of China's long-term regulatory framework for decision-making on financial issues. Long-term projects such as energy infrastructure require clear, long-term and enforceable contracts for fuel supply and power purchase terms as well as tax treatment.

- Lack of a strong commercial legal system and effective and enforceable international, third-party arbitration to deal will disputes that might arise during the life of a project.

- Limits on foreign management.

  Limits on foreign management increase project risk because foreign investors have insufficient management control. This is exacerbated by laws and regulations that prohibit pledging assets of projects as collateral for loans.

Accomplishments

- The framework for cooperation on policy established in the Memorandum of Understanding between the US Department of Energy and China's State Planning Commission creates a forum to advocate policy changes that would facilitate U.S. financing of energy projects in China, as well as a forum to push for more rapid decision-making by the State Planning Commission on project proposals and for further empowerment of Chinese institutions to carry out effective monetary and fiscal policy.

- During the financial pod's meeting with the State Development Bank (SDB) of China, the delegation learned that:

  - The SDB was expecting in February to receive a credit rating from Moody's;

  - Because the biggest market in China is conventional power equipment and the second largest is nuclear, the SDB perceives a misplaced focus by U.S. manufacturers on telecommunications rather than on the largest markets; and,

  - SDB believes that electricity should pay back investment but not generate windfall profits.

- The financial pod also learned the following from the Bank of China:

  - China encourages the U.S. financial community (including developers) to present model "build, operate and transfer" (BOT) agreements, as well as examples of previous successful BOT projects in other countries to the State Planning Commission;

- The State Planning Commission imposed borrowing quotas because China's $90 billion debt is quite large, and they are trying to limit the rate of growth of debt exposure; and,

- More than 80% of joint ventures receive some Bank of China funds or services, but, as a result of a January 1, 1995, policy change, the Bank of China can provide loan guarantees only for the Chinese portion of a joint venture. Priority lending sectors in China are energy, telecommunications, transport and raw materials.

- During the course of the Mission, the Export-Import Bank of the United States made clear its willingness to work with U.S. firms on limited recourse financing of energy projects in China and its determination, within the context of the OECD and other guidelines, to competitively match financing offered by foreign export credit agencies.

- At Secretary's meeting with Wu Yi, Minister of Foreign Trade and Economic Cooperation, the delegation discussed MOFTEC's views on trade issues and the Minister's awareness of several power projects awaiting approval. During the meeting, Minister Wu cited Secretary O'Leary's mission as a symbol of "new vitality" in U.S.-China trade. Minister Wu noted her concern that the U.S. and China reach agreement on intellectual property rights so that trade friction would not affect the approval of power projects.

Commitments and Recommendations

- The business delegation urged the U.S. Government to reconsider the current restrictions that limit the ability of U.S. companies to successfully compete for energy development projects in China.

- The business delegation also proposed that the U.S. Departments of Commerce and Treasury coordinate more closely on financial issues such as currency convertibility and availability, and repatriation of profits.

- Establishment by the Department of an on-going dialogue with the U.S. financial community regarding how the Department can facilitate U.S. financing of U.S. energy projects in China (and other emerging markets).

- The Financial Roundtable in Shanghai led to agreement to establish two Sino-U.S. groups: one to explore regulatory reform, especially the use of cost of electricity provided in lieu of rate of return as a basis for judging project proposals; and one to serve as a joint US-Shanghai forum for project advocacy. The Secretary nominated Assistant Secretary for Policy Susan Tierney and General Counsel Robert Nordhaus, respectively, as leads for the two groups.

- The business delegation recommended that the following actions be taken by China in order to foster U.S. investment in China's energy sector:

  - Publish procedures for transparent, consistent and timely approvals of power projects, including the relationship between project approvals and inflation policies.

  - Facilitate the project approval process by the central government and between the central government and local (provincial and municipal) governments.

  - Move to market-based pricing for energy projects; assure that approval of pricing formula is for the life of the contract.

  - Improve the commercial legal system and ensure enforceable, international, third-party arbitration.

  - Eliminate problems with currency convertibility and availability, and repatriation of profits.

  - Enable foreign management control of foreign-invested projects.

  - Provide guidance to power bureaus on financial disclosure to power project lenders, and encourage development of credit-worthy entities to secure debt.

- The business delegation recommended that the following actions be taken by the U.S. Government and the private sector to foster U.S. participation in China's energy sector:

  - Encourage expanded U.S. Government support for power project financing, for example through U.S. Export-Import Bank financing.

  - Remove restrictions on Trade and Development Agency (TDA), the Overseas Private Investment Corporation (OPIC), and the U.S. Agency for International Development (AID) activities in China.

  - Provide the exchange of U.S. technical information and experience, for example on issues of pricing and the sharing of U.S. regulatory experience.

  - Facilitate communication between China and U.S. investment and commercial banks to provide information on and facilitate access to U.S. capital markets.

  - Utilize U.S.-China Summit's success to establish a continued dialogue between the U.S. private sector and the Chinese government for the purpose of developing a workable framework for the financing of energy projects.

ELECTRICITY

Opportunities for Cooperation

China is the world's third largest producer and consumer of energy. Rapid economic growth has increased the need for electric power generation and has worsened China's electricity shortage. The Chinese government estimates that electricity capacity needs will be 15 GW per year from 1994-1997, and 20 GW per year in 1998-2000. To meet this need, China plans to increase thermal generation, increase the efficiency of existing plants, speed up development of hydropower to keep it at 20% of electricity generation, develop nuclear generation including a domestic production market, enhance construction of high voltage transmission facilities and power distribution networks, open new renewable energy resources such as solar, wind, tidal, and geothermal to development, and further expand rural electrification.

Overall, reforms in China have tended to reduce the level of central government intervention in energy markets and laid the basis for broad-based price liberalization and operation of market forces. Major goals of the economic reforms are to grant greater independence to state-owned enterprises, reduce direct government assistance, and improve cooperation between central and local governments.

Concerns

- Rules and procedures for setting electricity prices are confusing to foreign investors. Rates are subject to renegotiation, and local authorities sometimes set arbitrary fees.

- Government reforms have helped expand available energy supplies and increase access to foreign capital. However, a lack of capital persists in the energy sector. Central planing systems dominate and contribute to uncertainties between central and regional authorities.

- A major concern in China and in other countries is the high level of emissions from China's booming economy, particularly from energy industries. Because coal is the primary source of energy and is expected to remain so for the foreseeable future, continued growth in CO_2 emissions and other pollutants is expected. Emission standards for new plants are much more stringent than for older plants and are expected to become still more stringent over the next few years. Nevertheless, emissions from power plants are still expected to increase due to rapid expansion of generating facilities and uncertainty of future environmental reforms.

- Projects involving foreign companies may not receive central government attention if they are not among the list of state priority infrastructure projects. In such instances, a letter of intent signed only by the local Chinese partner may have little meaning. U.S.

companies need to confirm that the central authorities are on board as they pursue project discussions with local officials.

- The energy sector has been subject to full-employment objectives, causing labor costs in energy production to reach exorbitant levels. Salary system reforms have helped resolve this problem by providing more autonomy to managers regarding employment decisions. However, some labor unrest has developed in the face of rising unemployment.

- Enterprises are hampered by the lack of clear cost-accounting procedures on which to base decisions. Standard accounting procedures are needed to provide a more consistent basis for managers and policymakers to make investment and operating decisions, and to allow potential investors to make more realistic assessments of the profit potential of individual investment opportunities.

- Hard currency repatriation is a key concern for foreign investors.

Accomplishments

The Mission resulted in the following mutually agreed actions to address China's electricity needs and provide opportunities for U.S. companies to participate in China's growing electricity market:

- The Ministry of Electric Power agreed to establish an informal "working group" consisting of Ministry staff, representatives of U.S. companies stationed in China, and U.S. Embassy personnel. This group will meet monthly to discuss issues relating to electricity projects in China.

- The Ministry of Electric Power clarified for the delegation the procedures used to evaluate electric power projects in China, particularly those with foreign partners.

- The State Planning Commission provided information on the way in which development of new electric power projects involving foreign participants fit in with overall macroeconomic plans for the Chinese economy, particularly with regard to efforts to control inflation and manage China's foreign debt and currency conversion obligations.

Commitments and Recommendations

- The Department will work with U.S. Embassy staff in Beijing to facilitate the initiation of an informal working group of U.S. firms and MEP staff in Beijing on electricity projects.

ELECTRICITY: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
Shanghai Municipal Electric Power Bureau	**WING Group** - Larry Haab	Project Development Proposal to replace coal-fired power plant with first large scale LPG power plant (650 MW)	$700M US Share $560M
China National Aero-Engine Corporation, Wuxi New Energy Investment Company - Zhou Xiao Qing/Ye Yong Fu	**Coastal Corporation** - David Arledge	Letter of Intent to establish the Wuxi City Peaking Project Phase I and Phase II project	$25M US share $15M
Zheqian Thermal Power Plant - Dai Jun Sheng	**Enserch Development Corporation, East Wind Power Partners** - Frank Maier/Joel Mize	Cooperative Joint Venture and Articles of Association to develop a 3X12 MW coal-fired plant	$27M US share $18.8M
Zheqian Thermal Power Plant - Dai Jun Sheng	**Enserch Development Corporation, East Wind Power Partners** - Frank Maier/Joel Mize	Letter of Intent to jointly develop a 100 MW combined-cycle power plant near Shaoxing City	$80-100M
Shanghai Jinqiao Heat Power Corporation - Liu Jia Qiang	**Community Energy Alternatives Inc.** - Colin Tam	Joint Venture Agreement to establish the Meiya Jinqiao Energy Company Ltd to provide a centralized steam, hot water and cooling system in the Jinqiao export Processing Zone in Pudong, Shanghai	$28M US share $16.8M
North China Power Group - Jiao Yi An	**ENTERGY** - Terry Ogletree	Long Term Cooperative Agreement	N/A
Sichuan Electric Power Authority - Ma Huai Xin	**InTeSol/Energy Initiatives** - Barclay Lew/Richard Guy	Letter of Intent to establish a joint venture to build a 2X600 MW coal-fired power plant	$1.2B US share $1B

ELECTRICITY: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
Jilin Province Energy & Transportation Company, Jilin Province Power Company - Zhang Yan/Guo Xue Chong	**InTeSol/Energy Initiatives** - Barclay Lew/Richard Guy	Letter of Intent to establish a joint venture to build a 2X300 MW coal-fired plant	$300M US share $150M
China Nuclear Energy Industry Corporation - Liu Xue Hong	**Westinghouse Electric Corporation** - Nat Woodson	Sales Contract for components of two 600 MW turbine generator units	$24M
Shanghai Municipal Electric Power Corporation Company Ltd., Shenergy Company Ltd. - Yu Ping/Wu Jia Hua	**Cogen Technologies, AIG-Asian Infrastructure Fund** - Bob Sherman/Richard Sun	Memorandum of Understanding to expand the Wu Jing Project (2X600 MW) in Shanghai	$1.2B US share $150M
Beijing District Heating Company - Chen Ming	**Cogen Technologies** - Bob Sherman	Agreement on the Eastern Heating Plant	$65M US share 45.5M

ENVIRONMENT

Opportunities for Cooperation

Environmental issues, a relatively new area of cooperation in China, has been elevated in the past year due in large part to China's Agenda 21 Report, a comprehensive document outlining a national sustainable development strategy. Under its Agenda 21 plan, China is expected to increase investment in renewables, energy efficiency, and other clean energy technologies. The plan identifies 62 priority projects on which China would like to cooperate with foreign investors. The Chinese government pledged to provide 60 percent of the estimated $4 billion needed by the year 2000 to implement these projects. The goals of Agenda 21 are being incorporated in China's Ninth Five-Year Plan (1996-2000), and the government is rethinking its industrial policies to encourage greater concern for the environment, such as asking foreign automobile manufacturers to develop energy-saving vehicles.

China's market for pollution control technologies is small but growing. In 1993, multilateral banks approved $1 billion for environmental projects in China, and China's total spending on clean-up and prevention could reach $3-$5 billion annually in 1995. China projects a need to spend $33 billion for environmental protection by 2000 but may lack the financial strength to enforce environmental standards without outside funding.

Concerns

- If economic growth continues as expected, China will experience rapid increases in greenhouse gas emissions and pollutants which adversely affect the local environment, significantly raising the level of global atmospheric concentrations.

- According to the Energy Information Administration, China's carbon emissions, which currently contribute 11 percent of world emissions, will increase by 4 percent per year (compared to 2.6 percent for all other developing countries) through 2010, when China's emissions are projected to equal 15 percent of world emissions.

- As in other types of projects in China, pollution prevention projects face economic and legal constraints that add to the difficulty of closing deals.

Accomplishments

- The environment pod, for the most part, spread out among the various energy pods to ensure that environmental issues were integrated into all discussions. Two side meetings were held for the environment pod: one on joint implementation (JI), and one with representatives of China's National Environmental Protection Agency (NEPA) on a wide range of environmental issues.

G.

- The JI meeting clarified China's concerns with respect to joint implementation in a fairly neutral, academic setting. The Chinese representatives, only one of which was from the government, reiterated China's position that JI should apply to Annex I countries only, that developing countries have made no commitments under the Framework Convention on Climate Change, and that joint activities could be undertaken as long as they are not called "joint implementation." The Chinese also asserted that the definition of JI needs to be clarified, and that joint studies should be conducted to determine criteria, evaluation methodologies, and cost-benefit analyses. There was much discussion surrounding the incremental costs of doing JI projects ("additionality").

- The U.S. participants clarified that, under the U.S. Initiative on Joint Implementation, additionality does not require that projects be non-cost-effective, but that they catalyze additional investments, and that JI can help to overcome the non-market barriers to otherwise economic projects.

- At the meeting with officials from NEPA, delegates were briefed on the Agency's desire to improve research on environmental standards, including the monitoring and enforcement of standards, on China's new pollution levy system, and on China's plans to increase environmental standards on new powerplants and other energy systems. Leon Richartz of Flowind Corporation explained how stringent environmental regulations in the U.S. have spurred private sector innovation, even with low oil prices, which have forced Flowind's wind technology to become increasingly competitive with fossil fuels.

Commitments and Recommendations

The following are follow-up recommendations from the environment delegates. They should build on the follow-up actions recommended by the renewable energy and energy efficiency pods.

- The Department of Energy should, at every opportunity, reinforce China's work on sustainable development and the consideration of environmental issues (including regulations and enforcement) in China's increasing energy production.

- The Department of Energy and/or environmental non-governmental organizations should explore with the Chinese joint efforts to implement the priority projects identified in the Agenda 21 Plan. Some of these projects could be evaluated for their potential under the U.S. Initiative on Joint Implementation.

- Additional efforts should be made to demonstrate to the Chinese how renewable and energy efficiency technologies are cost-effective for China. Some suggestions include: holding focused workshops in China to share U.S. analytical tools, models and case studies to provide a better understanding on the role of renewables and energy

efficiency in the electricity mix (a similar forum was held in India last year with funding provided by World Resources Institute, the World Bank, and USAID); developing and disseminating materials on renewable and energy-efficiency technologies to the Chinese; and providing a forum where U.S. companies currently active in the Chinese market can share their experiences to foster U.S. technology penetration into the Chinese market.

- The U.S. Government should work with the World Bank to promote energy efficiency loans to China's Energy Conservation Investment Corporation, a Chinese Government corporation that invests in energy efficiency retrofits for China's industries, focusing on cogeneration and other energy efficiency improvements. Because of China's immense size and needs, this organization can handle the large size loans that the World Bank prefers to provide.

- A network of organizations and individuals already active in China on issues related to environment and sustainable development issues should be developed. By having a concentrated network, opportunities for cross-fertilization on projects that could be beneficial for China's environment could be identified and implemented. The Beijing Energy Efficiency Center might provide the coordination for this effort.

- Follow-up on discussions held with Xingua University to explore cooperative research. Particular emphasis should be placed on trade models and equilibrium analysis to provide a practical basis to understand different cost gradients and the distribution of rents. This will help to examine the economics of JI projects in China and other markets. Possible activities could include joint academic research and/or a demonstration project between a Chinese enterprise, a U.S. private sector partner, and the U.S. government to provide a vehicle to collect relevant JI data.

- An examination of how environmental concerns can be better integrated into lending practices to China should be conducted. Perhaps by using Ex-Im Bank funding and other sources of assistance, environmentally-friendly technologies could receive the financial assistance they need to enter developing markets, with the long-term goal of attracting greater levels of private capital into profitable sustainable development projects. By beginning the process now and recognizing that World Bank funding and concessionary financing by other governments are limited, the U.S. could help direct private capital markets to invest in environmentally beneficial projects in China and other countries facing severe environmental problems.

- DOE and EPA should coordinate their follow-up on discussions with NEPA and SINOPEC (China's downstream oil corporation) on reducing and phasing out lead in gasoline. EPA has invited a senior official of NEPA to an EPA conference on this issue in March 1995.

- DOE should cooperate with China to develop its infrastructure for natural gas, which provides a small percentage of China's energy needs. The expanded use of natural gas could help China to deal with many environmental problems that are exacerbated by the heavy use of low quality coal.

ENVIRONMENT: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
National Environmental Protection Agency - Liu Yi	**Energy Resources International** - Jack Siegel	Joint Statement of Intent on controlling emissions from energy facilities in China	N/A
China International Engineering Consulting Corporation - Zhang Wang	**CH2M Hill International** - Raymond Yep	Association Agreement to form a new entity (CIECC/CH2M Hill Environmental Associates) to carry out projects identified in China's Agenda 21 plan	$20M

H.

CLEAN COAL TECHNOLOGY

Opportunities for Cooperation

China is projected to have the largest growth rate for electric power in the world, also becoming the largest source of emissions. Low power plant efficiency and low quality coal in China present an excellent opportunity for clean coal technologies.

The Department should work with China to ensure the realization of benefits associated with a coal market based on quality versus absolute quantity. Coal cleaning not only yields economic benefits (reduced transportation and operating costs, increased availability, and reduced ash disposal), but also yields environmental benefits (sulfur-emission reductions, and saleable by-products instead of disposal).

Chinese officials stated that high voltage transmission lines are needed to deliver power from the planned power stations near the coal mines to other parts of the country to alleviate demands placed on rail systems for transporting coal. Clean coal technology offers options for fully integrated facilities at the mine-mouth and also alternative means of coal transport, such as a slurry pipeline.

Recent contracts indicate that southern provincial governments, such as in Guangdong and Shanghai, are beginning to require sulfur control systems on new power facilities, many of which also require particulate control.

Based on communication with the State Science and Technology Commission, China has initiated draft environmental regulations based on U.S. New Source Performance Standards. The need to use utilize resources more efficiently will create the market for Clean Coal Technology.

To conserve energy, China wants to encourage cogeneration of heat and electricity by establishing experimental projects in some residential areas to demonstrate the efficient district central heating systems.

Integrated Gasification Combined-Cycle and a Pressurized Fluid Bed Boiler demonstration projects are both identified as priority projects under the Agenda 21 Plan.

Concerns

- China has not implemented legislation requiring environmental controls on power facilities (other than particulate control) and has not demonstrated a willingness to recognize that the higher capital cost of many clean coal technologies can be removed through improved operating performance. Therefore, based on a life-cycle analysis, Clean Coal Technology is competitive.

I

- Primary markets for cleaned coal in China are just beginning to provide incentives for quality, such as payment by the ton, not by the million Btus.

Accomplishments

- During meetings with the Ministers of Coal Industry and Electric Power, the Secretary committed continued DOE technical support to China for the development of an IGCC demonstration project in China using U.S. technology. DOE recently completed five tasks in support of the Chinese pre-feasibility study completed in December 1994.

- China is experiencing serious loses of coal resources from the spontaneous combustion of the more reactive coals. The Secretary committed to the Minister of Coal that DOE will participate with the United Nations in the development of a technical seminar in China during 1995 to address state-of-the-art technical approaches to reducing coal fires.

- The Clean Coal Technology Working Group at the Summit in Beijing identified areas for future bilateral activities. Along these lines, DOE will explore the development of new annexes to the Fossil Energy Protocol with the Ministry of Coal. Areas of future discussion were also identified with the Ministry of Chemical Industry regarding technology for converting coal to chemicals. This has been a very promising area for U.S. technology, with over twenty five projects in operation using U.S. technology to produce chemicals from coal in China.

Commitments and Recommendations

- The Department will continue to provide technical support to the Chinese for the development of an IGCC demonstration project in China using U.S. technology. The Chinese will identify new activities to support the IGCC feasibility study to be conducted during 1995. These activities will be reviewed with DOE in April 1995.

- In order to facilitate the development of a price structure which recognizes the favorable economic life-cycle cost of clean coal technology, the Department should explore joint cooperation towards the development of an independent regulatory structure in China compatible with a competitive electricity industry.

- The Department will began planning for activities under the new Coal Bed Methane Recovery and Utilization Annex signed in Beijing during the mission.

- DOE's Office of Fossil Energy will work with the United Nations and Ministry of Coal to organize a spontaneous coal combustion technical seminar. Planning for the seminar has already begun.

- The current Annex with the Ministry of Coal for coal mine safety has expired and the Ministry would prefer to continue these activities with the U.S. Although DOE is not the responsible organization for coal mine safety, DOE did commit to Minister Wang to pursue the matter with the U.S. Department of Labor and the U.S. Interior Department concerning a new annex for coal mine safety.

- The Department will pursue areas of cooperation with China's Ministry of Chemical Industry on U.S. technology for converting coal to chemicals.

- The Department will discuss with the Ministry of Coal an annex for research and development activities for clean coal technology in addition to the annex with the State Science and Technology Commission for the exchange of information in support of clean coal technology.

- China is conducting research and development activities in many of the same areas as the U.S. and is conducting feasibility studies for application of many of these technologies in China. The Department could exchange information, experience and personnel with China regarding the development and deployment of clean coal technologies and the cost of these technologies in China.

- During coal pod meetings with Chinese officials, it became evident that the Chinese did not view U.S. flue gas desulfurization technology to be as proven as German and Japanese technology. U.S. DOE representatives committed to bring a trade mission to China to try to change that opinion. DOE's Office of Export Promotion plans to conduct a trade mission to China in May 1995 that will address environmental control systems for power generation.

- U.S. industry representatives committed to providing the Ministry of Electric Power with a feasibility study for super critical boilers in China. Some U.S. firms also want to pursue discussions with the Ministry of Coal Industry regarding the purchase of carbon black. Additionally, many industry delegates identified a strong interest in pursuing activities with the Ministry of Chemical Industry to produce organic chemicals from coal.

COAL: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
Lu Mao Jiang Coal Mine Company, Hunan State Government - Li Jianzin	**EFH Coal** - Robert Eggleston	Memorandum of Understanding on a 50 MW coal-fired co-generation project	$50M
Shanghai Coking & Chemical Plant - Qui Guang Pei	**Institute of Gas Technology** - Bernard Lee	Memorandum of Understanding to install a gas turbine to produce 70 MW of power using clean gas from previously installed gasifiers	$70M US share $$35-46M
Huamei Coal Mixture Technology Center - Hao Feng Yin	**Ahlstrom Development Corporation** - Doug Wert	Memorandum of Understanding to build 2X125 MW power plants using Circulating Fluidized Bed combustion technology	$500M US share $100-200M
Guizhou Power Investment Company - Chen Shi	**Ahlstrom Development Corporation** - Doug Wert	Memorandum of Understanding to build 2X200 MW power plants using Circulating Fluidized Bed combustion technology	$280M
Ministry of Chemical Industry, SINOPEC - Wang Xinfang/Wang Xin Ming	**Texaco Inc. Alternative Energy Group** - David Crikelair	Multi-Plant License Agreement for 9 Texaco gasifiers	$500M
Beijing MinMetals & China Nuclear Industry REM Company - Pan Xu Dong	**Carbon Fuels Corporation** - Lee Meyer	Memorandum of Understanding to establish a joint venture for the exclusive development of the Charfuel coal refining process in China	$300M

J.

OIL AND NATURAL GAS

Opportunities for Cooperation

China's rapid economic growth has increased demand for petroleum 80% over the last ten years forcing China to become a net importer of crude oil in 1993. China is expected to increase its reliance on imported oil for the foreseeable future. Although its production is increasing, China seeks to further bolster its domestic oil and gas supply capacity and reserve base by attracting U.S. (and other western) petroleum companies to invest in both onshore and offshore exploration and development projects.

China's natural gas use has increased but is still only 2% of total primary energy consumption. Although the western China basins are expected to yield large gas reserves, development is expected to be slow because these basins are remote from demand centers. Offshore exploration, LNG imports and coal bed methane are near term sources of natural gas supply attracting significant attention from foreign investors.

In developing its oil policy, China National Petroleum Corporation (CNPC) now stresses the use of foreign as well as domestic resources and capital and is targeting international exploration and production markets for investment. An average of $1.9 billion per year is spent on oil and gas exploration in China, nearly half of which is from foreign sources.

The Chinese government believes that meeting demand growth for oil and natural gas from domestic production will require foreign investment and technical expertise. However, China's experience in doing business with foreign investors in the oil and gas sector is relatively recent, approximately fifteen years in offshore areas and only three years for onshore areas. Information exchange in critical technical, business and policy areas is seen by both China and the U.S. industry as pivotal in meeting China's petroleum needs.

Concerns

- The physical distances between the more prospective western basins and eastern population centers requires significant pipeline investments and large gas discoveries to make natural gas a major energy contributor in China.

- The most prospective onshore acreage has not been opened to foreign exploration.

- Chinese regulations are designed to minimize the flight of hard currency, making it difficult for U.S. companies to recover investments.

- Chinese are selective buyers of technical solutions. They will try to buy materials, supplies, and technology from Chinese companies unless it is not available. Opportunities exist mainly for foreign companies offering new technologies that

K.

provide specific solutions to Chinese problems.

Accomplishments

- Five ministerial level organizations, including the Ministry of Geology and Mineral Resources (MGMR), China National Petroleum Corporation (CNPC), China National Offshore Oil Corporation (CNOOC), China Petro-Chemical Corporation (SINOPEC), and China National Chemicals Import-Export Corporation (SINOCHEM), met under the auspices of the State Planning Commission (SPC) with U.S. delegation members. The meeting resulted in the exchange of significant information and agreement to structure continued cooperative activities.

- Specific action items involving possible U.S. industry investments were presented by the Chinese related to the individual business sectors, including:

    - Information from CNPC on the timing and content of the third round of onshore leasing.

    - Plans for increasing natural gas supply (on- and offshore) and infrastructure for power generation and residential use.

    - Plans for aggressive expansion of China's refining and petrochemicals industries, including the potential for alternative financing such as offering shares in the public market.

Commitments and Recommendations

- The Department and the State Planning Commission will facilitate a forum for ongoing meetings among the four Chinese state oil and gas corporations (CNPC, CNOOC, SINOPEC, and SINOCHEM), the Ministry of Geology and Mineral Resources, and U.S. petroleum industry representatives in China to pursue joint cooperation in the following areas:

    - Foreign investment opportunities,
    - Facilitated coordination on approvals and licensing,
    - Geotechnical data coordination,
    - Advanced and enhanced oil recovery efforts,
    - Natural gas market structure and regulatory information, and
    - U.S. management practices and techniques.

- The Department will work with the industry delegates from the mission to develop plans for engaging a larger share of the U.S. oil and gas community in discussions and bilateral activities with China.

- The industry delegation and the Department will engage the U.S. Embassy in Beijing to establish regular meetings of in-country industry representatives and Chinese counterparts.

OIL AND GAS: PRIVATE SECTOR AGREEMENTS

CHINESE PARTNER	U.S. COMPANY	TYPE OF DOCUMENT SIGNED	$ VALUE
China National Offshore Oil Corporation - Wang Yan	**Chevron** - Richard Matzke	Offshore Oil & Gas Exploration, Development and Production sharing agreement for South China Sea Block 62/23	$30M
Liaohe Petroleum Exploration Bureau - Li Ming Yi	**Halliburton/ Brown & Root** - Dale Jones	Agreement to form a joint venture company to manufacture high technology flow measurement products	$850,000
Daqing Petroleum Administration Bureau - Li Xaio Fang	**Halliburton/ Brown & Root** - Dale Jones	Contract to establish a perforating charge API facility	$638,000

NUCLEAR POWER

Opportunities for Cooperation

Nuclear power represents a relatively minor but growing share of China's electric generating capacity, with two plants currently in operation producing a total of 2.1 GW, or less than 1 percent of electricity capacity. The Qinshan plant began operation in 1991 with a 288 MW unit in 1991, and the Daya Bay plant, China's first commercial nuclear plant, is operating with two, 906 MW units. In addition, China plans to have 10 GW of nuclear capacity operational or under construction by 2000, and 150 GW by 2050.

Current nuclear cooperation consists of an agreement between the U.S. Nuclear Regulatory Commission and the Chinese regulator to work on safety issues, and a "grandfathered" Department of Energy authorization for Westinghouse to work with China on advanced pressurized water reactors. Recent discussions within the U.S. Government have confirmed a general desire to explore the issue of expanded nuclear cooperation with China and to pursue opportunities for safe, reliable U.S. nuclear technology.

Concerns

- In order for the United States and China to fully cooperate in nuclear power, the 1985 U.S.-China Agreement for Nuclear Cooperation must be implemented. Implementation requires, among other things, that the President certify to Congress that China is not assisting and will not assist any non-weapon state to acquire nuclear weapons. (The President would also be required to report China's progress in political reform, including increased respect for human rights.) To date, the President has been unable to make that certification.

- The lack of a fully-implemented agreement precludes U.S. exports of reactors and other key nuclear island components to China (except for certain grandfathered proprietary technology which can be provided).

- If China accomplishes its ambitious nuclear program, it may outstrip the abilities of regulators to keep up, particularly if existing levels of training and staffing are not increased.

- China's use of a variety of reactor types complicates its regulatory situation and multiplies its training requirements.

- The United States believes that the window of opportunity to win contracts for the next group of plants to be constructed in China is only approximately 12 to 18 months.

Accomplishments

During the meeting with Jiang Xinxiong, President of the China National Nuclear Corporation, the Secretary clearly and forcefully expressed the U.S. interest in expanded nuclear cooperation with China, while emphasizing the necessity to satisfy the nonproliferation requirements of U.S. law in order to fully implement the 1985 U.S.-China Agreement for Nuclear Cooperation. Specific accomplishments include:

- Memorandum of Understanding signed between Westinghouse Electric and the China National Nuclear Corporation on potential future cooperation to develop the AP-600 advanced pressurized water reactor.

- Package of documents initialed by the Secretary and provided to the China National Nuclear Corporation which provides assurances to the Chinese that their cooperation with Westinghouse in conventional nuclear technology for the Qinshan plant is consistent with U.S. law.

- Memorandum of Understanding signed between ABB/Combustion Engineering and the China National Nuclear Corporation for a feasibility study for future nuclear cooperation.

- Statement of Intent on Reduced Enrichment for Research and Test Reactors signed by the Secretary and President Jiang Xinxiong.

Commitments and Recommendations

- Westinghouse Cooperation on AP600

  The China National Nuclear Corporation and Westinghouse have agreed to evaluate the prospects of building an AP600 advanced pressurized water reactor in China. Westinghouse holds an authorization under Department of Energy regulations to transfer to China the full range of pressurized water technology, which is a "grandfathered" exception to the 1990 Tiananmen Square sanctions. Because Westinghouse is developing the AP600 with Department of Energy financial support, the Department must give permission for a foreign country to participate in the program.

  Westinghouse has requested the Department's permission to:

  - Invite six engineers from the Chinese National Nuclear Corporation's Nuclear Power Institute to participate in AP600 activities near Pittsburgh (Monroeville).

- Allow the Nuclear Power Institute to perform evaluation tests of aspects of the AP600 design in China.

- By March 17 the Department must make a determination on allowing the six Chinese engineers to participate in the AP600 program. The Office of Nuclear Energy will notify Westinghouse of the determination.

- The Office of Nuclear Energy will work with Westinghouse to map out planned AP600-related activities in China for the next two years and to determine what Department of Energy actions will be required. It should be noted that to assist China in building an AP600, Westinghouse will have to get DOE consent. (The U.S. Government may require implementation of the Agreement for Cooperation prior to giving consent.) In addition, in order for China to build an AP600 with U.S. components, China would have to come into full compliance with the Nuclear Nonproliferation Act.

- Reduced Enrichment for Research and Test Reactors

DOE's Office of Nonproliferation and National Security will contact the China National Nuclear Corporation to set up a meeting of technical experts to negotiate a contract and scope of work for their cooperation on reduced enrichment for research and test reactors.

- Cesium-137 Capsules

In 1988, the Department of Energy signed a contract with the Beijing Institute of Nuclear Engineering to supply the Chinese with four cesium-137 capsules for use in a portable food irradiator. Since then, the Department has identified several concerns related to this project, including safety, liability, final disposition, and cost.

- By April 1, the Office of Nuclear Energy will make a determination on proceeding with the contract and will notify the China National Nuclear Corporation of its decision.

ATTACHMENTS

Itinerary

Delegation List

Presidential Mission on Sustainable Energy and Trade to China
Led by the Honorable Hazel R. O'Leary, Secretary of Energy

FINAL DELEGATION AGENDA

Sunday, February 19

12:00pm	Arrive Shanghai, met by Secretary O'Leary
5:00-5:30pm	Welcome Reception hosted by Secretary O'Leary
5:30-7:00pm	Reception Hosted by American Chamber of Commerce Shanghai

Monday, February 20

7:30-9:00am	Delegation Breakfast, briefing by Ambassador Roy
9:30am-12:00pm	Roundtable: "Financing China/U.S. Joint Projects in Energy -- The Role of Municipalities and Provinces in Future Cooperations"
12:15-12:45pm	Secretarial Meeting with Executive Vice Mayor Xu Kuangdi
12:45-2:30pm	Lunch Hosted by Vice Mayor Hua Jianmin
3:00-4:00pm	Private Sector Signing Ceremony
5:30pm	Depart enroute Beijing
7:00pm	Arrive Beijing

Tuesday, February 21

8:30am-1:30pm	Renewable Energy Village Visit
9:00-10:00am	Secretarial Meeting with Ye Qing, Vice Chairman, State Planning Commission
10:30-11:30am	Secretarial Meeting with Wang Senhao, Minister of Coal Industry
11:45am	Depart enroute Great Wall of China at Badaling
1:30-3:00pm	Tour of Great Wall of China
1:45-4:00pm	Coal Pod Meetings at State Science and Technology Commission
6:30-8:30pm	Welcome Dinner Hosted by the People's Republic of China

Wednesday, February 22

9:00-10:15am	China/U.S. Summit on Energy for Sustainable Development and Future Cooperation: Opening Plenary
10:30am-12:00pm	China/U.S. Summit on Energy for Sustainable Development and Future Cooperation: Financing Working Group
12:00-2:00pm	American Chamber of Commerce Luncheon
2:30-5:30pm	China/U.S. Summit on Energy for Sustainable Development and Future Cooperation: Working Groups: Clean Coal; Energy Efficiency; Electricity; Oil and Gas; Renewable Energy
3:00-4:00pm	Secretarial Meeting with Jiang Xinxiong, President, China National Nuclear Corporation
6:30-8:30pm	Renewable Energy Dinner

Thursday, February 23

8:00-9:30am	Oil and Gas Breakfast
10:30-11:30am	Meeting with Shi Dazhen, Minister of Electric Power
12:30-1:30pm	Clean Energy Luncheon
2:00-2:30pm	Media Interviews
3:00-4:00pm	Meeting with Qian Qichen, Vice Premier and Foreign Minister
4:30-5:30pm	Meeting with Li Peng, Premier
5:40-6:10pm	Secretarial Meeting with Song Jian, Chairman, State Science and Technology Commission
6:20-6:45pm	Bilateral Agreements signing ceremony

Friday, February 24

8:30-9:15am	Meeting with Wu Yi, Minister of Foreign Trade and Economic Cooperation
10:00-11:00am	Private Sector Signing Ceremony
11:15-11:45am	Press Conference
12:00-2:00pm	U.S./China Business Council Luncheon
2:15-3:30pm	Media Interviews
4:15-5:00pm	Meeting with Zou Jiahua, Vice Premier
11:59pm	Depart China enroute U.S.

Saturday, February 25

7:30am Arrive Dulles International Airport

Presidential Mission on Sustainable Energy and Trade to China
Led by the Honorable Hazel R. O'Leary, Secretary of Energy

FINAL SECRETARIAL AGENDA

Sunday, February 19

10:05am	Arrive Shanghai
12:00pm	Meet arriving Delegation
4:00-5:00pm	Media Roundtable
5:00-5:30pm	Welcome Reception hosted by Secretary O'Leary
5:30-7:00pm	Reception Hosted by American Chamber of Commerce Shanghai

Monday, February 20

7:30-9:00am	Delegation Breakfast
9:30am-12:00pm	Roundtable: "Financing China/U.S. Joint Projects in Energy -- The Role of Municipalities and Provinces in Future Cooperations"
12:15-12:45pm	Meeting with Executive Vice Mayor Xu Kuangdi
12:45-2:30pm	Lunch Hosted by Vice Mayor Hua Jianmin
3:00-4:00pm	Private Sector Signing Ceremony
5:30pm	Depart enroute Beijing
7:00pm	Arrive Beijing

Tuesday, February 21

8:30-8:45am	Meeting with Chen Jinhua, Chairman, State Planning Commission
8:45-10:00am	Meeting withYe Qing, Vice Chairman, State Planning Commission
10:30-11:30am	Meeting with Wang Senhao, Minister of Coal Industry
11:45am	Depart enroute Great Wall of China at Badaling
1:30-3:00pm	Tour of Great Wall of China

Wednesday, February 22

9:00-10:15am	China/U.S. Summit on Energy for Sustainable Development and Future Cooperation: Opening Plenary
12:00-2:00pm	American Chamber of Commerce Luncheon
3:00-4:00pm	Meeting with Jiang Xinxiong , President, China National Nuclear Corporation

Thursday, February 23

8:00-9:30am	Secretarial Oil and Gas Breakfast
8:30-10:00am	Off-line Meeting on Joint Implimentation
8:30-11:30am	Finance Pod Meetings with State Development Bank and Bank of China
8:30am-2:30pm	Coal Pod Meetings with Ministry of Coal Industry and Ministry of Electric Power
10:00-11:30am	Environment Pod Meeting with National Environmental Protection Agency
10:30-11:30am	Secretarial Meeting with Shi Dazhen, Minister of Electric Power
12:30-1:30pm	Secretarial Sustainable Energy Luncheon
2:00-3:00pm	Renewable Pod Meeting with Industrial and Commercialization Bank of China
2:45-3:45pm	A&E and Equipment Pod Meeting with Beijing Institute of Nuclear Engineering
3:00-4:00pm	Secreterial Meeting with Qian Qichen,Vice Premier and Foreign Minister
4:30-5:30pm	Secretarial Meeting with Li Peng, Premier
4:30-6:00pm	Action Plan Roundtable
5:40-6:10pm	Secretarial Meeting with Song Jian, Chairman, State Science and Technology Commission
6:20-6:45pm	Bilateral Agreements signing ceremony

Presidential Mission on Sustainable Energy and Trade to China
Official Delegation

Mr. Robert Donovan
President and CEO
ABB Inc.
501 Merritt 7
P.O. Box 5308
Norwalk, CT 06856-5308
ph: 203/750-2380
fax: 203/750-2383
A&E

Mr. Steve Nadel
Deputy Director
ACEEE
Visiting Researcher
Beijing Energy Efficiency Center
Zhansimen Shahe
Changping County, Beijing
ph: 86-1-973-2059
fax: 86-1-973-2059
energy efficiency

Mr. Vello Kuuskraa
President
Advanced Resources International, Inc.
1110 North Glebe Road, Suite 600
Arlington, VA 22201
ph: 703/528-8420
fax: 703/528-0439
coal

Mr. Roger W. Sant
Chairman
The AES Corporation
1001 North 19th Street, Suite 2000
Arlington, VA 22209
ph: 703/522-1315
fax: 703/276-6758
power generation

Mr. Doug Wert
Vice President, Strategic Business Development
Ahlstrom Development Corp.
8925 Recho Road
San Diego, CA 92121-3269
ph: 619/458-3000
fax: 619/457-0855
coal

Ms. Jessica Holliday
Vice President of Federal Relations and Washington Counsel
Air Products and Chemicals Inc.
805 15th Street, NW
Washington, DC 20005
ph: 202/289-4110
fax: 202/289-4084
coal

Mr. David Pendlebury
Vice President & General Manager, Amorphous Metals
Allied - Signal
6 Eastmans Road
Parsippany, NJ 07054
ph: 201/581-7500
fax: 201/581-7581
energy efficiency

Ms. Doreen Chiu
President and Chief Executive Officer
Allied Technology Group
47375 Fremont Blvd.
Fremont, CA 94538
ph: 510/490-3008
fax: 510/651-3731
oil and gas

Mr. Don Clements, Jr.
Vice President, Corporate Relations
AEP
1 Riverside Plaza
Columbus, OH 43215
ph: 614/223-1802
fax: 614/223-1822
power generation

Mr. John Jones
Vice President, Fossil and Hydro Generation
AEP
1 Riverside Plaza
Columbis, OH 43215
ph: 614/223-1801
fax: 614/223-1822
power generation

Mr. Bernard Hu
AEP
2648 Dursee Ave.
El Monte, CA 91732
ph: 818/443-3818

Mr. Garry Mihaichuk
Senior Vice President
Amoco Oil
200 East Randolph
Chicago, IL 60601
ph: 312/856-6111
fax: 312/856-2460
oil and gas

Ms. Cheryl Dobbins
President
Basic Technologies International
4641 Montgomery Avenue, Suite 300
Bethesda, MD 20814
ph: 301/907-0322
fax: 301/654-5231
environment

Mr. William U. Chandler
Director, Advanced International Studies Unit
Battelle, PNL
901 D Street, S.W., Suite 900
Washington, DC 20024-2115
ph: 202/646-5242
fax: 202/646-5233
government/energy efficiency

Mr. Armand Langmo
Vice President & Manager of A&E New Generation
Bechtel Group, Inc.
50 Beale Street, 7th Floor
San Francisco, CA 94105-1895
ph: 415/768-6625
fax: 415/768-4960
A&E

Mr. Thomas Kalin
Vice President
Black & Veatch
11401 Lamar
Overland Park, KS 66211
ph: 913/339-7867
fax: 913/339-2934
power

Ms. Dina Temple-Raston
Bloomberg Financial News
19F, Shanghai Television Broadcast Bldg.
651, Nanjing Rd. (W)
Shanghai 200041, China
ph: 86-21-267-9871
fax: 86-21-267-9874
press

Mr. Lee Meyer
President and CEO
Carbon Fuels Corporation
5105 DTC Parkway
Englewood, CO 80111
ph: 303/770-7667
fax: 303/770-7686
coal

Mr. Rigdon Boykin
Attorney
Chadbourne & Parke
Suite 3704 Peregrine Tower
Lippo Centre, 89 Queensway
Hong Hong
ph: 852/2842-5400
fax: 852/2521-7527
finance

Mr. Ross Deegan
Managing Director
Chevron China
Room 3012-14 Jing Guang Center
Hujialou, Chaoyang Qu
Beijing 100020, China
ph: 86-1-501-9611
fax: 86-1-501-5108
oil and gas

Mr. Richard Matzke
President
Chevron Overseas Petroleum, Inc.
6001 Bollinger Canyon Road
San Ramon, CA 94583-0946
ph: 510/842-1726
fax: 510/842-1485
oil and gas

Mr. Joe Casson
Director, Power Sector
Citibank - Hong Kong
Citibank Tower, 47th Floor
3 Garden Road
Central, Hong Kong
ph: 011-852-868-6690
fax: 011-852-526-1639
finance

Mr. David Arledge
President and Chief Operating Officer
Coastal Corporation
Nine Greenway Plaza
Houston, TX 77046
ph: 713/877-7043
fax: 713/877-7305
power generation

Mr. Robert Hart
President
Coastal Power Production Company
Nine Greenway Plaza
Houston, TX 77046
ph: 713/877-3763
fax: 713/297-1513
power generation

Mr. Robert Sherman
Vice President & General Counsel
Cogen Technologies
1600 Smith Street
Houston, TX 77002
ph: 713/951-7722
fax: 713/951-7760
power generation

Mr. Don Kendall
President
Cogen Technologies Capital Company
1600 Smith Street, 50th Floor
Houston, TX 77002
ph: 713/951-7711
fax: 713/951-7774
power generation

Mr. Michael J. Thompson
COO and Senior Vice President
Community Energy Alternatives
1200 East Ridgewood
Ridgewood, NJ 07450
ph: 201/612-5420
fax: 201/612-8450
power generation

Mr. Colin Tam
Senior Vice President
CEA Asia
Room 1710, Harbour Center
25 Harbour Road
Wanchai, Hong Kong
ph: 852/519-0022
power generation

Mr. Peter Higginbotham
Director
CS First Boston - Hong Kong
c/o Park Avenue Plaza
55 East 52nd Street
New York, NY 10055
ph: 212/909-2415
fax: 212/758-9584
finance

Mr. Robert Horton
President
Custom Coals Corporation
7223 Carefree Drive
Carefree, AZ 85377
ph: 602/488-3388
fax: 602/488-3881
coal

Mr. Omer Brown
Partner
Davis Wright Tremaine
1155 Connecticut Avenue, NW
Suite 700
Washington, DC 20036
ph: 202/508-6611
fax: 202/508-6699
finance

Ms. Cheryl McQueen
Senior International Affairs Officer
Department of Commerce
14th and Constitution, N.W., Room 3850
Washington, DC 20230
ph: 202/482-2867
fax: 202/482-4453
government

Mr. Robert Eggleston
President
EFH Coal Company
89 Miller Street
West North End Station
Wilkes-Barre, PA 18705
ph: 717/823-7664
fax: 717/829-4515
coal

Mr. Jack Siegel
President, Fossil Energy and Environment Group
Energy Resources International
1015 18th Street, NW
Suite 650
Washington, DC 20036
ph: 202/785-8833
fax: 202/785-8834
coal

Mr. Terry Thorn
Senior Vice President, Government Affairs
Enron Corp.
1400 Smith Street
Houston, TX 77023-7269
ph: 713/853-3071
fax: 713/646-4831
oil and gas

Mr. Frank A. Maier
Senior Vice President
ENSERCH Development Corporation
1817 Wood Street
Suite 50
Dallas, TX 75201
ph: 214/670-2568
fax: 214/670-2974
power generation

Mr. Terry Ogletree
CEO & President
Entergy Corporation
900 South Shackelford
Little Rock, AR 72211
ph: 501/954-5010
fax: 501/954-5003
power generation

Mr. Dan Dudek
Senior Economist
Environmental Defense Fund
257 Park Avenue South
New York, NY 10010
ph: 212/505-2100
fax: 212/505-2375
environment

The Honorable William Nitze
Assistant Administrator for International Activities
Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460
ph: 202/260-4870
fax: 202/260-9653
government

Mr. Craig O'Connor
Environmental Liaison Officer
Export-Import Bank of the United States
811 Vermont Avenue, N.W.
Washington, DC 20571
ph: 202/565-3540
fax: 202/565-3548
government

Ms. Julie Belaga
Member of the Board
Export-Import Bank of the United States
811 Vermont Avenue, N.W.
Washington, DC 20571
ph: 202/565-3540
fax: 202/565-3548
government

Mr. Leon Richartz
Chairman of the Board
Flowind Corporation
900 A Street, Suite 300
San Rafael, CA 94901
ph: 415/721-1300
fax: 415/721-1355
renewables

Mr. Robert Whittaker
Vice President, Group Executive
Foster Wheeler Corp.
Perryville Corporate Park
Clinton, NJ 08890-4000
ph: 908/730-5413
fax: 908/730-5300
coal

Mr. Linden Blue
Vice Chairman
General Atomics
3550 General Atomics Court
San Diego, CA 92121-1194
ph: 619/455-4300
fax: 619/455-2122
A&E

Mr. Gene Zeltman
Manager, Trade & Industry Associations
GE Power Systems
Building 2, Room 704A
1 River Road
Schenectady, NY 12345
ph: 518/385-2320
fax: 518/385-5704
power generation

Mr. Dale Jones
President
Halliburton
3600 Lincoln Plaza, 500 North Arkard
Dallas, TX 75201
ph: 214/978-2651
fax: 214/978-2800
oil and gas

Mr. Mannie Jackson
Senior Vice President for International Programs
Honeywell Inc.
P.O. Box 524
Minneapolis, MN 55440-0524
ph: 612/951-0125
fax: 612/951-3756
energy efficiency

Mr. Larry D. Haab
Chairman, CEO and President
Illinova
500 South 27th Street
Decatur, IL 62525
ph: 217/424-7152
fax: 217/362-7417
power generation

Dr. Bernard Lee
President
Institute of Gas Technology
1700 S. Mt. Prospect Rd.
Des Plaines, IL 60018
ph: 708-768-0504
fax: 708-768-0802
coal

Mr. Steve Roy
President
Intercontinental Energy Group
350 Lincoln Place
Hingham, MA 02043
ph: 617/749-9800
fax: 617/740-1281
power generation

Mr. Barclay Lew
President
InTeSol International
1027 18th Street
Santa Monica, CA 90403
ph: 310/729-5403
fax: 310/453-8318
power

Dr. Milton Russell
Director
Joint Institute for Energy and Environment
327 South Stadium Hall
Knoxville, TN 37996-0710
ph: 615/974-4251
fax: 615/974-1838
environment

Mr. Harrison Wellford
Partner
Latham & Watkins
1001 Pennsylvania Avenue, N.W.
Suite 1300
Washington, DC 20004-2505
ph: 202/637-2200
fax: 202/637-2201
finance

Dr. Mark Levine
The Energy Analysis/Program-Head
Lawrence Berkeley Laboratory
Building 90, Room 4000
Berkeley, CA 94720
ph: 510/486-5238
fax: 510/486-6996
government

Ms. Linda Marvin
President
Lockheed Environmental Systems and Technologies Company
Citicorp Center
1200 Smith Street, Suite 800
Houston, TX 77002-4309
ph: 713/654-2772
fax: 713/654-4850
coal

Mr. Michael C. Forrest
Senior Vice President, Business Development
Maxus Energy Corporation
717 North Harwood Street
Dallas, TX 75201
ph: 214/953-2799
fax: 214/979-8111
oil and gas

Mr. Charles A. Trabandt
Chairman, Global Power Strategic Advisory Committee
Merrill Lynch & Company
250 Vesey Street, 27th Floor
New York, NY 10281
ph: 212/449-9793
fax: 212/449-8636
finance

Mr. Theodore Liu
Executive Director
Morgan Stanley Asia Limited
30th Floor, Three Exchange Square
Hong Kong
ph: 852-848-5576
fax: 852-537-1909
finance

Mr. Dan Lashof
Senior Scientist
Natural Resources Defense Council
1350 New York Ave., N.W.
Washington, DC 20005
ph: 202/624-9364
fax: 202/783-5917
environment

Mr. John Kuhns
CEO
New World Power
The Farmhouse
558 Lime Rock Rd.
Lime Rock, CT 06039
ph: 203/435-4000
fax: 203/435-0505
renewables

Mr. Micheal Cooper
Director of Development-Asia
Cooper & Company
4999 Kahala Ave.
Honoloulou, HI 96816
ph: 808/732-8144
fx: 808/732-4099
renewables

Ms. Julie Jorgenson
Vice President and General Counsel
NRG Energy Inc.
1221 Nicollet Mall
Minneapolis, MN 55403
ph: 612/373-5303
fax: 612/373-5392
power generation

Mr. Kevin Burke
Senior International Relations Specialist
Nuclear Regulatory Commission
One White Flint North Building
11555 Rockville Pike
Rockville, MD 20852
ph: 301/415-2317
fax: 301/415-2395
government/A&E

Mr. John Carver
Executive Vice President
Occidental Petroleum Corporation
1200 Discovery Lane
Bakersfield, CA 93309
ph: 805/321-6000
fax: 805/322-7457
oil and gas

Ms. Jane Wales
Associate Director for National Security
and International Affairs
Office of Science and Technology Policy
Old Executive Office Building, Room 494
Washington, DC 20500
ph: 202/456-2894
fax: 202/456-6028
government

Mr. Dana Marshall
Senior Advisor for International Economic Affairs
Office of the Vice President
Old Executive Office Building
Washington, DC 20501
ph: 202/395-6013
fax: 202/395-6042
government

Mr. Bernard Cherry
President
Oxbow Power Corporation
1601 Forum Place
West Palm Beach, FL 33401
ph: 407/697-4300
fax: 407/640-8847
power generation

Dr. Sun Chun
Director
Pittsburgh Energy Technology Center
P.O. Box 10940
Pittsburgh, PA 15236-0940
ph: 412/892-6128
fax: 412/892-6127
government/coal

Mr. Louis J. Sas
President
Raytheon
2 World Trade Center
New York, NY 10048
ph: 212/839-2972
fax: 212/839-2571
A&E

Mr. Wade Greene
Phlianthropic Advisor
Rockefeller Family Trust
30 Rockefeller Plaza
New York, NY 10112
ph: 212/649-5600
fax: 212/649-5859
environment

Ms. Joyce Chang
Director, Emerging Markets
Salomon Brothers
7 World Trade Center, 36th Floor
New York, NY 10048
ph: 212/783-6745
fax: 212/783-2806
finance

Mr. Peter Geldart
Director & Head
Power Group - Asia Pacific
Salomon Brothers Hong Kong Ltd.
20th Floor, Three Exchange Square
Hong Kong
ph: 852-2501-2060
fax: 852-2501-8115
finance

Mr. Kenneth T. Kostal
President
Sargent & Lundy
Mid-Continental Plaza
55 East Monroe
Chicago, IL 60603
ph: 312/269-7713
fax: 312/2693871
A&E

Mr. Lynn Coleman
Partner
Skadden, Arps, Slate, Meagher & Flom
1440 New York Avenue, NW
Washington, DC 20005
ph: 202/371-7600
fax: 202/371-7945
finance

Dr. Donald Smith
Chairman and Chief Executive Officer
Smith Cogeneration
210 West Park, Suite 810
Oklahoma City, OK 73102
ph: 405/235-0900
fax: 405/235-0989
power generation

Hon. David Walters
Vice President
Smith Cogeneration
210 West Park, Suite 810
Oklahoma City, OK 73102
ph: 405/235-0900
fax: 405/235-0989
power generation

Mr. Robert Freling
Director of International Program
Solar Electric Light Fund
1739 Connecticut Avenue, NW
Washington, DC 20009
ph: 202/234-7265
fax: 202/
renewables

Mr. Ray Harris
Vice President
Southern Electric International
900 Ashwood Parkway, Suite 500
Atlanta, GA 30338
ph: 404/392-6982
fax: 404/393-9871
power generation

Mr. Roger Little
President
Spire Corporation
One Patriots Park
Bedford, MA 01730-2396
ph: 617/275-6000
fax: 617/275-7470
renewables

Mr. David C. Crikelair
Vice President
Texaco, Inc.
2000 Westchester Avenue
White Plains, NY 10650
ph: 914/253-7692
fax: 914/253-7744
oil and gas/coal

Mr. Kevin Maney
Editor and Reporter
USA Today
1000 Wilson Boulevard
Arlington, VA 22229
ph: 703/276-3400
fax: 703/276-3476
press

Mr. Robert Thoresen
Director, Government Relations
Voith Hydro
1655 North Fort Meyer Drive
Arlington, VA 22209
ph: 703/351-5288
fax: 703/525-8841
renewables

Mr. Nathaniel Woodson
President, Energy Systems Business Unit
Westinghouse Electric Corporation
4350 Northern Pike
Monroeville, PA 15146
ph: 412/374-6500
fax: 412/374-3851
power generation

Mr. James F. Wood
Senior Vice President and General Manager
Wheelabrator Environmental Systems, Inc.
Liberty Lane
Hampton, NH 03842
ph: 603/929-3281
fax: 603/929-3135
coal

Mr. Roger Dower
Director, Climate, Energy & Pollution Program
World Resources Institute
1709 New York Avenue, N.W.
Suite 700
Washington, DC 20006
ph: 202/638-6300
fax: 202/638-0036
environment

Mr. Kenneth C. Karas
President & CEO
Zond Systems, Inc.
13000 Jameson Road
P.O. Box 1910
Tehachapi, CA 93581
ph: 805/822-6835
fax: 805/822-7880
renewable energy

(b)(2)

DOE Official Delegation

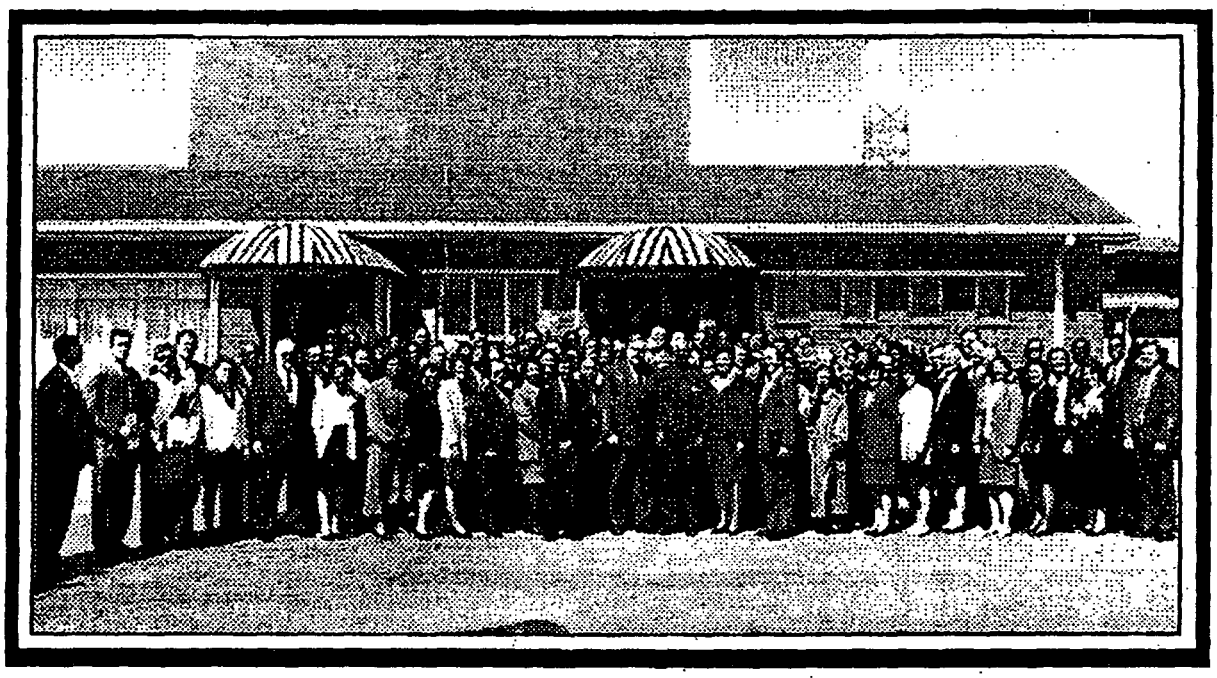
Hazel R. O'Leary
Secretary of Energy
Susan Tierney
Assistant Secretary for Policy
Robert Nordhaus
General Counsel
Terry Lash
Assistant Secetary for Nuclear Energy
Rich Rosenzweig
Chief of Staff
Dirk Forrister
Special Assistant to the Secretary for Policy
Denise Swink
Deputy Assistant Secretary
Office of Energy Efficiency and Renewable Energy
Howard Felbus
Associate Deputy Assistant Secretary
Office of Fossil Energy
Johannah Dottori
Director, Office of Scheduling and Logistics
Steve Fried
Trip Coordinator, Office of the Secretary
Jack Carter
Special Assistant, Office of Fossil Energy
Don Juckett
Office of Fossil Energy
Bud Annan
Director, Office of Solar Technology
Robert Price
Director, Office of International Energy Relations

Kristin Suokko
Special Assistant, Office of Nuclear Energy
Steven Lee
Sr. Business Liaison, Office of Energy Exports
Joey Lucas
Trip Coordinator, Office of the Secretary
Audrey Hoffer
Public Affairs Specialist
Sam Grizzle
Public Affairs Officer
Tracey Hardy
International Affairs Specialist, Office of Policy
Carolyn Wallace
Executive Secretary to Mrs. O'Leary
Mary LaMorte
Office of Policy
Dawn Schrepel
Trade Mission Coordinator

(b)(2)

John Giedl
Energy Information Administration
Wilhemina Long
Office of Policy
Patricia Witczak
Office of Policy

CLINTON ADMINISTRATION DELEGATION ON SUSTAINABLE ENERGY & EMPOWERMENT TO SOUTH AFRICA -- August 20-27, 1995



STRENGTHENED KINSHIP

TRIP REPORT

September 13, 1995

LED BY

HAZEL O'LEARY, U.S. SECRETARY OF ENERGY

OVERVIEW OF THE TRIP

Capitalizing on the unprecedented opportunities offered by the new democracy in South Africa, Secretary of Energy Hazel R. O'Leary led a delegation of some 80 energy companies, financiers, environmental groups and government specialists to Cape Town, Johannesburg and Kimberley during August 18-28. The mission's work fell into three broad categories--government to government initiatives that support the South African Reconstruction and Development Program's electrification goals and promote cooperation in other areas, education and empowerment programs designed to develop the human resources to support energy development in South Africa, and 14 private sector agreements between South African and U.S. companies that will create jobs while electrifying the nation. At least 1,800 U.S. and South African jobs will be created as a result of the mission.

The mission was conducted in response to a request by President Mandela to President Clinton and Secretary O'Leary, followed up by an invitation from Minister of Mineral and Energy Affairs R.F. "Pik" Botha. As President Clinton stated in his letter to the delegation, "the mission focuses on one of the significant concerns that President Mandela mentioned to me during his visit to Washington last fall--providing South Africans with access to power, a critical ingredient in building a strong economy based on shared prosperity." During the mission, the Secretary and delegation members got down to the hard work of realizing that goal by identifying areas where policies and regulations need to be altered to attract private investment and strengthen energy partnerships between the U.S. and South Africa. The first meeting of the Sustainable Energy Committee of the Gore-Mbeki Binational Commission, held at the end of the week, served as a vehicle for keeping the focus on realizing that and other goals. The next meeting of the Binational Commission Sustainable Energy Committee will be the week before the Gore Mbeki meeting, to be held December 4 in Pretoria.

Secretary O'Leary accomplished her aim in fielding a delegation that represented the best of America from a broad spectrum of energy companies, financiers, environmental groups and government specialists. The delegation was organized into six energy sector subgroups, each of which had a dynamic mix of technical, commercial, environmental, capacity building, regulatory and financial expertise suitable to address specific areas of South Africa's energy sector. These six "pods" covered the mission's focus areas which were: electricity, oil and gas, renewables, efficiency, research and development, and finance.

The pods engaged their South African and private sector counterparts in discussions on their energy policies, focussing on opportunities, concerns and "next steps" in the process of encouraging private investment to help South Africa's energy sector and its economy grow. The centerpiece event for these discussions was a conference held in Johannesburg on August 23. Each working group developed a list of policy recommendations that were presented at a closing plenary session. These recommendations were then used as the cornerstone of U.S. comments for the policy roundtable with senior South African energy policy-makers held on Thursday, August 24 and the Sustainable Energy Committee meeting of the U.S./South Africa Binational Committee meeting, Friday, August 25.

The mission gave delegates many opportunities to highlight the missions themes of promoting private investment, assisting in building capacity, facilitating economic and environmental equity and advancing the goals of the Sustainable Energy Committee of the Binational Commission. The mission was timed to fit fortuitously with recently begun efforts by the new South African government to change its policy and regulatory frameworks to encourage economic growth. Both the energy ministry and the trade and investment ministry were in the process of drafting policy "green papers" where the current energy and overall trade and investment strategies would be examined and opened to public comment, with an eye toward policies to encourage economic growth and more equitable distribution of electricity.

The mission focussed particularly on offering expert advice on the energy policy green paper, through meetings with the mission's host, Energy Minister Pik Botha, and round table sessions with the Parliamentary Energy Committee chaired by ANC leader Marcel Golding and the policy roundtable led by Minister Botha. Formal Departmental comments on the paper, focussing on lessons already learned in the U.S. context, will be sent to the South Africans on September 20.

The Secretary met with President Mandela, and Deputy Presidents Mbeki and DeKlerk. She met several times with her official host Minister Botha and also met with Minister of Public Enterprises Sigcau, whose ministry received approval to assemble a task team to determine whether the electricity monopoly ESKOM should continue in its present form. Secretary O'Leary also met with Environment Minister Dawie De Villiers, Trade and Industry Minister Trevor Manuel, the Chairman of ESKOM, and the Chairman of the Atomic Energy Corporation of South Africa -- with whom she signed an historic peaceful uses of nuclear energy agreement at the end of the week. Secretary O'Leary's access to the nation's leadership signified the importance of the Clinton Administration mission to South Africa and the attention that will be paid to the recommendations made by the mission.

The Clinton Administration Mission to South Africa serves as an important first step in encouraging policy and regulatory changes that will result in greater private sector linkages between the U.S. and South Africa. It also strengthens the focus of the Sustainable Energy Committee of the Gore-Mbeki Binational Commission and will form the basis of new energy partnerships and a redefined bilateral relationship based on the opportunities and challenges offered by South Africa's abundant resources, democratic principles and the renewed energy of its people.

Accomplishments

The most significant indication of the mission's success was demonstrated by the fact that at least 1800 jobs in the U.S. and South Africa (a nation with 45% unemployment) will be created as a direct result of this mission. In an August 25 signing ceremony presided over by Secretary O'Leary and Minister of Mineral And Energy Affairs Botha, 14 private sector agreements , two Government to Government Statements of Intent, a new Agreement for Cooperation in the Peaceful Uses of Nuclear Energy, and a workplan for the Sustainable Energy Committee of the Gore-Mbeki Binational Commission were signed.

The private sector signings included the signing of three fast-track projects that will serve as models to create future joint ventures between U.S. and South African businesses. One of the fast-track projects, a Memorandum of Understanding between DOE's Sandia Laboratory, African Electrification Foundation, several private sector companies, Historically Black Colleges and Universities and the Guguletu Township was a direct result of the delegation's visit to the township during the mission. The agreement, which envisions vocational training in an enterprise zone, will draw investment for the development of a light industrial park. New access to electricity will enable this industrial park to provide jobs in brick manufacturing, textiles, electronic controls and lumber mill operations. When fully implemented, this single project could result in 1000 jobs.

The government to government agreements included statements of intent in the areas of collaboration on energy policy, science and technology, and the exchange of energy information and forecast trends. The two nations also entered into a new Agreement for Cooperation in the Peaceful Uses of Nuclear Energy. The Agreement recognizes the many significant and positive steps taken by South Africa with regards to nuclear non-proliferation. President Clinton approved the agreement on August 14, 1995, and authorized Secretary O' Leary to sign on behalf of the United States.

The signing of the Terms of Reference and the establishment of a workplan for the Sustainable Energy Development Committee of the Gore-Mbeki Binational Commission were key outcomes of the mission. The Binational Commission with South Africa (one of two binational commissions at that level) will serve as an important forum for realizing our goals of creating an energy policy framework which will attract foreign capital to meet South Africa's energy needs, and support education and empowerment initiatives to develop South Africa's human resource base.

Recommendations/Follow-up Activities

Recommendations and follow up activities are specified in the individual pod reports and the overall commitments matrix.

THEME PAPER

With its combination of abundant natural resources, democratic principles, and the renewed energy of its people, South Africa's new democracy provides unprecedented opportunities and challenges. Its bold leaders are committed to a strong economy based on shared prosperity. The United States shares South Africa's vision of a new democratic and prosperous future. We are the world's leader in developing energy policy development to stimulate investment. We are also leaders in supporting advanced technologies that break the linkage between economic development and environmental degradation. In March, 1995, Deputy President Mbeki and Vice President Gore signed a Statement of Intent to form a U.S. South Africa Binational Commission, thereby, launching a new area of partnerships between the two democracies. It is in the spirit of partnership that this Presidential Trade Mission on Sustainable Development will:

Promote Private Investment -- In addition to providing access to new sources of capital private investment fosters improved quality of life, economic efficiency, innovation and accelerates the integration of South Africa into the worlds economy. Our strategy is to advance joint ventures in sustainable energy between South African and American firms by encouraging policy and regulatory frameworks that facilitate private investment. Integral to the success of these efforts is the sharing of information and experience on policies and analytical tools.

Assist in Building Capacity -- South Africa's Reconstruction and Development Program goal necessitate the development of its energy sector to supply power for equitable economic growth, and services while providing for macroeconomic stability. The two thirds of South Africans who exist outside the economic mainstream need access to energy to lead more productive lives. By assisting in transfer of management, technical and scientific expertise in energy technology and development, the United States can help fuel economic growth, build lasting relationships, and create more jobs and opportunity in both South Africa and the United States.

Facilitate Economic and Environmental Equity -- Providing energy so that all its citizens can lead economically productive lives is a top priority of South Africa's leaders. Power is needed to provide lights, communications, and clean water to rural homes, schools, and health clinics. As the world leader in development and deployment of advanced technologies, the United States can assist in creating pilot projects, helping build an infrastructure for sustainable development, and devising strategies for supplying power off-grid, through renewable energy systems grid extension, and increasing end-use efficiency. In the process, opportunities for South Africa/U.S. partnerships in all energy sectors will flourish.

Advance the Goals of the Sustainable Energy Committee of the Binational Commission -- International collaboration, both bilateral and multilateral, is an important component in meeting South Africa's social, political and economic challenges. The United States is a key partner in this collaboration, particularly in the critical area of sustainable energy development. We join with South Africa in an effort to enhance participation by the previously disenfranchised majority as an important cornerstone to successful cooperation and a strong, long-term relationship. Together, we will prepare an action plan for energy development with the Energy Commission of our Binational Commission that advances the goals of the Reconstruction and Development Program and the terms of cooperation established by Vice President Gore and Executive Deputy President Mbeki.

South Africa Commitment Matrix

All outcomes except the Non-proliferation conference are within the Binational commission.

POLICY/INFORMATION

Outcomes	Action	Milestones	Resources	DOE Owner
• **Establish cooperation in energy data/information exchange**	Undertake Program to exchange data and train Department of Mineral and Energy Affairs staff	Statement of Intent signed August, 1995. Requested data material has been sent to S.A. Further data exchange awaiting the establishment of an Internet connection at DMEA. In process of developing a training agenda with the Energy and Development Resource Center.	DOE and DMEA	Kilgore/Rodekohr
• **Assist in development of a South African regulatory/energy policy.**	U.S. comments on South Africa's Green Paper Form workshops/seminars /internships for NER, Parliament, and ESKOM to focus on policy actions and share U.S. experience on wide range of energy policy issues.	Completed by September 8, 1995 Initial Workshop Dec. 95	DOE DMEA/ESKOM	Jhirad/Meyer
• **Conference in South Africa on Non-proliferation**	Draft and coordinate agenda (objectives, theme, scope, target audience, etc.)	Fall of 1995	U.S. and S.A., DOE, AEC, DMEA	Ken Luongo

• **Establishment of Energy Efficiency Policy and Regulation**	Form workshops/seminars /internships for NER, Parliament, and ESKOM to focus on policy actions and share U.S. experience on wide range of energy policy issues.	Draft plan complete by November 1995 Review of plan complete by January 1996 Issue of final plan and begin implementation by February 1996	DOE	Salmon-Cox
• **South Africa Energy Research and Capacity Building Partnerships program**	Establish a program which support South Africa energy-related research at traditionally black and white universities, technical training institutions, and research laboratories; program will foster strong energy research collaborations and create an environment conducive to sustained excellence and open participation.	Dec 95 - US and SA teams identified Jan-Sept 96 - Conduct planning workshops July 96 - initial exchanges begin Nov. 96 - full implementation	DOE and DOE National Laboratories	McCraney/Maguire
• **Power Pooling in Southern Africa**	Establish seminar in integrated power pool operations and management	Feb 96	DOE ESKOM, DMEA	Meyer/Baldwin
• **Integrated household energy delivery pilot projects**	Joint pilot projects to demonstrate three models (shack settlement, and informal settlement upgrade scheme, and a greenfield housing development) for electrification of urban housing in South Africa.	Support Made in the USA Housing Project the week of October 1, 1995 Demonstrate 3 models: Shack settlement by Feb 1996, Informal settlement by August 1996, and Greenfield by December 1996	DOE	Baldwin

FAST TRACK

• **Coal-bed methane project**	Identify partners to support South Africa's resource assessment	Progress by BNC Meeting, Dec. 1995	DOE	Baldwin
• **Successful Black Owned/Operated Renewable Energy Business**	Provide appropriate technical consultation to Suncorp	- Plant operational - System engineering capability January 1996	DOE, Sandia , NREL	Klimas/Arent
• **Gugulethu Township Industrial Park**	Conduct feasibility study to establish a light industrial park in the Gugulethu Township	Study Completed by December 1, 1995 Capital requirement by Dec.1, 1995 Industry/Skill requirements Dec 1 Vocational training initiated Feb 1, 1996	DOE, Sandia, Oak Ridge Lockheed/Martin, USAID, Southern African Enterprise Development Fund, Renaissance/ Monitor AEF and US industry	Klimas

RENEWABLE TECHNOLOGY

• **US PV Powered Clinic Dedicated by President Mandela**	Supply single PV clinic system and install in the Rosenkranz clinic	November 1, 1995	DOE, Sandia, NREL, Independent Development Trust	Arent
• **Model Clinics Program**	Qualify US PV power systems for installation in the 2000 clinics to be electrified by PV under the RDP	• Program defined • U.S. technical support initiated • Full implementation awaiting funding	DOE Sandia Laboratory Independent Development Trust, and US industry Funding for U.S. participation needed in FY 1996 $800K	Klimas
• **Renewable Energy Financial Infrastructure Development** (REFA)	Prepare an inventory of financing schemes for renewable energy based rural electrification and select pilot implementation.	Dec. 95	DOE Sandia, NREL, NRECA	Klimas/Arent
• **Provincial level initiation of renewable energy applications** (Northern Cape)	Prioritize renewable energy technology applications with Northern Cape government and select/field 2-3 demonstration projects	Prioritization by Dec. 1 Demonstration Selected Feb. 1, 1996	DOE Sandia NREC, DMEA, CSIR, and Northern Cape government	Arent/Klimas

FOSSIL FUELS

• **Analysis of Legal Constraints Project to institute a gas market**	Coordination of Institutions, Review Green Paper	Completion before December 1995	DMEA, U.S. DOE, Private Sector	Juckett/Browning
• **Seminar to review financial regimes, contract terms and conditions for natural gas**	U.S. institutions to assist in review; joint ventures to be established	Completion before December 1995	U.S. and S.A., DOE, DMEA, SOEKOR, CEF, SASOL	Juckett/Browning
• **Study involving an Integrated Analysis of Natural Gas Resources and Markets**	Compile necessary models on U.S./foreign gas markets; gather information from S.A. institutions (RSA, DMEA),	Completion by December 1996	U.S. and S.A., DOE, DMEA, Utilities, Electric Power Research Institute	Juckett/Browning

ENVIRONMENTAL/EFFICIENCY

• **US/SA teams in the transportation, buildings, medium and small industry segment, and large industry segment to address action items identified in the Energy Summit**	Establish public and private US/SA teams with identified team leaders to address identified action items in each of the four areas; establish US/SA coordinating committee to oversee these activities Complete action plan development Complete coordinating committee review; establish priorities and begin implementation	Completion by: October 24, 1995 November 17, 1995 December 4, 1995	U.S. industry, DOE and S.A. industry	Swink/Salmon-Cox
• **A program for Jint Implementation with S.A. Dept. of Environmental Affairs and Tourism**	Negotiate final Statement of Intent for signature in December 1995.	Draft statement by October 1995 Final Statement by November 1995 Define Program March 1996	U.S., DOE, State Interest, EPA S.A. Environmental Affairs and Tourism	Silverman
• **Energy Efficiency Center**	Await SA decision on energy efficiency center Prepare preliminary technology transfer plan Complete plan review by interested stakeholders Issue final technology transfer plan and begin implementation	-- 30 days after SA decision 60 days after SA decision 90 days after SA decision	DOE and others tbd	Swink/Salmon-Cox

• Low-smoke fuels	Develop workshop to investigate substitutes for high polluting fuels with environmentally superior fuels.	Feb. 96	DOE and others tbd	Baldwin/Meyer

CAPACITY BUILDING

• **Capacity building in the field of manufacturing and business methods**	Establish a manufacturing institute for 15 black South African business professionals at Oak Ridge.	Completion by November 1, 1995.	U.S. and Martin Marietta Energy Systems	McCraney
• **Technical capacity building**	Establish a technical exchange program for 100 black South Africans with U.S. utilities.	Completion by January 1, 1996.	African Electrification Foundation (AEF) and U.S. utility companies	McCraney
• **Capacity Building in Oil and Gas Industry Project**	Undertake Program to train South Africans, exchange of students and personnel	June 1997	U.S. and South Africa, Academic Institutions, Private Sector	Juckett/Browning
• **Capacity building in renewable energy technology industry**	Sponsor a 5-yr training program for Renewable Energy Technology with the Peninsula Technikon to involve 20 students and 12 educators.	Five year program 20-30 yearly graduates in summer	U.S. and S.A., REFAD and Pennisula Technikon	Klimas
• **Professional capacity building**	Establish a scientist exchange program with CSIR for exchanging 50 black South Africans with U.S. scientists	Dec. 95	DOE, CSIR, FRP, USAID, National Laboratories & HBCU Partnerships	McCraney/Maguire
	Establish a regulatory and policy exchange program for exchanging 15 senior analysts.	initiate in Jan. 96	U.S. and S.A., DOE other federal regulatory agencies, Dept. of Public Enterprises	McCraney/Jhirad

• **Educational capacity building**	Student/Professor Exchange program with the Technikon of Northern Transvaal -- 2 professors and 3 students	Sept. 96	U.S. and S.A., DOE HBCUs, Technikon	McCraney/Maguire
	Establish 50 internships for black South African science students at DOE labs	Summer 96	DOE laboratories and HBCU's	" "
	Identification of appropriate U.S. technical colleges and sponsor a program that shares materials, programs, and approaches	Jan. 96	U.S. and S.A., DOE, technical schools, and National Laboratories&U.S. HBCU's	" "

MASTER SCHEDULE

Friday, August 18

12:30-
1:30pm Delegation Meeting and Briefing
SITE: Signature Aviation, Dulles Airport

2:00pm Depart Washington, D.C. enroute Cape Town, South Africa
NOTE: Pod meetings on plane

Saturday, August 19 -- Cape Town

3:30pm Arrive Cape Town, South Africa
MET BY: Minister of Mineral and Energy Affairs Pik Botha
Ambassador Princeton Lyman
Steven Fried
NOTE: Arrival statement to media

5:30-
7:30pm **In-Country Briefing and Welcome reception hosted by Ambassador Lyman**
SITE: Ambassador's Residence
ATTENDEES: Official Delegation
ATTIRE: Casual

Sunday, August 20 -- Cape Town

7:00-
9:00am **Delegation breakfast**
SITE: Cape Sun Hotel, Tastevin Restaurant, 1st floor
NOTE: Briefing at 8:30am

8:30-
9:30am **Secretarial Staff meeting**
SITE: Secretary's Work Room

9:00am-
12:00pm **Oil and Gas Pod Geological site visit**
NOTE: Charles Brown to handle logistics

11:00am-
12:45pm **Visit to Renewable Energy for African Development training site**
SITE: Peninsular Technicon
NOTES: Reception and light lunch at conclusion of event
Casual attire
ATTENDEES: Secretary plus Renewables pod and interested Delegates

B

Sunday, August 20, Cont. -- Cape Town

1:00- 3:00pm **Visit to Guguletu Township**
SITE: Guguletu
NOTES: Computer and Book donation at school in Guguletu
ATTIRE: Casual
ATTENDEES: Secretary plus interested Delegates

5:00-
6:00pm **Secretarial Staff Meeting**
SITE: Secretary's Work Room

Monday, August 21 -- Cape Town

7:00-
8:30am **Secretarial Staff Meeting**
SITE: Secretary's Work Room

7:30-
8:30am **Delegation Breakfast and Meeting**
SITE: Cape Sun Hotel, Tastevin Restaurant, 1st floor

9:00-
10:00am **Bilateral meeting with Minister of Mineral and Energy Affairs Botha**
SITE: Waalburg Conference Center, 6th floor conference room
ATTENDEES: Secretary, Ambassador, notetaker plus 22

10:00-
10:30am **Media Availability**
SITE: Waalburg Conference Center, 6th floor conference room

9:30am-
1:30pm **Electricity Pod site visit to electrification project**

10:30-
11:30am **Efficiency Pod meeting with Dick Dutkiewicz**
SITE: Stellenbosch Room, 2nd floor

12:00-
1:30pm **Business Delegation Lunch with the Organization for Economic Development of the Western Cape (WESGRO)**
SITE: Cape Sun Hotel, VOC South, 3rd floor
NOTE: Mark Chupka to handle event

2:00-
4:00pm **Roundtable Meeting with Parliament Energy Committee**
SITE: Old Assembly Chamber
ATTENDEES: Entire Delegation, Ambassador plus 17 at the table

Monday, August 21, Cont. -- Cape Town

5:00-
6:00pm **Bilateral Meeting with Deputy President de Klerk**
SITE: Deputy President's Office
ATTENDEES: Secretary, Ambassador, notetaker plus 12

5:30-
6:00pm **Press briefing**
SITE: Cape Sun Hotel, Constansia room, 2nd floor

7:00-
8:30pm **Welcome cocktail reception hosted by Minister Botha**
SITE: Groot Constantia Estate
NOTE: Secretary O'Leary arriving at 7:30pm
ATTIRE: Business
ATTENDEES: Entire Delegation

9:00-
9:30pm **Delegation Meeting**
SITE: Cape Sun Hotel, VOC North, 3rd floor

10:00pm **DOE Trip Team meeting**
SITE: Staff room

Tuesday, August 22 -- Cape Town and Johannesburg

7:00am Charter plane departs enroute Johannesburg

7:00am Other Delegates depart enroute Johannesburg via commercial flight

9:00am Charter plane arrives Johannesburg Airport

10:00-
10:30am **Factory Ribbon Cutting and Tour of Photovoltaic Manufacturing Facility**
SITE: 55, 12th Rd, Kew, Wynberg
PARTICIPANTS: Secretary plus Renewables pod plus interested Delegates

11:00-
11:50am **Visit to Ipolokeng School**
SITE: Soweto
NOTES: Dedicate photovoltaic electricity system
Computer and Book donation at school.
Computer to be powered by newly-installed PV panels
ATTENDEES: Secretary plus Renewable pod plus interested Delegates

Tuesday, August 22, Cont. -- Johannesburg

2:15-
3:15pm **Meeting with Deputy President Mbeki**
SITE: Sun City Palace Hotel, Royal Suite
PARTICIPANTS: Secretary O'Leary, Ambassador Lyman, Rich Rosenzweig, Johannah Dottori, Frank Stewart, Steven Fried

POD EVENTS

12:30-
2:00pm Electricity and Oil and Gas Pod meeting with Sasol

2:00-
3:30pm Efficiency Pod meeting with SAPPI paper producer

2:30-
4:30pm Electricity and Oil and Gas Pod meeting with Chamber of Mines

4:00-
4:45pm Efficiency Pod meeting with Chamber of Mines

4:30-
5:30pm Meeting with National Electricity Regulator Ian MacRae

5:00-
5:30pm Efficiency Pod meeting with Steel and Engineering Industries Federation

6:30-
7:00pm Press Briefing

Wednesday, August 23 -- Johannesburg

7:00-
8:15am **Delegation Meeting and Breakfast**
SITE: Carlton Hotel, Top of The Carlton, 30th Floor
NOTE: Briefing begins at 7:30am

7:30-
8:15am **Meeting of Summit Breakout Session Chairs and Coordinators**
SITE: Carlton Hotel, Boemfontein room, 4th floor

8:30-
10:00am **Energy Summit Opening Plenary Session**
SITE: Carlton Hotel, Cape room, function level
NOTE: Presentations by Secretary O'Leary and Minister Botha

Wednesday, August 23, Cont. -- Johannesburg

Secretary O'Leary's Agenda

10:30-
11:30am **Media Opportunities**
SITE: Carlton Hotel

2:45-
3:30pm **Meeting with Atomic Energy Corporation CEO Stumpf**
SITE: Carlton Hotel, room 905
NOTE: Minister Botha attending

3:45-
4:30pm **Meeting with Minister of Public Enterprises Sigcau**
SITE: Carlton Hotel, room 801
ATTENDEES: Secretary, Ambassador, notetaker plus 13

Delegation Agenda

10:15am-
12:45pm **Energy Summit Breakout session discussions**
Breakout sessions: Urban Household Energy Supply and Use
Rural Energy Supply and Use
Conventional Approaches to Electricity Supply
New Approaches to Energy Supply
Energy Efficiency
Gas Market Development and Liquid Fuels

12:45-
2:15pm **Energy Summit Lunch -- Topic: Capacity Building, Finance and Environment**
SITE: Carlton Hotel, Top of the Carlton, 30th Floor

2:30-
4:30pm **Energy Summit Breakout session discussions, conclusions**

Secretary and Delegation

4:45-
6:00pm **Energy Summit Reporting Session**
SITE: Carlton Hotel, Cape room, 4th floor

6:00-
6:30pm **Press Briefing**
SITE: Carlton Hotel, Boemfontein room, 4th floor

6:00-
8:00pm **Reception hosted by Secretary O'Leary**
SITE: Carlton Hotel, Top of the Carlton, 30th Floor
ATTENDEES: Entire Delegation plus others

Thursday, August 24 -- Johannesburg

7:00-
7:30am **Secretarial Staff Meeting**
SITE: Secretary's Work Room

7:00-
7:30am **Delegation breakfast and Meeting**
SITE: Carlton Hotel, Top of the Carlton, 30th Floor

8:30-
9:30am **Secretary visits Technicon of the Northern Transvaal**
ATTENDEES: Secretary O'Leary
Rich Rosenzweig
Corlis Moody
Fredrick Humphries
Corlis Moody
Johannah Dottori
Mae Jemison

8:00-
10:00am **Financing Roundtable**
SITE: Carlton Hotel, Cape room, 4th floor
PARTICIPANTS: Entire Delegation invited, 10 at table

George Avery
David Benhke
Jude Kearney
Musheer Robinson
Ken Woodcock
Julie Belaga
Clarence James
Tine Poitevein
Pete Smith
Marc Chupka

8:30-
10:00am **Delegation Visit to Ipolokeng School**
PARTICIPANTS: Interested Delegates

11:15am **Meeting and Photograph with President Mandela**
SITE: Waterkloof Airforce Base
ATTENDEES: Entire Delegation

1:00-
2:30pm **Meeting with ESKOM Chairman and CEO**
SITE: Executive Board and Dining Rooms, ESKOM Building, Megawatt Park
ATTENDEES: Secretary O'Leary
Ambassador Lyman
Commissioner Hoecker
Larry Byrne, US AID
Robert Nordhaus, DOE
Rich Rosenzweig, DOE
Denise Swink, DOE
Dana Marshall, OVP
Ken Woodcock, AES
Clark Gellings, EPRI
George Avery, Shaw Pittman

Thursday, August 24, Cont. -- Johannesburg

Meeting with Eskom Chairman and CEO

Mary Boyd, Duke Power
Paul Koeppe, Superconductivity, Inc.
David Benhke, J.P. Morgan
Nari Hingorani, EPRI
John Bradburne, Fluor Daniel
David Jhirad, DOE
George Edwards, Amoco
Karl Butler, ICC
Pete Smith, NRECA
Larry Papay, Bechtel
Charles Condy, Proven Alternatives
Hank Keohane, Keohane & Keegan
Joel Bennett, Parsons Engineering
David Reichle, Oak Ridge
Musheer Robinson, Marsh & McLellan
Nancy Bacon, ECD
Mae Jemison, Jemison Group
Terri Tran, DOE
Art Baldwin, DOE

1:00-
2:30pm **Renewables Pod meeting with Center for Scientific and Industrial Research**

3:30-
5:30pm **Roundtable: Making Energy Policy**

SITE: Carlton Hotel, Loveld Room, 2nd floor
ATTENDEES: Entire Delegation
PARTICIPANTS: Secretary O'Leary
Ambassador Lyman
Rich Rosenzweig, DOE
Bob Nordhaus, DOE
Jane Wales, OSTP
Martha Krebs, DOE
Amb. Spearman, REFAD
Clark Gellings, EPRI
Vello Kuuskraa, ARI
Wendall Holland, Reed, Smith...
Mike Kammerer, Dresser
Charles Condy, Proven Alternatives
Dan Dudek, Environmental Defense Fund
Terry Thorn, Enron
Emmet George, Iowa Public Utilities
Cheryl Alexander, Alexander Companies
Mannie Jackson, Honeywell

Thursday, August 24, Cont. -- Johannesburg

6:00-
6:30pm **Press Briefing**
SITE: Carlton Hotel, Bloemfontein room, 4th floor

7:30-
9:30pm **Dinner hosted by American Chamber of Commerce**
SITE: Carlton Hotel; Highveld room, 2nd floor
NOTE: Presentations by Secretary O'Leary and Minister Botha
ATTENDEES: Entire Delegation

Friday, August 25 -- Johannesburg

7:00am **Delegation Meeting**
SITE: Carlton Hotel, Top of the Carlton, 30th Floor

9:00-
10:00am **Bilateral Meeting with Minister of Trade and Industry Manuel**
ATTENDEES: Secretary O'Leary
Ambassador Lyman
Rich Rosenzweig, DOE
Jude Kearney, Commerce
Larry Byrne, U.S. AID
Julie Belaga, Ex-Im
Ken Woodcock, AES
Andrea Lockwood, DOE
Mannie Jackson, Honeywell
Rodney Webb, Destec
Michael Clark, Atlantic Pacific Technology
Jerome Davis, Cummins
Dr. Fred Humphries, Florida A&M
Lilia Abron, PEER Consultants
Tina Poitevien, Washington, Hackett...
Dana Marshall, OVP

10:30-
11:30am **Meeting of Energy Committee of Binational Commission**
SITE: Union Buildings, Pretoria Room 259
ATTENDEES: Entire Delegation
PARTICIPANTS: Secretary O'Leary
Julie Belaga
Larry Byrne
Jude Kearney
Regina Brown
Frank Stewart
Jane Wales
Martha Krebs
Dana Marshall

Friday, August 25, Cont. -- Johannesburg

11:30am-
12:30pm **Signing Ceremony for Bilateral Agreements and Business Deals**
SITE: Union Buildings Courtyard, Pretoria
ATTENDEES: Entire Delegation

12:30-
1:00pm **Press Conference**
SITE: Union Buildings, Pretoria Room 259

1:00-
3:00pm **Renewable pod visit to Solar Homes**

Saturday, August 26 -- Johannesburg and Kimberley

9:00am Depart Johannesburg enroute Kimberley Airport

10:00am Arrive Kimberley Airport
Met by Premier Dipico, Premier of the Orange Free State, other VIPs
NOTE: Welcome statements and cultural program

10:30am Depart enroute Kimberley Museum

10:45am Arrive Kimberley Museum

10:45-
11:15am **Coffee and Reception**

11:15am-
12:45pm **Roundtable on Provincial Issues, Energy and Empowerment**
ATTENDEES: Entire Delegation
PROGRAM: Welcome by Premier Dipico
Welcome by Secretary O'Leary
South African presentation on specific needs, potential areas of cooperation
Empowerment and Capacity Building
Electricity
Renewables
Mining
Financing
U.S. response
Discussion
Conclusions

12:45-
1:15pm **Reception and informal discussion with provincial business leaders**

1:40-
3:00pm **Luncheon hosted by Premier Dipico**
SITE: Savoy Hotel
NOTE: Toast by Secretary

Saturday, August 26, Cont. -- Kimberley

4:00pm	Depart Kimberley Airport enroute Johannesburg for refueling
5:00pm	Arrive Airport
9:30pm	Depart enroute Cape Town
11:30pm	Arrive Cape Town
12:30am	Arrive Cape Sun Hotel

Sunday, August 27 -- Cape Town

11:30am	Depart enroute Washington, D.C.

Monday, August 28 -- Washington, D.C.

2:30am	Arrive Washington Dulles Airport

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Dr. Vello A. Kuuskraa
President
Advanced Resources International
1110 North Glebe Road, Suite 600
Arlington, VA 22201
(703) 528-8420 office
(703) 528-0439 fax
oil and gas

Mr. Ed Romero
Chairman
Advanced Sciences, Inc.
6739 Academy Road, NE
Albuquerque, NM 87109
(505) 828-0959 office
(505) 828-0173 fax
environment

Mr. Ken Woodcock
Senior Vice President
AES Corporation
1001 North 19th Street, Suite 2000
Arlington, VA 22209
(703) 522-1315 office
(703) 528-4510 fax
Electricity

Mr. John Butler
Vice President
African Electrification Foundation
5120 West Goldleaf Circle, Suite 280
Los Angeles, CA 90056
(213)298-1040 office
(213)298-4580 fax
electricity

Mr. C. Payne Lucas
Africare
440 R Street, NW
Washington, DC 20001
(202) 462-3614 office
(202) 387-1034
policy

Ms. Cheryl Alexander
CEO
Alexander Companies
3205 Casco Circle
Wayzata, MN 55391
(612) 471-0121 office
(612) 471-7434 fax
capacity buiilding

Mr. George Edwards
Vice President of International Negotiations
Amoco Exploration & Production Co.
P.O. Box 3092, Room 21188
Houston, TX 77253-2696
(713) 366-4543 office
(713) 366-5717 fax
oil and gas

Mr. Mark Sawyer
Vice President
ARCO International Oil and Gas
New Business Ventures
2300 West Plano Parkway
Plano, TX 75075
(214) 509-6684 office
(214) 509-3090 fax
oil & gas

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Mr. D. Michael Clark
President
Atlantic-Pacific Technologies, Inc.
44853 Fremont Boulevard
Fremont, CA 94538
(510) 651-9995 office
(510) 651-9841 fax
renewables

Dr. Larry T. Papay
Senior Vice President
Bechtel Group, Inc.
50 Beale Street
Mail Stop 50/17/B36
San Francisco, CA 94105-1895
(415) 768-0275 office
(415) 768-0503 fax
energy efficiency

Mr. Ed Badolato
Bogart Environmental Services
2202 Kings Garden Way
Falls Church, VA 22043
(703) 821-7725 office
(703) 821-7789 fax
environment

Mr. Cordell Reed
Senior Vice President
Commonwealth Edison
1 First National Plaza, 10 Dearborn - 37th Floor
Chicago, IL 60603
(312) 394-3121 office
(312) 394-3110 fax
electricity

Mr. Jerome Davis
President
Cummins Power Generation
500 Jackson Street
Mail Code 60125, P.O. Box 3005
Columbus, IN 47202-3005
(812) 377-3743 office
(812) 377-4453 fax
renewables

Deputy Assistant Secretary Regina Brown
Bureau for African Affairs
Department of State
Room 6234-A
Washington, DC 20520
(202) 647-1818 office
(202) 647-6301 fax
Binational Commission

Mr. Jude Kearney
Deputy Assistant Secretary for Service Industries and Finance
Department of Commerce
Room 1128
14th Street & Constitution Avenue, NW
Washington, DC 20230
(202) 482-5261 office
(202) 482-4775 fax
Binational Commission

Mr. Rodney Webb
Senior Vice President
Destec Energy
2500 Citywest Blvd, Suite 150
Houston, TX 77042
(713) 735-4229 office
(713) 735-4059 fax
electricity

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Mr. Michael Kammerer
President
Dresser Valve & Control
10077 Grogans Mill Road, Suite 500
The Woodlands, TX 77380
(713) 367-5741 office
(713) 363-8244 fax
oil and gas

Ms. Mary T. Boyd
Vice President, Corporate Services
Duke Engineering & Services
230 South Tryon Street, Suite 400
Charlotte, NC 28202
(704) 382-8024 office
(704) 382-8389 fax
electricity

Mr. Jan Hartke
President
Earthkind International
2100 L Street, NW, Suite 500
Washington, DC 20037
(202) 778-6149 office
(202) 778-6134 fax
environment

Mr. Robert Eggleston
President and CEO
EFH Coal Company
89 Miller Street
West North End Station
Wilkes-Barre, PA 18705
(717) 823-7664 office
(717) 829-4515 fax
electricity

Ms. Nancy Bacon
Senior Vice President
Energy Conversion Devices, Inc
1675 West Maple Road
Troy, MI 48084
(810) 280-1900 office
(810) 280-1456 fax
renewables

Mr. Richard Guy
Vice President
Energy Initiatives, Inc.
1 Upper Pond Road
Parsippany, NJ 07054
(201) 263-6953 office
(201) 263-6977 fax
electricity

Mr. Terence Thorn
Senior Vice President
Government Affairs & Public Policy
Enron Corporation
P.O. Box 1188
1400 Smith Street
Houston, TX 77251-1188
(713) 853-6161 office
(713) 646-4831 fax
oil and gas

Mr. Dan Dudek
Senior Economist
Environmental Defense Fund
257 Park Avenue South
New York, NY 10010
(212) 505-2100 office
(212) 505-2375 fax
environment

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Mr. Clark Gellings
Vice President
EPRI
3412 Hillview Avenue
Palo Alto, CA 94303
(415) 865-2000
(415) 855-8501
electricity

Dr. Nori Hingorani
Vice President
EPRI
26480 Weston Drive
Los Altos Hills, CA 94022
(415) 941-4309 office
(415) 941-5240 fax
electricity

The Honorable Julie Belaga
Member of the Board
Export-Import Bank of the United States
811 Vermont Avenue, NW
Washington, DC 20571
(202) 565-3540 office
(202) 565-3548 fax
Binational Commission

The Honorable James Hoecker
Commissioner
Federal Energy Regulatory Commission
825 North Capital Street, NE
Room 9300
Washington, D.C. 20426
(202) 208-0383 office
(202) 208-0151 fax
electricity

Dr. Frederick S. Humphries
President
Florida A&M University
Administration Center, Room 301
Tallahassee, FL 32307
(904) 599-3225 office
(904) 561-2152 fax
research & development

Mr. John Bradburne
Vice President
Fluor Daniel
800 Connecticut Avenue, NW, Suite 600
Washington, DC 20006
(202) 955-9314 office
(202) 833-1630 fax

Mr. John Coors
President
Golden Photon, Inc.
4545 McIntyre Street
Golden, CO 80403
(303) 271-7177 office
(303) 271-7410 fax
renewables

Mr. Mannie Jackson
Senior Vice President, International Programs
Honeywell, Inc.
P.O. Box 524
Minneapolis, MN 55440-0524
(202) 857-9801 office
(202) 857-9858 fax
energy efficiency

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Mr. Karl Butler
President
ICC Energy Corporation
311 North Market Street
Dallas, TX 75202
(214) 744-2204 office
(214) 744-2206 fax
oil & gas

The Honorable Emmitt George
Commissioner
Iowa Public Utilities Board
Lucas State Office Building, 5th Floor
Des Moines, IA 50319
(515) 281-5325 office
(515) 281-8821 fax
policy

Mr. David Benhke
Managing Director
J.P. Morgan & Company
60 Wall Street
New York City, NY 10260
(212) 648-7675 office
(212) 648-5335 fax
finance

Dr. Mae Jemison
Executive Director
Jemison Group, Inc.
P.O. Box 591455
Houston, TX 77259-1455
(713) 486-7918 office
(713) 486-7522 fax
policy

Mr. Tom Gannon
Vice President
Johnson Controls
507 East Michigan Street
Milwaukee, WI 53202
(414) 272-6424 office
(414) 228-2077 fax
energy efficiency

Mr. Clarence L. James, Jr.
President and CEO
Keefe Company (The)
444 North Capitol Street, NW
Suite 517A
Washington, DC 20001
(202) 638-7030 office
(202) 638-6784 fax
finance

Mr. Harold J. "Hank" Keohane
Partner
Keohane & Keegan
21 Custom House Street
Boston, MA 02110
(617) 951-1400 office
(617) 951-1354 fax
electricity

Mr. Michael Hodge
Marketing
L.A.S. Energy Corporation of Florida
1265 South Semoran Blvd.
Suite 1250, Building #4
Winter Park, FL 32792-5506
(407) 678-2600 office
(407) 678-3099 fax
oil and gas

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Dr. Ernest L. Holloway
President
Langston University
Langston, OK 73050
(405) 466-3388 office
(405) 466-3461 fax
capacity building

Mr. Musheer Robinson
Senior Vice President
National CSG Public Sector - Practice Leader
Marsh & McLennan
10 South Broadway
St. Louis, MO 63102-1719
(314) 342-2653
(314) 241-0751
finance

Mr. Frank Russell
Global Power Strategic
Advisory Services
Merrill Lynch and Company
250 Vesey Street, 27th floor
New York City, NY 10281-1327
(212) 449-9793 office
(212) 449-8636 fax
finance

Ms. Kathy O'Reilly
Molten Metal Technology
1615 L Street, N.W., Suite 540
Washington, DC 20036
(202) 835-8940 office
(202) 835-8938 fax
electricity

Dr. Walter Massey
President
Morehouse College
830 Westview Drive, SW
Atlanta, GA 30314
(404) 215-2645 office
(404) 659-6536 fax
research & development

Mr. Granville "Pete" Smith
South African Program Director
National Rural Electric Cooperative
Association
1800 Massachusetts Avenue, NW
Washington, DC 20036-1883
(202) 857-9686 office
(202) 857-4863 fax
renewables

Dr. David Reichle
AssociateDirector
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831
(615) 576-2900 office
(615) 241-2967 fax
research & development

Mr. Dana Marshall
Senior Advisor for International Economic
Affairs
Office of the Vice President
Old Executive Office Building
Washington, DC 20501
(202) 395-6013 office
(202) 395-6042 fax
Binational Commmission

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Ms. Jane Wales
Associate Director for National Security
and International Affairs
Office of Science and Technology Policy
Old Executive Office Building, Room 494
Washington, DC 20500
(202) 456-2894 office
(202) 456-6028 fax
Binational Commission

Mr. Joel Bennett
President
Parsons Engineering Science, Inc.
100 West Walnut Street
Pasadena, CA 99124
(818) 440-4412 office
(818) 440-6195 fax
environment

Dr. Lilia Abron
President
PEER Consultants
12300 Twinbrook Parkway,
Suite 410
Rockville, MD 20852
(301) 816-0700 office
(301) 816-9291 fax
environment

Mr. Jerome Foster
President and CEO
Pentech Energy
1250 24th Street, NW, Suite 350
Washington, DC 20037
(202)467-2797 office
(202)467-2796 fax
electricity

Mr. Charles Condy
President and CEO
Proven Alternatives, Inc.
601 California Street, #2200
San Francisco, CA 94108
(415) 781-2001 office
(415) 781-0552 fax
energy efficiency

Mr. Wendell F. Holland
Esquire of Counsel
Reed, Smith, Shaw, and McClay
2500 One Liberty Place
1650 Market Street
Philadelphia, PA 19103-7301
(215) 851-8100 office
(215) 851-1420 fax
electricity

Ambassador Leonard Spearman
Chairman of the Board
Renewable Energy for African Development
122 Street, NW, 4th floor
Washington, DC 20001-2109
(202) 383-2557 office
(202) 383-2555 fax
renewables

Ms. Jan Schori
General Manager
Sacremento Municipal Utility District
6201 S Street
Sacremento, CA 95817
(916) 732-5325 office
(916) 732-6562 fax
electricity

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Mr. Lindley DeGarmo
Director
Salomon Brothers
7 World Trade Center, 30th floor
New York City, NY 10048
(212) 783-5879 office
(212) 783-4164 fax
finance

Mr. George Avery
Shaw, Pittman, Potts, & Trowbridge
2300 N Street, NW
Washington, DC 20037-1128
(202) 663-8856 office
(202) 663-8007 fax
finance

Ms. Sharon Moore
Vice President - Business Development
Sithe Energies, Inc.
450 Lexington Avenue
New York, NY 10017
(212) 450-7345 office
(212) 450-9005 fax
electricity

Mr. John J. McAtee, Jr.
Vice Chairman
Smith Barney, Inc.
388 Greenwich Street, 34th floor
New York City, NY 10013-0060
(212) 816-6000 office
(212) 816-7029 fax
finance

Mr. Roger G. Little
President and CEO
Spire Corporation
One Patriots Park
Bedford, MA 01730-2396
(617) 275-6000 office
(617) 275-7470 fax
renewables

Mr. Paul Koeppe
President
Superconductivity, Inc.
2114 Eagle Drive
Middleton, WI 53582
(608) 828-9131 office
(608) 831-5793 fax
electricity

Mr. Larry Byrne
Assistant Administrator
Bureau for Management
U.S. Agency for International Development
320 21st Street, NW
Washington, DC 20523
(202) 647-8646 office
(202) 736-4147 fax
Binational Commission

Mr. Wilbur Thomas
Bureau for African Affairs
U.S. Agency for International Development
320 21st Street, NW
Washington, DC 20523
(202) 647-4344 office
(202) 736-4147 fax
Binational Commission

Clinton Administration Delegation on
Sustainable Energy and Empowerment to South Africa
OFFICIAL DELEGATION

Dr. Kneeland Youngblood
Director - Member of the Board
U.S. Enrichment Corporation
6903 Rockledge Drive
Betheda, MD 20817
(301) 564-3448 office
(301) 564-3202 fax
oil & gas

Ms. Tina Poitevien
Partner
Washington, Hackett, Poitevien & Co.
1500 Walnut Street, Suite 303
Philadelphia, PA 19102
(215) 772-1130 office
(215) 772-1416 fax
finance

Ms. Carol Earls-Franklin
Manager EEO/Employment
Western Resources
818 Kansas Avenue, P.O. Box 8890
Topeka, KS 66601
(913) 575-6511 office
(913) 575-6523 fax
capacity building/electricity

Mr. Kenneth C. Karas
President and CEO
Zond Systems, Inc.
1300 Jameson Road, P.O. Box 1910
Tehachapi, CA 93581
(805) 822-6835 office
(805) 822-7880 fax
renewables

OFFICIAL DELEGATION -- U.S. DEPARTMENT OF ENERGY

Secretary Hazel R. O'Leary
Richard Rosenzweig
Johannah Dottori
Bud Annan
Steven Fried
Corlis Moody
Janet Anderson
Bob Nordhaus
Christine Fletcher
Peter Salmon-Cox
Art Baldwin
David Meyer
David Jhirad
Mark Chupka
Dan Bouie
Joe Maguire
Barbara Semedo
Linda Silverman
Shirley Thomas
Terry Tran
Andrea Lockwood
Denise Swink
Frank Stewart
Joey Lucas
Percy McCraney
Marti Thomas
Ann Walls
Andrea Esquer
Dawn Shrepel
Martha Krebs
Reggie Spiller
Paul Klimas
Chris Sherring
Charles Brown

TERMS OF REFERENCE

OF THE SUSTAINABLE ENERGY DEVELOPMENT COMMITTEE OF THE UNITED STATES - SOUTH AFRICA BINATIONAL COMMISSION

Whereas, the Government of the United States of America and the Government of the Republic of South Africa established the United States-South Africa Binational Commission on March 1, 1995; and

Whereas, the Department of Energy of the United States of America and the Department of Mineral and Energy Affairs of the Republic of South Africa, referred to as the Participants, intend to facilitate cooperation in energy development, as follows:

Establishment of the Sustainable Energy Development Committee

I. The Participants hereby establish the Sustainable Energy Development Committee of the United States-South Africa Binational Commission, referred to as the Committee. The Committee will be co-chaired by the Secretary of Energy of the United States and the Minister of Mineral and Energy Affairs of the Republic of South Africa. The Committee will work on the basis of mutual agreement and adopt rules of procedure and work programs, as appropriate.

II. The membership of the Committee will consist of senior officials from appropriate departments and entities of the governments of the United States and South Africa. The Committee will meet regularly as mutually agreed by the Participants. Meetings will be held alternately in the United States and in South Africa.

III. As needed, the Committee will form ad hoc working groups to consider and report on specific activities. The Committee will determine the assignments of such working groups, which will conduct their work in accordance with these Terms of Reference.

Terms of Reference

IV. The Committee will facilitate the exchange of information and encourage bilateral discussions in order to provide advice and guidance to the Participants in the following areas:

A. Development and implementation of policies and programs relating to energy exploration, development, generation, transmission, distribution, use and management;

B. Development of secure supplies of energy resources that are economically competitive and environmentally acceptable, on a mutually beneficial basis;

C. Examination and implementation of activities required to develop a sustainable energy strategy for South Africa, including the development of infrastructure, as necessary to facilitate the efficient use of energy resources and the use of renewable energy resources and fossil energy technology;

D. Development of technology programs, including applied research and development and the promotion of a dialogue concerning current and future energy technology development in the United States, South Africa, the African continent, and the world, as appropriate;

E. Assistance in capacity building through energy-related training, development and transfer of skills and technology to support human resources development, policy development and institutional infrastructure, including the promotion of joint government-industry activities and faculty and student exchanges;

F. Establishing and facilitating cooperative activities in the fields of energy efficiency and renewable energy research, development and commercialization; fossil fuel technologies (including gas); clean coal and coal-bed methane recovery and utilization technologies; and energy technologies that enhance the environment, particularly technologies that mitigate the effects of greenhouse gases;

G. Facilitating the exchange of information and assessments on energy demand and supply forecasts and bilateral development of energy information systems; and

H. Promotion of private sector energy technology transfers between companies in the United States of America and in the Republic of South Africa.

General Provisions

V. All costs associated with participation in the Committee will be borne by the Participant that incurs them, unless otherwise agreed by the Participants.

VI. Activities under the Terms of Reference will be subject to the availability of appropriated funds and to the laws and regulations of the United States of America and the Republic of South Africa.

VII. The Participants may revise these Terms of Reference at any time, in writing.

Signed, in duplicate, at Pretoria, Republic of South Africa, this 25th day of August 1995.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA:

HAZEL R. O'LEARY
SECRETARY OF ENERGY

FOR THE DEPARTMENT OF MINERAL AND ENERGY AFFAIRS OF THE REPUBLIC OF SOUTH AFRICA:

ROELOF FREDERIK BOTHA
MINISTER OF MINERAL AND ENERGY AFFAIRS

JOINT STATEMENT OF INTENT
BETWEEN
THE DEPARTMENT OF ENERGY
OF THE UNITED STATES OF AMERICA
AND
THE DEPARTMENT OF MINERAL AND ENERGY AFFAIRS
OF THE REPUBLIC OF SOUTH AFRICA
ON AN ENERGY INFORMATION EXCHANGE

The Department of Energy of the United States of America and the Department of Mineral and Energy Affairs of the Republic of South Africa, hereafter referred to as the "Participants," intending to conduct an exchange of energy information, have reached the following understanding:

ARTICLE I

The Participants intend to establish a United States - South African sub-ministerial Working Group on Energy Information (hereafter referred to as the "Working Group") to facilitate and consult on the exchange of readily available energy statistics and other energy market information between the Participants.

The exchange of energy data and information will include, but not be limited to, the following:

(A) Annual energy market statistics (production, imports, exports, stocks, bunkers, transformation, demand, prices, and other data) for petroleum, natural gas, coal, electricity, fuelwood, and other forms of energy;

B) Other related data and information concerning fuel characteristics, fossil fuel heat values, refining capacity, reserves, and other energy information;

(C) Information concerning statistical methods, analytic techniques, and system documentation;

(D) Information about electronic information dissemination; and

(E) Exchange of personnel for the purpose of training on energy information collection and analysis and the facilitation of electronic communication between the Participants.

E.

ARTICLE II

For the purpose of promoting closer contacts and mutually beneficial consultations:

(A) The Working Group should consist of sub-ministerial officials and/or senior officials from the Participants. Participants, in consultations, may also include representatives from such other agencies as the Participants consider appropriate for the agenda of the consultations.

(B) The Energy Information Administration of the Department of Energy of the United States of America and the Chief Energy Directorate of the Department of Mineral and Energy Affairs of the Republic of South Africa jointly will coordinate cooperative activities contemplated by this Joint Statement of Intent. Each Participant will designate a Coordinator who will prepare for Working Group Meetings and who will be responsible for communications between the Participants.

ARTICLE III

The Working Group will be guided by the following procedures:

(A) In view of the significant distance between the two countries, electronic communication will be the preferred mode of communication between the Working Group members.

(B) Meetings of the Working Group or selected members from the Working Group may be held upon agreement of the Participants.

(C) The agendas for all meetings should be determined and agreed by the Participants. Minutes will be ratified and signed immediately after each meeting.

(D) Working Group members will be responsible for their own travel and lodging expenses. It is expected that the Participant hosting the Working Group meeting will pay the costs for arrangements associated with the meeting.

Signed, in duplicate, at Pretoria, Republic of South Africa, this 25th day of August, 1995.

FOR THE
DEPARTMENT OF ENERGY
OF THE
UNITED STATES OF AMERICA:

HAZEL R. O'LEARY
SECRETARY OF ENERGY

FOR THE
DEPARTMENT OF MINERAL AND
ENERGY AFFAIRS OF THE
REPUBLIC OF SOUTH AFRICA:

ROELOF FREDERIK BOTHA
MINISTER OF MINERAL AND
ENERGY AFFAIRS

JOINT STATEMENT OF INTENT
BETWEEN
THE DEPARTMENT OF ENERGY
OF THE UNITED STATES OF AMERICA
AND
THE DEPARTMENT OF MINERAL AND ENERGY AFFAIRS
OF THE REPUBLIC OF SOUTH AFRICA
ON ENERGY POLICY, SCIENCE AND TECHNOLOGY, AND DEVELOPMENT

The Department of Energy of the United States of America and the Department of Mineral and Energy Affairs of the Republic of South Africa, hereinafter referred to as the "Participants."

Having an interest in cooperating in the areas of energy policy, science and technology, and development;

Having a mutual interest in exchanging experience and views on opportunities for the utilization of energy and environmental technologies and in fostering collaboration between their two countries in these areas; and

Noting that energy security and the quality of life can be enhanced through the effective and environmentally-sound utilization of energy sources, including fossil fuels, renewable energy, and energy efficiency technologies, and that mutual cooperation to support such uses would promote increased economic interaction, facilitate technology transfer, accelerate the commercialization of certain energy systems and products, and expand opportunities for international trade between the United States and South Africa;

The Participants declare their intentions as follows:

1. The Participants intend to facilitate joint activities related to energy policy, science and technology, development, and commercialization in an environmentally and economically sound manner in areas of mutual interest. These intended joint activities may include, but are not limited to, the following:

   (A) Exchange of scientists, engineers and other specialists for participation in agreed research, development, analysis, design, and experimental activities conducted;

   (B) Organizing and participating in seminars and other fora on specific mutually agreed topics;

   (C) Providing training support to strengthen human resources and institutional infrastructure or capacity building (empowerment) in order to promote sustainability;

F

(D) Providing technical assistance to ensure the success of pilot projects to demonstrate the utilization viability of various energy technologies, including clean coal technologies and renewable energy in rural communities and in the residential and industrial sectors;

(E) Promoting private investments in energy projects and fostering the establishment of financing mechanisms that may enable end-users to purchase energy systems to foster entrepreneurship and to assist private entrepreneurs to build successful enterprises as part of the national energy program of the Participants;

(F) Providing for the exchange of scientific, technical, and energy market information and results and methods of research and development as mutually agreed by the Participants; and

(G) Encouraging efforts to foster the roles of previously disenfranchised individuals in the Republic of South Africa, including women, in the energy and environmental fields.

2. The Office of International Energy Policy of the United States Department of Energy and Chief Energy Directorate of the Department of Mineral and Energy Affairs of the Republic of South Africa jointly will coordinate the cooperative activities contemplated by this Joint Statement of Intent.

3. All costs associated with the cooperation contemplated herein, including payment of salaries, travel and subsistence expenses of personnel under exchanges, will be borne by the Participant that incurs them, unless otherwise determined by the Participants.

Signed, in duplicate, at Pretoria, Republic of South Africa, this 25th day of August, 1995.

FOR THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA:

HAZEL R. O'LEARY
SECRETARY OF ENERGY

FOR THE DEPARTMENT OF MINERAL AND ENERGY AFFAIRS OF THE REPUBLIC OF SOUTH AFRICA:

ROELOF FREDERIK BOTHA
MINISTER OF MINERAL AND ENERGY AFFAIRS

SOUTH AFRICA SIGNINGS ANNOUNCEMENTS AND INITIATIVES

GOVERNMENT-TO-GOVERNMENT AGREEMENTS

South Africa Partner	U.S. Partner	Type of Document to be Signed	Project Description	Benefits
Department of Minerals and Energy Affairs (DMEA)	Department of Energy	Terms of Reference	Formalize Official Energy Committee for the Binational Commission	The committee will promote closer coordination on energy issues with Mbeki-Gore Commission.
Republic of South Africa	Department of Energy	Agreement for Cooperation in the Peaceful Uses of Nuclear Energy	The terms of this government-to-government agreement transcends an earlier agreement predating radification of the Nuclear Non-proliferation treaty. The new agreement provides for the required non-proliferation safeguards and will permit the US to go forward with peaceful nuclear programs with South Africa.	Improvement of old agreement - promotes improved cooperation between US and RSA on important nuclear issues.
Department of Minerals and Energy Affairs (DMEA)	DOE	Statement of Intent to establish framework for cooperative relationship between DOE and DMEA.	Establishes a framework to facilitate energy policy.	This agreement will facilitate closer government-to-government coordination on energy policy. It is anticipated that this framework will create opportunities for US and South African industry as energy technology projects are undertaken.

South Africa Partner	U.S. Partner	Type of Document to be Signed	Project Description	Benefits
Department of Minerals and Energy Affairs (DMEA)	Energy Information Administration (DOE)	Statement of Intent to share energy information.	Data sharing arrangement to improve understanding of trends in energy markets.	Improved data will lead to the development of better energy policies. EIA has also agreed to the exchange of personnel to be trained on energy information collection.

SOUTH AFRICA SIGNINGS, ANNOUNCEMENTS AND INITIATIVES

EDUCATION AND EMPOWERMENT

#

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
I Can Foundation	Department of Energy, USAID and African Electrification Foundation	Announcement of Book and Computer donation	Donation of 5,000 pounds of books and 50 computers equipped with Wordperfect systems. Donations to Guguleto and Soweto townships and the Technikon of Northern Transvaal were made during the week of the Trade Mission.	Much needed books for schools and libraries. Students will now have access to basic essentials for learning. Students will become computer literate.
ESKOM	African Electrification Foundation, and US laboratories	Announcement to kick off Science and Technology Empowerment Program`	Teachers are trained to instruct students in science and math. Program to include 15 teachers spending a summer in a science research program at one of the DOE national labs. 50 South African students are identified to participate in science and technology training at DOE national labs.	Improved education and encouragement into science based careers. Students are also exposed to science and technology training which will increase opportunity for jobs.

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
ESKOM	African Electrification Foundation and US Energy Industry.	Announcement of opportunities for South African professionals to enter established training programs in technical and management areas in the United States and in South Africa.	50 South African professionals to participate in existing training programs and internships with US companies and businesses.	Provides direct on the job training to professionals and provides students internships and visitations giving them hands-on experience in the market place.
Technikon of Northern Transvaal	Department of Energy, and African Electrification Foundation	Memorandum of Understanding will be signed to establish an HBU Energy/Environmental Development Educational Program	Three South African students will be offered full 4-year scholarships to attend four-year universities and earn bachelors' degrees in energy, environmental and science related fields. Two South African professors will be offered full 2-yr scholarships to attend US universities and earn master's degrees in science and energy related fields.	This program will allow the Technikon to cultivate leaders in science and energy related fields in South Africa. Professors with higher levels of education in turn will raise the educational attainment of their students as well as serve as role models for their communities.

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
Peninsula Technikon	Renewable Energy for African Development (REFAD), DOE	Letter of Intent to establish a five year training program.	Training center established to train technical educators, assist in curriculum development for renewable energy technology education. 20 Students to be involved in program	Develop South African renewable energy technicians, opens the door to multi-million dollar photovoltaic market.
Portfolio Business Holdings, LTD.	The Mitchell Group working in conjunction with Oak Ridge National Laboratory.	Announcement of scholarship certificates for 15 South African business owners to participate in Oak Ridge Manufacturing Technology Institute	This program provides training for business owners in agile manufacturing and industrial efficiency through computer training at the Oak Ridge program.	South African machine tool manufacturers will acquire the know-how to apply advanced computer techniques to produce precision, quality parts economically while reducing pollution and energy use. Parts produced will be used to help establish or revolutionize the South African high tech and materials processing industries.

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
Council for Scientific and Industrial Research	National Renewable Energy Laboratory and Sandia National Laboratory	Letter of Intent to create lab-to-lab cooperative agreements for research and scientific exchange on sustainable energy.	This letter will facilitate joint activities related to sustainable energy technologies. These activities will include human resource training, institutional infrastructure for sustainable energy technologies and technical assistance to ensure success of pilot projects demonstrating the viability of the technology option in rural areas.	S. African renewable market expected to be large, allowing great development of such technologies. 5-7 South Africans will be involved in this program.

SOUTH AFRICA SIGNINGS, ANNOUNCEMENTS AND INITIATIVE

POLICY DEVELOPMENT AND INVESTMENT

I

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
SUNCORPS	SPIRE Corporation and ASE Corporation	Letter of agreement to build a photovoltaic manufacturing facility adjacent to Alexandra township	This manufacturing facility will produce 500 kw/yr; electrify 10,000 homes, 600 clinics and 1,000 schools. Fast track pilot project	This project will bring 200 jobs associated with manufacturing, sales, maintainance and installation of the products made at this facility. 15-30 jobs in US to support South African partner.
Lebowa Tribe Minerals Trust	Advanced Resources International	Letter of intent to evaluate potential Market for coal bed methane	Evaluation of potential market for coal-bed methane supply and utilization.	Program is designed to create utility partnerships and train people in coal plant operations, power system planning and design and other areas of management.

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
Township of Guguletu	Sandia Laboratory, private sector companies; Historically Black Colleges and Universities and the African Electrification Foundation	Memorandum of Understanding	Sandia Labs will develop a plan to bring an enterprise zone to the Township of Guguletu. This is an effort to incorporate the Township's strategic plan which seeks to transform itself into a suburb through the development of an economic infrastructure.	This plan will incorporate the idea of creating an enterprise zone with vocational training that will draw investors and create approximately 1,000 new jobs. The design will combine facility and manpower requirements that will form the basis of Guguletu vocational training programs. Types of industry considered for this zone include brick manufacturing, textiles, electronic controls, lumber mill work.
REFSA (Renewable Energy for Southern Africa)	USAID(Agency for International Development)	Letter of agreement to install PV pilot systems in 2500 homes	This pilot project will serve 2,500 homes and can open doors to broader electrication. Pilot program will evaluate financing, installation and suport mechanisms.	Potential access increasing market for rural electricfication

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
ESKOM	EPRI	Establishment of an ESKOM/EPRI center for Essential Community Services	The center will act as a technology transfer mechanism for moving EPRI technology through ESKOM into Sub-Saharan Africa. The Center's work will also include project management, closely coordinated with government objectives initially focused on water purification, health care and the role of electricity in these efforts.	This community training center is expected to serve between 5,000 to 50,000 people.
The Group for Environmental Monitoring (GEM)	International Institute for Energy Conservation (IIEC)	Letter of Intent to conduct needs assesment for transportation sector.	IIEC will perform a joint study with GEM to determine opportunities in South Africa for Electric vehicles and manufacturing of component parts as well as opportunities for burning of ethanol from biomass.	The study results in opportunities for joint ventures in deployment of alternative fuels and vehicles in South Africa, thereby diversifying their energy base and establishing the infrastructure for more environmentally benign transportation options.
ESKOM	Johnson Controls	Contract for Energy management and other services	Johnson Controls will contract with ESKOM to install with an energy efficient building management systems	This demonstrations will provide the knowledge to South Africans to understand the economic benefits of investing in energy efficiency.

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
Republic of South Africa National Electricity Regulator	Department of Energy	Agreement to conduct two workshops on development of regulatory policies necessary to attract investment. One workshop each in United States and Republic South Africa.	Announcement as part of the Binational Commission workplan	This program will assist South Africa in developing a regulatory system. It will also facilitate investment in electric power sector.
Provincial Government of Northern Cape	Department of Energy	Joint Statement of Intent on Renewable Technologies	This statement would create a cooperative relationship to promote increased economic interaction, facilitate technology transfer and accelerate commercialization of renewable energy based systems.	This agreement will help increase the level of energy policy expertise, encourage education and investment through technical personnel exchanges and seminars and promote private investment in energy projects.
Manong Construction, Mouke Industries	PEER Consultants, Advanced Panel Manufacturers	Community Development Project in Kimberly	This project is designed to evaluate and test holistic community development assumptions and should result in the development of an approach to community palnning and development which can be replicated in other communities.	This project will involve the community in the design of the project, and will offer training and skill building opportunities. This project conforms with the goals of the Reconstruction Development Programme outlined by the South African Government.

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
Sasol I and Sasol II and other South African government agencies	Fluor South African and other US companies, government and universitites	Training program Announcement	This program will be focused to meet the goals of the Reconstruction and Development Program with particular emphasis on providing electricity to township and rural areas without electric service	Fluor South Africa owns and operates a training center in Secunda, site of Sasol I and II. Over 10,000 craft and craft supervisors have been trained at this facility. This new program is being initiated to train at lower skill levels, people to building their own low-cost homes. Fluor South Africa will transport the trainees from their homes to the training center and back to their homes. The Secunda training center has the capacity for up to 200 people in the classroom and practical areas. Formal details will be concluded for the Mbeki-Gore Summit.

South African Partner	US Partner	Type of Document to be Signed	Project Description	Benefits
Wagner Systems Pty.	Atlantic-Pacific Technologies, Inc.	Letter of Intent	This project will develop a joint venture between the two companies take the principals outlined in the Reconstruction and Development Programme and implement them by providing jobs and the resources to develop energy sources in South Africa. The letter of intent announces the development of a manufacturing plant for Renewable Energy Hybrid Systems.	This project is participating with a majority owned business to develop this project and will create equal employment opportunities in South Africa in the terms outlined in the RDP.

POD REPORTS

Each POD identified specific findings and suggested follow-up actions to improve the climate for U.S. and South Africa cooperation in its area. The POD activities and these follow-up actions are summarized below. The Environment POD issues are cross-cutting and are addressed in each report.

CAPACITY BUILDING

Opportunities for Cooperation

The most significant challenge facing South Africa today is building the human resource capacity of the black majority.

The challenge of transition is well recognized by both the South African government and others in positions of economic power, and resolving it will provide hope for the country. An economically empowered black majority will result in improved productivity, more accountability, people taking responsibility for their futures, reduced crime and violence, better government and better lives for all South Africans. Success in this endeavor will also create a model of positive change for the entire African continent.

Although some principles of our strategy have emerged during this mission, a comprehensive plan on the United States' role needs development. Here are some preliminary guidelines:

- **We will be biased toward tangible action and results** - we will take action and measure results while simultaneously defining an overall strategy; ours is not a policy development or process initiative where we will be convening meetings and conferences simply for the sake of communication.

- **We will create partnerships of learning with South Africans-** our efforts will not be successful if our actions imply the image of successful Americans telling South Africans what to do; ours must be a dialogue of mutual learning, not a monologue of us telling them. We have much to learn from this forward-moving nation, that strives to advance its civilization without reprisals or recrimination, despite its terrible history.

- **We will serve needs identified by South Africans** -- we will focus our efforts not on what we define as important, but on what our South African colleagues deem critical. We will seek South African's input proactively and aggressively to find how best we can mobilize our resources.

South Africa has eight historically disadvantaged Technikons and five historically disadvantaged universities. Of these disadvantaged universities and Technikons, the South African Black Universities and Technikons are the most disadvantaged. There are very few South African Black PhD's and MS degree faculty members. Hardly any Black faculty members in the sciences, mathematics, and technical areas, including engineering.

J.

Consequently, there is a great need to increase the mathematics, scientific, and technical SA Black personnel at the tertiary level.

During Apartheid, Black South Africans (BSA) were not allowed to study science and math at the elementary and secondary levels. Consequently, there are very few BSA math and science teachers and very few BSA students prepared to undertake the study of math, science and engineering.

Programs will have to be developed to produce math and science teachers, as well as to prepare BSA students at the pre-college level to undertake the study of math, science, and engineering.

Because there are very few BSA who are well versed in math, science, and engineering fields, very few are found in the technical areas of the SA economy and in particular, the energy related areas. In order to increase the BSA in energy-related areas, special efforts will have to be devised for BSA, to provide experience and knowledge in all facets of energy-related activities.

Concerns

The challenges set forth are daunting in many ways:

1. literacy is at a very low level
2. very few blacks enjoy positions of significant economic power
3. ownership of the vast majority of natural resources, economic assets, and corporations is held very tightly by the white minority; in fact a small subset of whites control the nation's wealth, and
4. whites also dominate the management of all major state owned enterprises and most major private and publicly traded firms.

This challenge may be daunting, but it is not impossible to address, since building human resource capacity is a matter of learning and doing.

Accomplishments

In light of these principals we have established a number of important initiatives to get into action. These initiatives should be considered the sparks of a future we are committed to creating. These initiatives are not the whole story, more needs to be done, more of our resources need to be mobilized, more leaders need to become committed, and our strategy needs to be developed.

We will be addressing both institutional as well as individual needs. We have committed to a number of specific initiatives that can organized by the type of individual they are geared towards. Specific accomplishments include:

- The Department, AEF and utility companies agreeing to train 50 (20 professors & 30

students) South African engineers and scientist, and create utility partnerships.

- The Department along with Martin Marietta Energy Systems agreement to provide 15 South African manufacturing business owners the opportunity to participate in the Oak Ridge Manufacturing Technology Institute.

- Establishment of the science and technology empowerment program to train 15 teachers and 50 students at DOE laboratories and HBCUs

- Agreement to initiate the Student/Professor Exchange program with the Technikon of Northern Transvaal which will allow 2 professors to come to the U.S. and attend an HBCU to receive their masters degree; and 3 students who would attend an HBCU and receive their bachelors degree.

- REFAD is sponsoring a 5-year training program for Renewable Energy Technology with the Peninsula Technikon, which would involve 20 students and dozens of educators.

- Sandia and AEF are sponsoring a trade school with apprenticeships.

- Provided 6,000 pounds of books and 50 computers to South Africans.

Commitments and Recommendations

In addition to the above accomplishments, DOE will be taking the lead to identify further specific opportunities to match US companies and institutions with South African needs. This will be a proactive program completed by December, 1995 where we will:

- identify RSA firms and institutions identifying their specific needs

- reach out to senior leaders at 500 US firms and institutions to create specific appropriate outreach programs

- establish direct linkages between firms and institutions, DOE will only have a monitoring/cheerleading role in these activities

- initiate a Capacity Building program for the Northern Cape will include:
  - Mining technology
  - Math and science teacher training
  - Providing renewable energy pilot programs in solar, wind and bio-gas to serve rural communities
  - Providing funding for a strategic economic development plan which can drive future activities to develop the Province's industrial and commercial base, thus reducing the current 65% unemployment rate and provide the revenues to support

rural water and electrification development after consultation with local authorities

- hold training workshops will be held in South Africa by U.S. experts for different aspects of education and training, and will involve hundreds of South Africans and

- bring to South Africa a review of experience in private and public sector organization models in a attempt to learn based on U.S. experience with discrimination

Also DOE will work with others to establish the overall strategy as well as programs to address the institutional barriers including: funding, ownership restructuring and others.

ELECTRICITY

Opportunities for Cooperation

At present only about 40 percent of the population of the Republic of South Africa have electric service in their homes, and large areas of the country are not electrified. A key element in the present government's Reconstruction and Development Program is to establish a swift and sustainable electrification program. The goal of the electrification effort will be to provide electric service to 72 percent of households by the year 2000, and to give high priority to electrification of schools and clinics.

The electrification program is expected to cost about twelve billion rand through the year 2000 ($3.3 billion, or $550 billion/year). Financing for the program is expected to be generated from within the electricity sector, perhaps through cross-subsidies from other electricity consumers. The existing electricity distribution sector is highly fragmented, the reliability and quality of service varies widely among localities, and there is no consistent system for setting retail electricity rates. Reorganization and professionalization of the distribution sector are high priorities because of their close linkages to the electrification program.

Additional efforts are needed to formalize South Africa's institutions for governance in the energy sector. Although an agency known as the National Electricity Regulator was created recently important questions need resolution concerning the Regulator's overall role--such as the Regulator's sources of policy guidance (e.g., statute, advisory bodies), whether the Regulator is to respond to policy direction from the Minister of Mineral and Energy Affairs, and whether provincial or local government entities will have regulatory responsibilities in the electricity sector.

Many parts of South Africa's electricity infrastructure need assistance in strengthening the capabilities of their staff, through training in regulatory procedure and economics, integrated resource planning, power pool design and operations, domestic energy efficiency and demandside management for the house hold sector as a whole, and the economics of resource development.
South Africa's bulk power supply system is dominated by ESKOM, a government corporation that owns and operates virtually all of the country's generation and transmission facilities. Many parties have expressed interest in introducing competition into South Africa's generation sector, but no procedure or timetable has been set. A South African Power Pool has been approved in concept, but is not yet operational. Officials from the South African government and ESKOM are also very interested in the eventual establishment of an international transmission grid across the Southern African region that would benefit all parties through more efficient use of generation resources.

Concerns

- The South African government's top priority in the electricity sector is to move forward swiftly with the electrification program, both to improve living standards directly and to

support economic expansion. Electrification of rural areas is considered especially important in order to help stem the migration of rural job-seekers into urban areas.

- The electricity distribution sector needs to be restructured and professionalized in order to support the electrification program and deliver reliable, high-quality electric services.

- The institutions and procedures for electricity governance need to be clarified.

- Mechanisms for financing the electrification program need to be agreed upon. Rural electrification presents special challenges and may have to be financed separately from urban electrification programs.

- Seminars, workshops, and internships are needed to aid all parts of South Africa's electricity infrastructure in strengthening the capabilities of their staff.

- Many companies from the U.S. and elsewhere that are active in international electricity-related businesses regard South Africa (and Southern Africa generally) as a promising long-term market. Accordingly, they would like to have some clarification on the prospects for privatization of some of ESKOM's assets, and on possible opportunities for the development of non-ESKOM generation or transmission facilities.

- Institutional mechanisms are needed in South Africa to promote greater efficiency of electricity usage, and to stimulate and guide the development and implementation of new technologies in the electricity sector. South Africa's abundant coal and solar resources and scarce water supplies along with its regional natural gas and coal bed methane potential create special needs and opportunities in the area of technology development and deployment.

Accomplishments

The Mission resulted in mutual agreement on the following actions to address South Africa's concerns and needs in the electricity sector and to aid U.S. companies in exploring opportunities to participate in South Africa's expanding electricity market:

* A series of seminars, workshops, and internships to share U.S. experience on a wide range of electric regulatory and policy issues.

* A Seminar on Power Pooling in Southern Africa, focusing electrical power alternative resource selection, and integrated power pool operations and management.

* Integrated household energy delivery Joint pilot projects to demonstrate three models (shack settlement, shack settlement upgrade, and greenfield housing settlement) of electrification, housing, and urban fuels (e.g. low smoke fuels) for South Africa.

* A low-smoke fuels (fuels which are used in South African homes synergistically with electricity) workshop to investigate substitutes for high polluting fuels with environmental superior fuels in conjunction with appropriate clean coal combustion technology.

ENERGY EFFICIENCY

Background

Coal forms the base of the energy sector comprising over 80 percent of the primary energy needs. By international standards energy prices are low. About 95 percent of the electrical energy is generated from coal. Almost all electricity is produced by state-owned ESKOM with a capacity of almost 40,000 MW. ESKOM's capacity exceeds requirements by about 25 percent.

In 1991, industry (44%) and mining (8%) accounted for more than half of the energy consumption; transportation (24%), domestic (19%), commerce (5%), and agriculture (4%) account for the remainder. Base metals, with a large steel and ferro-alloy component, consume 44% of the industrial energy; other significant components are: food (14%), non-metals (13%), paper (10%), chemicals (9%), and textiles and clothing (3%).

The mining industry consumes 82% of its energy in the form of electricity (mostly motors) equivalent to 24% of ESKOM's output; gold mining is the dominant energy consumer.

The domestic area uses about 19% of total consumption, 60% of which comes from non-commercial sources. Much of the housing is energy inefficient, especially the component constructed of corrugated iron. The Reconstruction and Development Program (RAP) aims to support the building of 1 million new homes over the next five years.

Energy intensity (energy use per unit of economic output) is high according to 1990 World Development report; a survey of 111 countries indicated that only ten countries have higher industrial primary energy intensities than South Africa. The reasons for this are several fold and include (1) the infrastructure of the economy with its large primary industry component; (2) the use of coal for production of electricity and liquid fuels, both of which are relatively inefficient; and (3) energy efficiency is not a priority in South Africa.

Process

In order to gain an understanding of the energy efficiency issues in South Africa, the U.S. energy efficiency delegates held a series of meetings with representatives of the energy intensive industries. U.S. representatives met with Sappi, the largest fine paper producer in the world, with the Chamber of Mines to discuss mining with emphasis on gold and with the Steel and Engineering Industries Federation (SEIFSA) to discuss energy usage in the steel, aluminum and ferro-alloy industries; meetings were also held with the South African breakout session counterparts prior to the Energy Summit on held in Johannesburg on August 23, 1995.

The energy efficiency breakout session of the Energy Summit, a group of 30 to 40 people first heard prepared presentations from the South African and American sides followed by a period of discussion on issues prepared by the South African Co-Chair Professor Dutkiewicz. After lunch the group broke up into four groups covering the following sectorial areas - buildings, transportation, small and medium industrial businesses and large industrial businesses. Each

group was charged with formulating barriers to energy efficiency and the action steps needed to overcome those barriers. Each group then reported back with the lead in each case being taken by S.A. A summary of these barriers and action items was then formulated.

Accomplishments

At the Energy Summit, barriers to energy efficiency and the action items need to overcome these barriers were identified:

Barriers to Energy Efficiency: lack of a long term policy and commitment; lack of a general understanding and awareness of energy efficiency benefits; skill shortage from technicians to energy efficient engineers; absence of standards and labeling for industrial equipment and appliances; a complicated tariff structure; a low cost of energy production; high cost of capital; a tax structure that favors energy inefficiency; and the fact that environmental factors are not internalized.

Recommended Actions: open a dialogue within all sectors of South Africa on energy efficiency that would result in development of an energy policy that includes development of an appropriate structure to implement that policy; develop and implement integrated energy planning; build capacity by educating and training the general public in both energy conservation and energy efficiency starting with school children in grades 1 and 2; develop financial stimuli that include access to foreign capital at acceptable interest rates, energy tariff structures that are simple without multiple players and a tax policy that includes incentives and the absence of disincentives; and lastly formulate implement standards, codes and labels.

Based on discussion of these recommendations at the Energy Summit and at the Energy Policy Roundtable, two energy efficiency priorities were identified:

- Establishment of an Energy Efficiency Center.
- Establishment of Energy Efficiency Policy and Regulation.

Agreement to establish US/SA teams in the transportation, buildings, medium and small industry segment, and large industry segment to address action items identified.

In Summary, the major accomplishment is that energy efficiency is now a high priority area in South Africa.

Deals and Agreements Signed

Five agreements and deals were signed that support the goals of the mission and augment the conclusions reached:

- Letter of Intent between the International Institute for Energy Conservation and the Group for Environmental Monitoring to conduct a needs assessment for electric vehicles, including manufacture of the component parts, and opportunities for the production of ethanol from biomass.

- Contract between Johnson Controls and ESKOM to install energy efficiency building management and other systems.

- Technology Transfer Agreement between Superconductivity, Inc and ESKOM to transfer superconductivity technology to the electrification of rural homes.

- Community Development Project between the Housing Development Corporation of South Africa and Grassroots Technology Associates to construct energy efficient houses in South Africa.

- Sustainable Development Resource Center for South Africa sponsored by Department of Energy, USAID and the World Wildlife Fund to demonstrate job creation in South Africa without damaging the environment.

Milestones

Establishment of an Energy Efficiency Center:
- decision on energy efficiency center (SA)
- 30 days after SA decision, prepare preliminary technology transfer plan (Swink/Salmon-Cox working with SA)
- 60 days after SA decision, complete plan review by interested stakeholders (SA and Swink/Salmon-Cox)
- 90 days after SA decision, issue final technology transfer plan and begin implementation (SA and Swink/Salmon-Cox)

Establishment of Energy Efficiency Policy and Regulation:
- December 1995; following the DOE comments on the "Green Paper",and outcomes of the SA Energy Summit to be held in November, prepare a draft plan for a series of workshops, seminars and internships (Swink/Salmon-Cox working with SA)
- January 1996; complete plan review by interested stakeholders (SA and Swink/Salmon-Cox)
- February 1996; issue final plan and begin implementation

Agreement to establish US/SA teams in the transportation, buildings, medium and small industry segment, and large industry segment to address action items identified in the Energy Summit Breakout Session:
- October 24, 1995; Establish public and private US/SA teams with identified team leaders to address identified action items in each of the above four areas; establish US/SA coordinating committee to oversee these activities (SA and Swink/Salmon-Cox)
- November 17, 1995; complete action plan development (Us and SA teams)
- December 4, 1995: complete coordinating committee review; establish priorities and begin implementation

FINANCE

Opportunities for Cooperation

South Africa needs foreign capital to expand the economy, increase employment, and raise living standards. International sanctions and the domestic policies of the Apartheid regime stifled both foreign investment and trade. The Government of National Unity (GNU), led by the African National Congress, has indicated a strong desire to attract foreign investment. However, the process of liberalizing the South African economy is still in the early stages.

Portfolio investments in South African companies have been fairly strong, but lingering doubts about labor costs, political stability, and competitiveness in a more open international market setting has made foreign investors wary of committing more resources. Direct investment has not met expectations, however. Although investors generally recognize South Africa as a long-term strategic market, concerns regarding the overall political situation, the near-term growth potential and remaining exchange controls, have limited direct investment from U.S. sources.

Finance and investment issues in the South African energy sector are imbedded in a host of other policy issues including evolving regulatory structures, privatization decisions, implementation of the Reconstruction and Development Plan (RDP), regional energy trade, and environmental rules. The uncertainty surrounding the resolution of other issues has impaired the attractiveness of direct investment.

The Clinton Administration Mission provided the U.S. financial community with an opportunity to conduct a dialogue with senior government officials as well as representatives of the South African business and financial communities.

Concerns

- A host of policy decisions need to be made for South Africa's energy sector before potential investors can effectively gauge the prospects for risks and returns. For example, the prospects for international investment in the electrification initiative will not be known until the eventual industry structure and the role of the National Electricity Regulator are firmly established.

- Remaining exchange controls that restrict the ability of foreign investors to access South African debt financing limits the ability of potential investors to structure mutually beneficial investment packages. These controls impair the flow of needed capital into the South African energy sector.

- Relatively high tax rates on earned income reduces investor interest in South Africa.

- Liberalization of banking regulations has only recently made it possible for U.S. commercial and investment banks to establish effective branches in South Africa.

- The tightly interlocked ownership of conglomerates that dominate the Johannesburg Stock Exchange makes it difficult for foreign investors to link up with South African partners for joint ventures and other business arrangements.

Accomplishments

- The Financial Roundtable held on Thursday August 24, offered a unique forum to exchange views regarding appropriate policy to help attract foreign investment. Representatives from a variety of segments of the South African investment and energy business community, as well as the government, discussed the barriers and opportunities for foreign investment.

  Some of the issues discussed include:

  - The role of credit enhancement as a way to increase investment in sub-national and parastatal entities was explored.

  - The Ministry of Finance indicated its strong regard for fiscal discipline and indicated that they were unlikely to support infrastructure investment through financial incentives or subsidies.

  - Methods of educating U.S. institutional investors on the strong economic prospects for South Africa were discussed, and participants agreed that despite many overtures from investment institutions, U.S. investors remain unaware of the potential of the country and the region. General lack of familiarity with South Africa was a by-product of the sanctions era.

  - Issues of public sector restructuring, privatization, and the overall role of the government in the economy need to be resolved, but resolution will take into account many factors, such as employment and empowerment, and the resulting outcomes may not be optimal from a foreign investment perspective.

  - European and Asian investors are more aggressive now and are less concerned about policy issues. South African government needs to put projects on the table for international investors to evaluate, instead of considering these issues in the abstract.

  - Private sector investors have criteria by which they assess relative opportunities among different emerging markets. They examine a matrix of issues that include: tariff structure, tax regime, convertability of currency, repatriation of profits, development of domestic capital markets to increase available funds, regulatory environment of certainty and stability, legal system, available guarantees, allowed returns, future liquidity of investment, history of market path, and creditworthiness of offtakers.

- There is no shortage of capital for energy projects per see: there are too few really good projects are out there. South Africa has to develop policies that attract foreign investors. For example, rural electrification projects can attract capital if they are developed by a creditworthy entity.

- The perspectives of U.S. financial interests were offered by selected members of the finance pod during the meetings with the Deputy President DeKlerk, Energy Committee of Parliament, ESKOM, bilaterals with Minister Botha, Minister Sigcau, and Minister Manuel.

Commitments and Recommendations

- The business delegation urged South African government to further ease exchange controls as a way to encourage foreign direct investment in the South African energy sector, and to create a more favorable climate for foreign investors.

- The U.S. government should facilitate the continuing education of U.S. institutional investors to gain understanding of the South African market.

- Ongoing policy dialogue between the Department and the South African government should include the perspectives of the U.S. financial community.

- The Administration should coordinate the activities of the various agencies involved with U.S.-South African investment and trade to promote a more unified approach on behalf of the business community.

OIL AND GAS

Opportunities for Cooperation

The most significant issue in the South African liquid fuels market involves the manufacture of synthetic fuels. Synthetic fuels made from coal and gas have been a strategic priority for past South African governments and provide a substantial percentage of liquid fuels consumed in South Africa. The main components of the liquid fuels industry, crude oil refining and synthetic fuel production, account for about 35 percent of commercial energy consumption. As South Africa makes its transition to a more open, market-based economy, it seeks to further bolster its domestic oil and gas supply capacity and reserve base by attracting U.S. (and other western) petroleum companies to invest in both onshore and offshore exploration and development projects.

Two issues are of particular importance with respect to the South African natural gas market. The first is whether or not this potential market exists. Current gas production accounts for only one percent of the final energy used. The presence of large fields in neighboring countries, and significant domestic production potential using coal-bed methane, could provide significant gas supplies should a future demand be generated. The second issue is related to the demand issue: there is no national gas policy, law, infrastructure or regulation. The lack of regulation has not been a significant issue in an environment of low gas utilization. It becomes important if there are plans to expand this system and introduce long-term gas transmission.

South African ministerial organizations and companies including the Department for Mineral and Energy Affairs (DMEA), Sasol, Soekor, Eskom, and CEF participated in discussions with U.S. government and industry participants resulting in the exchange of significant information and agreement to structure continued cooperative activities.

Concerns

- A perceived oil and gas reserve base.
- A clear and concise analysis of the reserve base for natural gas needs to be developed in the near future. This would allow companies to make sound investment decisions and possibly expand or help to develop a natural gas market.
- Exploration and Production terms: Incentives are needed to let South Africa compete with other countries seeking investment capital. The terms allowed for exploration and production in South Africa must be flexible enough to allow companies to compete on a worldwide portfolio basis, since the field size may be smaller than average.
- Lack of a natural gas market is perceived. Since Eskom has perceived an over-abundance of electricity, there is no perceived market for natural gas. This is not essentially true.

N

- Involvement of independent power producers regarding baseload and cycle time/ decisions have been clarified. Independent power generation has few restrictions, but licensing must be obtained. The cost of coal is distorted, along with Eskom's over-abundance issue, and this distorts the competitiveness of independent power generation from natural gas. Millions of households, however, need electricity.

- Calculation of the full cost of generating future energy is inexact; coal based power is burdened with environmental costs, and high costs infrastructure costs versus natural gas. The exclusion of environmental costs for the use of coal creates the price disparity between the two fuels.

- Opportunities exist in markets for natural gas. There are markets for natural gas that are competitive when thermal heating is considered:

  (1) Mineral beneficiation/mining
  (2) Industrial/electrical utility
  (3) Domestic use: Propane, Butane, Fuel Cells, Fertilizer

  There is a great need for natural gas when the rural and smaller areas are evaluated on a need basis. The full costs of thermal generation is much more competitive on this basis. Coal-bed methane (CBM) is definitely a vast resource and can be widely exploited in the future. One of the limiting variables of CBM is the ownership issue. Questions to considered include: How can the rights of CBM be actually allocated? Ownership issues; who owns? Is the title vested with someone else? Is the ownership concept a good one for the production and development of such resources?

- Incentives are needed by South Africa for both domestic and foreign investment to attract and retain business; for example, equal treatment of companies in the market place. The parastatal companies have a unique advantage in the market-place when protectionist policies are considered. All protection and subsidies should be phased out and companies should be allowed to operate on a free-flowing, competitive basis. Foreign investors are not willing to invest in new projects with the subsidy issue unresolved.

- Government incentives to stimulate black empowerment is required in U.S. and South Africa. The future of South Africa relies on the fact that black South Africans will be brought into the mainstream. This will boost the economy, make government more stable, and create needed jobs in the black communities. This makes training on-the-job experience or formal education in petroleum areas desirable.

- The full impact of undefined environmental emissions is being analyzed. The nature of future regulations make it difficult for anyone to make rational investment decisions; i.e. cost for clean-up: SOx, CO2, NOx, and particulate matter.

  The cost of environmental cleanup and/or prevention is large. Many areas in South

Africa already have air pollution problems relating to coal burning or other processes. The true cost of power plants and projects in relation to coal as a fuel source is not clear. The piles of coal waste may have an opportunity for other uses. These avenues must be pursued before both water (possibly acid rain) and air pollution have reached irreversible or unwanted states.

Accomplishments

- Positive discussion and understanding on the part of the South African government on the urgency for the Republic of South Africa (RSA) government in developing a clear policy and regulatory framework to encourage new development.

- Positive discussion and understanding on the part of the bi-national commission to look at ways of resourcing this activity and building capacity in energy policy and analysis and development --e.g., by partnering appropriate institutions in the United States and the Republic of South Africa.

- A clear and concise plan for employing and empowering the vast majority of Black South Africans in the townships and other communities. There are no other means for South Africa to move forward if the concerns of the majority are not met.

- Positive discussion and understanding by the RSA of the need to blueprint an energy strategy revolving around the following themes:

  1) Reserve base definition
  2) Natural gas market analysis
  3) Generation of electric power and needs
  4) A competitive price for natural gas
  5) Full cost of environmental preservation and cleanup related to cost use
  6) Market opportunities and other uses
  7) Coal-bed methane and opportunities
  8) Incentives for oil and gas exploration and production
  9) Dispelling of perceptions about natural gas as a fuel source
  10) Employment and training of black South Africans
  11) Subsidies or protection that limit open and free competition

Commitments and Recommendations

- A project on Capacity Building in the Oil and Gas Industry to be undertaken to train South Africans, and to exchange students and personnel to be developed by June 1997. Participants to include academic institutions and the private sector.

- An analysis of Legal Constraints with regard to Coal-Bed methane development to be completed by December 1995. Participants to include DMEA, DOE and the private sector.

- A project involving the analysis of Financial Regimes - Contract Terms and Conditions to be completed by December 1995. Participants to include DOE, DMEA, Soekor, CEF, and Sasol.

- A project involving an integrated analysis of Natural Gas Resources and Markets to be completed by December 1996. Participants to include DOE, DMEA, Utilities, Electric Power Research Institute.

RENEWABLES

Opportunities for Cooperation

Significant opportunities for cooperation between the US and South Africa in the area of renewable energy technology appeared with the election of the government of national unity in April, 1994. The Reconstruction and Development Programme (RDP) authored by this government is designed to improve the quality of life of the previously disenfranchised portion of the population. Major elements of the program involve energy supplies, both electrical and otherwise, health care and education. Since much of the population is located in the rural areas far from the current and anticipated electrical grid connections, this implies an extensive use of renewable energy technologies.

To put this into perspective, the government estimates that 2000 clinics need to be electrified through photovoltaics by the end of 1996, 16,800 schools will be similarly powered by the end of the decade, and approximately 2 million homes and small businesses can only be economically electrified using renewables. This does not include the use of wind and photovoltaics in delivering potable water. The US has positioned itself to take advantage of these opportunities.

In order to facilitate these opportunities for US renewable energy technology goods and services, the Department has developed quality working relationships with relevant ministries and agencies. These include the Department of Mineral and Energy Affairs (DMEA), the Independent Development Trust (IDT), the Energy for Development Research Center (EDRC), and ESKOM, the national parastatal electrical utility.

Concerns

- Inadequate numbers of trained personnel in government required to plan and implement programs designed to reach the renewable energy-related goals of the RDP.
- Lack of a sufficiently large and robust indigenous renewable energy industry capable of addressing the RDP needs.
- Low levels of technical background among members of the majority population.
- Lack of a national program, including financial mechanisms, for sustainable rural off-grid electrification.
- Immature provincial infrastructure, implying lack of essential emphasis on regional energy issues.
- Urgent need for economic development among the majority population, and related energy requirements.
- Lack of basic commercial business skills among the majority population.

Accomplishments

- Dedicated a Renewable Energy Technology Training Center at Peninsula Technikon near Cape Town. This center was the site of a 4-week long "training the trainers" session sponsored in large part by the Department. It is expected that this center will be replicated at other technikons, thus providing the capacity building capability to facilitate renewable energy applications for the rural population.

- Formally opened a photovoltaic module manufacturing facility. The equipment for the facility was provided by the Department. The business entity, named Suncorp, was orchestrated by Renaissance, a Black empowerment venture capital group with origins in the US's Monitor Group. Suncorp will have a preferred position when it comes to supplying hardware for rural electrification projects.

- Partially electrified the Ipolokeng Primary School in the Diepkloof section of Soweto. This school had been internally wired for grid power in 1985, but never connected by the utility, ESKOM.

- Installed photovoltaic lighting to a public washing station in the Alexandra River Community, a squatter camp immediately adjacent to the Alexandra Township. The station serves more than 1000 people, and the lighting will allow usage to continue into the evening hours. This will free time for women to pursue other, likely revenue producing, activities.

- Signed a memorandum of understanding with USAID to provide $1.1M of AID resources to the REFSA pilot program. REFSA is the Department of Mineral and Energy Affairs program to electrify, in a self-supporting manner, the approximately 2 million rural homes and 100,000 business not expected to be reached by the utility grid within the next 20 years. The pilot will electrify 2400 homes and 100 businesses while prototyping the greater REFSA program.

- Signed (through the national laboratories) a statement of intent to address renewable energy technology applications in the context of the Northern Cape Province.

- Announced a study of the feasibility of developing an industrial park in the Gugulethu Township near Cape Town leading to the creation of 1000 new jobs.

- Signed (through the national laboratories) a memorandum of understanding with the IDT to initiate US involvement in rural clinic electrification.

- Signed (through the national laboratories) a memorandum of understanding with the Center for Scientific and Industrial Research (CSIR) to channel US renewable energy technologies to South African communities.

Commitments and Recommendations

- Continued support of the establishment of renewable energy training centers at South African technikons will build the infrastructure needed to apply renewable energy technologies in the rural environment at a rate consistent with the RDP. The US direct cost for this support is estimated to be $200k annually for five years to REFAD. This activity supports the goals of the Gore/Mbeki Commission.

- The success of the Black managed Suncorp needs to be maximized to the greatest extent possible. Technical consultation through the national laboratories needs to be provided as Suncorp grows through its formative stages over the next several years. This activity supports the goals of the Gore/Mbeki Commission.

- The electrification of the Ipolokeng Primary School needs to be viewed as a long-term success. Through Suncorp, assure that the project provides long-term customer satisfaction.

- The performance of the Alexandra River Community public washing area lighting needs to be viewed as a long-term success. Through Suncorp, assure that the project provides long-term customer satisfaction. This takes on added significance when one realizes that Alexandra is now a part of Sandton, one of the most affluent suburbs of Johannesburg.

- Support for REFSA is needed to carry this effort forward. Technical consultation, participation on the pilot and full projects' advisory boards, and support of NRECA participation is highly advisable. The cost of this support is estimated to be $500k per annum. This activity supports the goals of the Gore/Mbeki Commission.

- Ensure that the Rosenkrantz clinic is properly electrified in time for its dedication by President Mandela.

- Secure funding ($860K) to finance US participation in IDT's model clinic program.

- Prioritize candidate renewable energy projects suggested by the government of the Northern Cape, and subsequently implement a subset.

- Complete feasibility study for the light industrial park in Gugulethu.

RESEARCH AND DEVELOPMENT

Opportunities for Cooperation

As a result of visits to the National Accelerator Center, University of Capetown, University of Witwatersrand, North Cape Provence, and the Northern Transvaal Technikon it is clear that an opportunity exists for the Department to take a lead role in building an open system of research universities and professional technical training institutions and research laboratories that will meet the needs of the Republic of South Africa and utilize the capacity of all its citizens. Such a system must rise from primary and secondary schools that instill excitement and competence in science, engineering and mathematics. This system will serve as a broad resource for science and technology innovation for southern Africa. It will be a primary source of creating and utilizing new energy production and end-use technologies for Southern Africa.

Presently, not many Black South African students pursue training in the sciences, engineering and mathematics. It is not altogether clear exactly how many of those who are engaged in study in these areas actually graduate from the Technikons or the Universities. Additionally, very few blacks hold faculty positions in either the Historically Disadvantaged Institutions or the Historically White Institutions. A solution to this inequity must be found before improvements can be realized. Improving the number of Black South Africans with masters and doctorates in these fields will require a major effort.

The R&D Pod noted that there are many parallels to R&D programs at many of our National Laboratories and the Universities and research institutions in South Africa. In particular, many research programs appear to overlap in some important areas, such as energy efficiency in buildings and industry, materials science, power electronics, environmental sciences, and advanced computing. Officials from these South African institutions are very interested in establishing collaborative programs with the National Laboratories and Historically Black Colleges and Universities.

Concerns

- The South African government's top priority is to move forward with its electrification program. Unfortunately, this adversely impacts funding for education and research.
- Graduates of South African Universities and Technikons are lured away from obtaining advanced degrees or teaching by industry's promise of high salaries.

Long Range Goals

- Establish centers of excellence in energy-related research at traditionally black and white universities and research laboratories.

- Foster strong energy research collaborations among traditionally black and white universities and laboratories.

- Increase the number of black graduate students in energy-related science, engineering and mathematics disciplines.

- Increase the number of Bachelors degrees in science, engineering and mathematics from traditionally black universities through energy-related research experiences.

- Improve science, engineering and mathematics curricula at traditionally black universities.

- Establish high quality science and mathematics education in townships.

- Create an environment conducive to sustained excellence and open participation at traditionally white universities and research laboratories.

Accomplishments

The Mission resulted in mutual agreement that the following actions should be pursued if the goals are to be accomplished:

- Conduct research planning workshops

- Establish collaborative energy research projects and programs with DOE National Laboratories and HBCUs

- Provide for faculty and teacher research and teaching participation at DOE National Laboratories and HBCUs

- Facilitate student research participation and exchange at DOE National Laboratories and HBCUs

- Create faculty-student research teams at DOE National Laboratories and HBCUs

Milestones

Notional milestones have been establish which will result in achievement of the goals:

- October 95 - Establish US teams for each area composed of appropriate DOE program managers, National Lab scientists, and HBCU investigators;

- October 95 - Establish South Africa teams composed of appropriate participants from DMEA,CSIR,FRD, Traditionally Black Universities and Traditionally White Universities

- November 95 - Send US teams (Energy Efficiency, Computational Science, Nuclear Physics) to identify opportunities for collaborations more fully
- January 96 - Return visits to US by South Africa teams to assess opportunities and to plan workshops
- January-September 96 - Remaining US-South Africa teams undertake visits and undertake planning workshops
- June-September 96 - Initial Exchanges/ Research Participation begin
- September 96 and beyond - Full implementation begins

U.S. AMBASSADOR'S SUMMARY

Energy Secretary Hazel O' Leary was warmly received in South Africa during her August 19-26 visit to promote U.S. -South African energy cooperation and formalize the Sustainable Energy Development (SED)committee of the Gore-Mbeki Binational Commission. Secretary O'Leary's emphasis on outcomes produced an exceptional set of achievements: in township economic opportunity, renewable energy, joint research and policy review. Her success in bringing Parliament into the discussion strengthened linkages with an increasingly active institution in South Africa's new democracy. Signing the nuclear cooperation agreement, among others, signalled close U.S.- South African cooperation in the safeguarding of nuclear material and our shared commitment to non-proliferation.

Her host, Minister of Energy and Mineral Affairs Pik Botha, described the visit as a resounding success in the critical areas of energy cooperation and business development. During her visit, O'Leary discussed on-going and future opportunities for cooperative activities with President Mandela, Deputy Presidents Mbeki and De Klerk, and a wide range of senior government and business officials. The event-packed visit focused on creating private investment opportunities between Americans and South Africans; promoting discussion among parliamentarians, business and community representatives, government officials and U.S. interlocutors on energy topics, and assisting in development of appropriate policy and economic structures in South Africa.

During O'Leary's visit, DOE sponsored a one-day energy summit for over 300 South African and U.S. Government and business representatives. Break-out sessions organized by sector and technical area produced substantive recommendations for future cooperative projects among U.S. and South African participants which were adopted by the first meeting of the sustainable energy development committee of the Binational Committee on August 25.

O'Leary signed Government-to-Government Agreements on the Terms of Reference (TOR) for the SED committee of the Mbeki-Gore Binational Commission and Peaceful Uses of Nuclear Energy. She also signed two Statements of Intent covering energy policy, science and technology, development cooperation, and energy information exchange. Private sector members of the O'Leary delegation signed an additional twenty-three agreements, Memorandum of Understanding's and Letters of Intent in the areas of education and empowerment, policy development and investment initiatives. The visit demonstrated clearly the potential of the Binational Commission in developing relationships and programs of mutual benefit to both countries. The array of expertise, the can-do approach of the entire mission, and the leadership of the Secretary made a profound impact on the full complement of interlocutors.

The Washington Post
Circ: 1,132,800 AUG 26 1995

U.S. to Help S. Africa Boost Energy, Create Jobs

By Lynne Duke
Washington Post Foreign Service

A 16

PRETORIA, South Africa, Aug. 25—U.S. Energy Secretary Hazel R. O'Leary and her South African counterpart signed agreements today to bolster South Africa's energy capacity, create energy-related jobs and electrify the millions of South African homes where candles still light the night.

In what South African Mineral and Energy Affairs Minister Roelof F. Botha called a "milestone" in U.S.-South Africa relations, the two governments also agreed to cooperate in the peaceful uses of nuclear power. In addition to being ostracized for its past policies of racial oppression, South Africa long had been isolated internationally for secretly developing nuclear weapons, which it has since destroyed, and for refusing, until last year, to sign the nuclear Non-Proliferation Treaty.

Despite some recent disagreements between the two countries, especially over South Africa's decision to store Iranian oil, the Clinton administration delegation headed by O'Leary represented a strengthening of U.S.-South African ties.

The relationship is focusing far more on private sector investment than government aid. Most members of O'Leary's delegation represented corporations, investment houses, utilities foundations and universities.

The joint ventures announced today between U.S. and South African companies are expected to create nearly 2,000 jobs. The projects include a photovoltaic manufacturing plant near the Alexandra township north of Johannesburg that will, with solar power, electrify 10,000 homes, 600 clinics and 1,000 schools. The first of its solar panels was delivered this week, during O'Leary's visit, to a primary school in the township of Soweto that has no electricity. Also initiated this week was a private-sector plan to develop a light industrial park in Guguletu township, near Cape Town.

Energy had been subject to the racial whims of South Africa's white-minority rulers, who kept the quality of life for blacks far lower than for whites. As a result, the South Africa inherited by the black-led government of President Nelson Mandela provides electricity to barely half of its 8.5 million homes.

Since last year's elections, the state electric utility, Eskom, has electrified 325,000 homes. Many people still live in tiny zinc shacks, but the power poles and high-voltage wiring overhead show signs of partial progress. Still, some 4 million homes do not have power, and the slow rate of electrification—along with the snail's pace of most other quality-of-life reforms promised by Mandela—may emerge as a political liability for the new government.

Under apartheid, the manipulation of energy along racial lines extended into the field of education, where black teachers were not allowed to teach the mathematics and scientific skills required to prepare students for high-technology work. Among the beneficiaries of today's agreements will be scores of teachers and students who will receive basic U.S. training in energy-related fields.

O'Leary presided over the donation of 5,000 pounds of math and science books, collected by the U.S. group Blacks in Government, as well as 50 computers. "Things that we take for granted can so enrich the educational opportunities for these youngsters," O'Leary said.

Most South African power is fueled by coal-burning stations; there is one nuclear power station and a couple of hydroelectric plants along the Orange River. South Africa has begun looking to the Cahora Bassa Dam on the Zambezi River in Mozambique as a future source of hydroelectric power, once hundreds of power pylons connected to the dam are repaired from the damage they sustained in Mozambique's 16-year civil war, which ended two years ago.

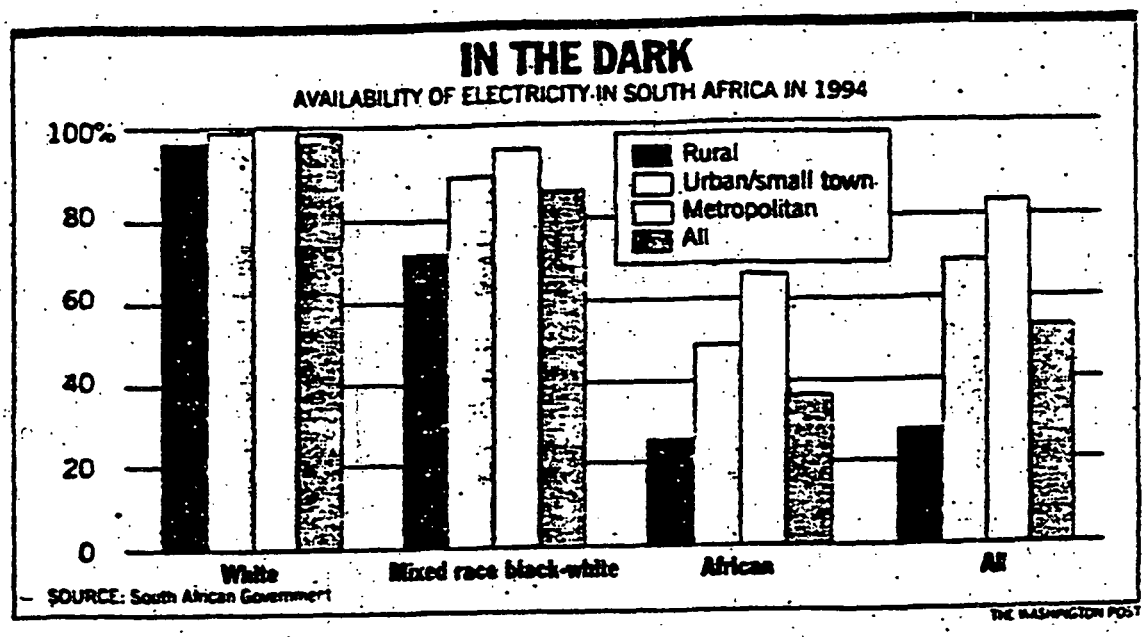
Regional power sharing will be a major topic of a Southern African Development Community summit in Johannesburg. Heads of state from the region who will meet Monday are expected to sign an agreement to seek power from as far north as the Inga Dam on the Zaire River, whose power production capacity is greater than that of all the 11 southern African countries combined.

CONTINUED

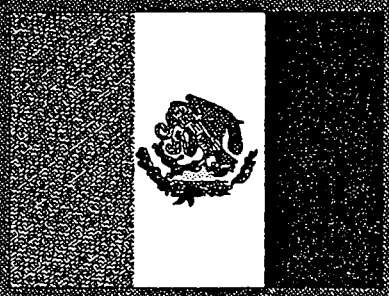
R

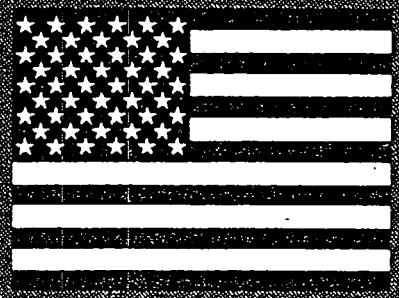
CONTINUED

The Washington Post
Circ: 1,132,800
AUG 26 1995



U.S. DEPARTMENT OF ENERGY





Led by

Deputy Secretary William H. White

June 19-22, 1995

MISSION TO MEXICO

TRIP REPORT

Mexico Trip Report

Table of Contents

		Page
o	Introduction and Overview	1
o	Findings and Conclusions	3
o	Recommendations and Next Steps	4
o	Attachments	Tabs
	-Business Agenda	A
	-Seminar Descriptions	B thru G
	-U.S. Business Delegation	H
	-Mexican Business Participants	I
	-Mexican Government Participants	J
	-U.S. Government Delegation	K
	-Press Reports	L
	-List of Acronyms	M

INTRODUCTION AND OVERVIEW

Deputy Secretary of Energy Bill White led a U.S. energy mission comprised of 117 representatives from 88 American companies to Mexico from June 18-22, 1995. U.S. Government officials who joined Bill White in the mission included the Chair of the Federal Energy Regulatory Commission, and senior representatives from the Departments of Energy and Commerce, and the U.S. Agency for International Development.

The objectives of the mission were to build new relationships among U.S. firms, Mexican private firms, and the new officials of the Zedillo Administration; to have the Mexican officials describe their vision of the future outlook for the Mexican energy sector; to understand better the new opportunities offered in specific energy sectors, and to engage in energy policy discussions that will benefit both the people of Mexico and the United States.

During the first three days of the visit, officials of the Government of Mexico and representatives from Mexican firms, totalling over 230 participants, participated in seven seminars, all of which were held in Mexico City. These seminars covered a range of topics including: energy regulatory reform; renewable energy and energy efficiency; natural gas transmission and distribution; power generation opportunities; energy project finance; and science and technology cooperation. These seminars provided an opportunity for Mexican officials, together with Mexican private industry, to share their experiences with the U.S. delegation, while exploring new opportunities for cooperation, trade and investment.

Following these seminars, a summary of each, including the recommendations and next steps developed by the seminar participants, was presented to Deputy Secretary Bill White and Mexican Under Secretary Jorge Eduardo Navarrete by U.S. and Mexican representatives. In addition to the seminars and the summary reports session, there were opportunities both at luncheons and receptions for U.S. and Mexican companies to interact and discuss possible joint business opportunities. During the luncheons, Energy Secretary Ignacio Pichardo, Under Secretary Navarrete, and the Director General of Petroleos Mexicanos (the state oil company), Adrian Lajous, were among the feature speakers. Rogelio Gasca Neri, the Director General of the Comision General de Electricidad (the state electricity company), held a special session with mission delegates to discuss that company's plans for expanding electricity generation and use. Hector Olea, Chairman of the Mexican Energy Regulatory Commission, joined by Elizabeth Moler, Chair of the U.S. Federal Energy Regulatory Commission, spoke during the Regulatory Development seminar.

In addition to the seminars and roundtable meetings, Deputy Secretary Bill White held a series of meetings with each of these senior Mexican energy officials.

The U.S. Department of Energy wishes to acknowledge with gratitude the contribution to this mission provided by the Under Secretary of Energy Policy and Development of the Energy Secretariat, and its designated officials, who jointly developed the seminar program with DOE.

On the fourth day of the mission, Deputy Secretary White led a delegation of 35 U.S. business representatives to Monterrey, the industrial and financial center of Mexico. While in Monterrey, the delegation met with members of the Monterrey business community to discuss their energy needs and possibilities for future business partnerships. In addition, Deputy Secretary White met with Socrates Rizzo, the Governor of the State of Nuevo Leon.

We would also like to thank the following law firms and companies for contributing toward the cost of several of the luncheons and receptions: Akin, Gump, Strauss, Hauer & Feld; Citibank; General Electric; Raytheon Engineers and Constructors; Skadden, Arps, Slate, Meagher & Flom; and Vinson & Elkins.

FINDINGS AND CONCLUSIONS

The objectives of the mission were achieved, and set the stage for continued dialogue between the U.S. and Mexican Governments, particularly with respect to regulatory reform and development, for continued discussions between U.S. and Mexican private sectors regarding investment and joint venture opportunities in the Mexican energy sector, and the identification of some collaborative research and development projects. The U.S. Embassy contributed greatly to the success of the mission.

The presence and participation of over 230 representatives from the Mexican Government and Mexican private firms in the seminars ensured that private sector views and comments regarding Mexican Government plans were presented under a joint U.S./Mexico private sector umbrella.

The visit of the mission to Monterrey provided the 35 U.S. companies that accompanied Deputy Secretary White a unique opportunity to learn about the near-term energy needs of the Monterrey business community and assess the market prospects for joint ventures.

Presented below is a short summary of some of the key findings. (More detailed findings and conclusions from each seminar are contained in the attachments to this report).

- The regulatory framework that Mexico develops over the next few months to regulate private investments in certain areas of its energy sector will be critical in determining the likelihood of financing allowed energy projects. Mexico must compete against other countries for the available project financing, and uncertainties or conditions that hinder the ability of investors to obtain needed financing will impede the development of these projects.

- Mexico will need to clarify the role of the state energy enterprises (PEMEX and CFE) in the newly opened energy areas.

- Mexico needs to exploit more fully the multi- and bi-lateral sources of funds available for the deployment of renewable energy and energy efficiency programs. Mexico should be more aggressive in reviewing and approving such projects.

- Opportunities exist for both short- and long-term research and development cooperation between the U.S. and Mexico, and these opportunities should be further developed and supported.

- There should be continuing collaboration between Mexico, Canada, and the U.S., on the formulation and implementation of energy policies in order to assist the development of a more integrated North American energy market.

RECOMMENDATIONS AND NEXT STEPS

Mexican Regulatory Development

- The development of Mexican energy regulations should be accomplished in a transparent manner with input and public comment from all parties, including interested U.S. parties, in order to have a regulatory structure that will promote competition and investment.

- Participants urged that in addition to the allotted time for input prior to the publication of the regulations, there be a period of time to permit public comment on the proposed regulations prior to their adoption.

- Regulatory authorities in the U.S. and Mexico (and Canada which had been included in a previous regulatory session at the University of Houston in Texas) should continue the cooperative consultation process in connection with the formulation of the energy regulations.

A more detailed description of this seminar's structure and results is presented in Tab B

Renewable Energy

- Mexico should continue and intensify resource assessment for renewable energy opportunities in the country.

- Follow-up forums should be encouraged to facilitate the identification of renewable energy opportunities and to promote the identification of joint-venture partners.

- Pre-feasibility studies are a very important initial step in the assessment and acceptance of a project, and they greatly enhance the potential for success. Participants recommended that Mexico explore the availability of funds from multi- and bi-lateral agencies and NGO's to enhance such efforts.

- Mexico should implement the sustainable growth plan of renewable energy technologies through prototype systems and other measures to provide a critical accelerating step in their commercialization.

- Mexico should consider holding a joint conference to share experiences and to fully explore and brainstorm the potential impacts of deregulation on the commercialization of renewable energy.

Energy Efficiency

- o Follow-up meetings between FIDE and CONAE and their U.S. counterparts should be held to do the following:

  - explore ways to establish contacts between U.S. companies and end-use decision makers from Mexican government, industry and the commercial sectors;

  - discuss financing terms available from U.S. companies;

  - explore assistance available from multi-lateral and bi-lateral financial organizations;

  - identify ways to increase the prominence of energy efficiency within CFE and the Mexican government at large.

- o To this end, Mexico should consider hosting meetings between U.S. utilities and officials from CFE to discuss ways in which U.S. utilities can share their experiences in this field with CFE; and meetings between CFE and Luz y Fuerza to discuss mechanisms for shared-savings between utilities and industry for applying energy efficient technologies.

- o U.S. government officials and private sector representatives are available to discuss and help Mexico develop an effective federal energy management program that will save taxpayers dollars.

- o A series of combined workshops and mini trade expositions may be a useful method of demonstrating the benefits of, and encouraging investments in, energy efficiency. As part of these workshops, participants would hope to facilitate opportunities for one-on-one meetings between vendors and potential clients.

A more detailed description of this seminar's structure and results is presented in Tabs C1 and 2

Natural Gas Transmission, Storage and Distribution

- o Mexico should publicize the process and schedule for reviewing and commenting on regulations to accompany the new natural gas infrastructure laws.

- o Mexico should hold forums or other appropriate meetings to build understanding and trust between the parties involved in infrastructure activities.

- o Participants recommended that U.S. companies be invited to participate in a process established under the auspices of a neutral entity, to create a series of targeted workshops

with specific focus areas and participants (U.S. companies, Mexican companies, PEMEX, regulators, and other government and private sector experts), designed to share information, discuss problems and areas of uncertainty, and recommend solutions (options). The outcomes from these workshops would be reported to a steering committee and to senior Mexican government authorities.

A more detailed description of this seminar's structure and results is presented in Tab D

Independent Power Generation

- U.S. companies are interested in working with CFE and the Secretariat of Energy to provide needed information to make new projects more easily financed.

- U.S. companies, DOE and FERC are available to provide formal or informal comments on draft regulations developed for Mexico's natural gas and electricity sectors.

- Follow-up workshops, focused on a narrower range of electricity and regulatory issues, that would include the appropriate combination of CFE, SE, CRE, DOE, FERC, U.S. and Mexican businesses, may be appropriate.

- U.S. utility and independent power plant companies are prepared to arrange for site visits and workshops in the U.S. for CFE, SE and other organizations regarding U.S. company activities in integrated resource planning (IRP), demand-side management (DSM), transmission and distribution planning and expansion, environmental controls, pricing, etc

- A workshop on electricity regulatory reform issues, coordinated with FERC, USAID and other entities as needed, may be appropriate.

A more detailed description of this seminar's structure and results is presented in Tab E

Project Finance, Including Joint Ventures

- Mexico is competing with other foreign countries for project financing dollars. Project developers will go where financial terms and conditions are most favorable (examples being India, Pakistan, and China.).

- Mexico should avail itself of the full resources offered by the international financial investor community (World Bank, EXIM, OPIC, IDB, etc.).

- Equity financing will be important to Mexico's ability to attract international project financing. As more banks require increased equity positions on the part of developers, developers need to be able to turn to such programs as OPIC, which provides investor equity and construction risk insurance.

- To promote cogeneration investment opportunities, Mexico should complete wheeling regulations and consider revisiting the 20 megawatt legal limitations.

- Mexico is encouraged to continue its efforts to join MIGA, and to consider joining OPIC.

- Mexico should continue to encourage industry input into the development of the natural gas regulations.

- Participants believe that Mexico should continue to develop public forum opportunities whereby U.S. and Mexican companies and government institutions can continue to exchange information, identify common barriers, and develop common solutions.

A more detailed description of this seminar's structure and results is presented in Tab F

Science and Technology as it Relates to the Energy Sector

- Both the Mexican and U.S. government agencies are interested in more closely coordinating and collaborating in applied energy R&D projects that involve the private sector of one or both countries.

- Priority areas for collaboration include natural gas and heavy oil extraction technology, clean fuels development, energy efficiency and renewable energy, energy forecasting and data transfer, environmental characterization and remediation, and pollution prevention.

- Participants from the workshop will quickly identify one or two projects with high probability for success in natural gas production or end use. They will seek support from DOE, PEMEX and industry, and will execute the projects.

- The U.S. and Mexico will hold a follow-up workshop with participation by industry, PEMEX, IMP, IIE, UNAM, DOE/FE,/EE,/PO, and /ER to develop a plan for collaborative development and demonstration projects.

A more detailed description of this seminar's structure and results is presented in Tab G

U.S. DEPARTMENT OF ENERGY MISSION TO MEXICO
Led By Deputy Secretary William H. White

BUSINESS DELEGATION AGENDA

MONDAY, JUNE 19, 1995

8:30-
9:30am Finance Seminar Coordinating Meeting
- Contact: Steve Lee Rm. 424
- Room 702

8:30-
9:30am Regulatory Seminar Coordinating Meeting
- Contact: Dave Pumphrey Rm. 518
- Room: San Luis

9:00-
10:00am Power Seminar Coordinating Meeting
- Contact: Russ Profozich Rm. 617
- Room: Guadalajara

10:00-
11:00am Natural Gas Infrastructure Seminar Coordinating Meeting
- Contact: Don Juckett Rm. 718
- Room: Guadalajara

10:00-
11:00am Science & Technology Seminar Coordinating Meeting
- Contact: Linda Trocki Rm. 334
- Room: Board Room (Business Center)

10:00-
11:00am Renewables & Energy Efficiency Seminar Coordinating Meeting
- Contacts: Peter Fox-Penner (EE) Rm. 612
  Beth Arner (Ren.) Rm. 831
- Room: San Cristobal

12:00-
1:00pm U.S. Delegation Welcome and Country Briefing
by Deputy Secretary Bill White
and U.S. Embassy Deputy Chief of Mission Charles Brayshaw
- Country Briefing by Embassy and American Chamber of Commerce
- Review of Agenda
- Room: Guadalajara

MONDAY, JUNE 19, 1995 continued

1:30-
3:00pm Formal Opening and Luncheon

Key guests:

Mexican Secretary of Energy Ignacio Pichardo
Mexican Deputy Secretary of Energy Jorge Eduardo Navarrete
U.S. Deputy Secretary of Energy Bill White
U.S. Embassy Deputy Chief of Mission Charles Brayshaw

- Room: Gran Salon A & B

3:00-
3:30pm PRESS AVAILABILITY

- Bill White, Jorge Eduardo Navarrete
Room: Gran Salon A & B

3:30-
5:30pm SEMINAR ON MEXICAN REGULATORY DEVELOPMENT

Theme: Offering interested businesses and U.S. regulatory experts an opportunity to understand the formulation of Mexican regulations on gas transmission, distribution, and storage.

Outcome: A working knowledge by both U.S. and Mexican participant on how a functioning market could be structured and each sides' interests in ensuring an efficient regulatory process.

- Room: Guadalajara

Panelists:

U.S.	Mexico
Elizabeth Moler, Chair, FERC	Jorge Eduardo Navarrete, SE
Susan F. Tierney, DOE	Hector Olea, CRE
David Pumphrey, DOE	Carlos Armndo Biebrich , SE
Richard O'Neill, FERC	Vicente Solano, SE
Charles Moore, Akin, Gump	Jorge Bazua, SE
	Javier Garfias, INE
	Raul Nocedal, CRE
	Roberto Cabral, SEMARNAP
	Gilberto Borja, ICA
	Leopoldo Rodriguez, Industries Resist

3:30-
4:00pm SEMINAR ON RENEWABLE ENERGY AND ENERGY EFFICIENCY

Theme: Role of government and private sector in renewable energy and energy efficiency.

Outcome: Opportunities for private sector; Open exchange for conducting business in Mexico.

- Room: Merida

Panelists:

U.S.	Mexico:
Bill White, DOE	Fernando Bueno, CONAE
Charles Meissner, DOC	Pablo Mulas, IIE
Peter Fox-Penner, DOE	Mateo Trevino, FIDE/ CFE
Robert Annan, DOE	Ma. Eugenia Perez, SE
Hank Santiago, DOE	Raul Monteforte, SE
Merwin Brown, Battelle, PNL	Enrique Portes, CONAE
Dale Osborn, Kenetech	Roberto Martin, Heliotechica
Jon Pietruskiewicz, Bechtel	Rafael Paredes, ATPAE
Jerry Brashear, ICF Kaiser	Felipe Ochoa, CIC
Byron Washom, Spencer Management	Jose Gersti, CYGNUS, EE
Joe Loper, Alliance to Save Energy	Hugo Flores Pueblo, CONAE
Elizabeth Richards, Sandia National Labs.	Joseph Zisman, Ultraingenieria Cogeneracion

rts an 4:00-
6:00pm Breakout Seminar on Renewable Energy
e. - Room: Merida
ipant 4:00-
ach 6:00pm Breakout Seminar on Energy Efficiency
ss. - Room: Veracruz

6:45pm Depart Four Seasons for Ambassador's Residence via shuttle buses

7:30-
9:00pm Reception hosted by Charge D'affaires Charles Brayshaw
- Location: Ambassador's Residence
Paso de la Reform 2414
Colonia Lomas de Chapultepec

9:00pm Depart Ambassador's Residence for Four Seasons

9:30pm Arrive Four Seasons

Resist

/22/95

BUSINESS DELEGATION AGENDA

TUESDAY, JUNE 20, 1995

9:00-
11:30am SEMINAR ON OPPORTUNITIES FOR NATURAL GAS INFRASTRUCTURE DEVELOPMENT

Theme: Improving the understanding of Mexico's new natural gas infrastructure opportunities.

Outcome: Clarification of the investment opportunities for private sect of both countries and identification of feasible projects for the development of Mexican natural gas infrastructure.

- Room: Gran Salon A & B

Panelists:

U.S.	Mexico
Bill White, DOE	Jorge Eduardo Navarrete, SE
Reginal Spiller, DOE	Ernesto Estrada, PGPB
Randy Barnard, Williams Co.	Manuel Ortiz de Maria, SE
Milt Honea, Noram	Luis Vazquez, AMGN
Ewell Muse, Tenneco	Mauricio Toussaint, SE
Tom Fisher, UNOCAL	Ma. Eugenia Perez , SE
Stan McLelland, Valero	Raul Nocedal, CRE
Don Juckett, DOE	Gilberto Galvez, Galvez International
	Ernesto Areola, Gas Industrial de Monterrey
	Victor Espinoza, Industrias Penoles
	Librado Rosales, HYLSA
	Jesus Sandoval, Vitro
	Oscar Frias, Industrias Resistol

11:30am-
1:30pm SEMINAR ON INDEPENDENT POWER GENERATION OPPORTUNITIES

Theme: Mexico's market for new electricity generation

Outcome: Private sector opportunities for investments, including joint venture opportunities, in independent power plants and identification formation of feasible projects.

- Room: Gran Salon A & B

Panelists:

U.S.	Mexico
Bill White, DOE	Jose Merino Manon, SE
Susan F. Tierney, DOE	Luis Almeida Duran, CFE
Charles Meissner, DOC	Raul Fuentes Samaniego, SE
Carlos Bing-Zaremba, Cogentrix	Vicente Solano Arreita, CFE
Eddie Kolodsiej, CSW International	Juan Eibenshutz Hartman, SE
John Vella, Mission Energy Corp.	Julian Terminal, GUTSA
Ron Fuller, San Diego Gas & Electric Co.	

TUESDAY, JUNE 20, 1995 continued

** Addition to Schedule **

1:30-
4:00pm CONTINUATION OF SEMINAR ON RENEWABLE ENERGY AND ENERGY EFFICIENCY
- Contact: Peter Fox-Penner, or Beth Arner for details.
- Room: Merida (tentative room)

1:30-
4:00pm *Open Time for Individual Private Sector Meetings*

4:00-
6:00pm SEMINAR ON FINANCING ISSUES INCLUDING JOINT VENTURE OPPORTUNITIES

Theme: Project financing in Mexico's energy markets.
Outcome: Opportunities for financing projects, including joint ventures.
- Room: Gran Salon A & B

Panelists:

U.S.

Bill White, DOE
Charles Meissner, DOC
Jack Carter, DOE
Lynn Coleman, Skadden, Arps, Slate, Meagher, & Flom
Hector Guiterrez, Enron Development Corp.
Alexander Penna, Chase Manhattan Bank
Justin Manson, Morgan Stanley & Co.
Ray Hutchison, Vinson & Elkins

Carlos Garcia Fernandez,SECOFI
Roberto Villareal, SHCP
Jorge Coliard, SHCP
Juan Manuel Romero, PEMEX
Victor Manuel Lopez, CFE
Eduardo Mapes, NAFIN
Mauricio Toussaint, SE
Jaime Alatorre, CMI
Antonio Souza, BANAMEX
Gabriel Barrera, Bancomext
Issac Waisel, Industias Resistol

7:15 pm Depart Four Seasons by bus for Secretariat of Exterior Relations, Tlatelolco

8:00-
9:30pm Reception hosted by Minister Pichardo
- Location: Secretariat of Exterior Relations
1 Ricardo Flores Magon
Colonia Centro, Tlateloco

9:30pm Depart Secretariat of Exterior Relations by bus for the Four Seasons

10:00pm Arrive Four Seasons

BUSINESS DELEGATION AGENDA

WEDNESDAY, JUNE 21, 1995

9:00-
10:30am SEMINAR ON SCIENCE AND TECHNOLOGY

Theme: Mexico's energy-related R&D and advanced technology priorities.

Outcome: Opportunities for joint research, development, and technolog demonstration in US-Mexican public-private partnerships.

- Room: Merida

Panelists:

U.S.	Mexico
Linda Trocki, Los Alamos National Lab.	Francisco Barnes, IMP
Reggie Spiller, DOE	Pablo Mulas, IIE
Peter Fox-Penner, DOE	Julian Sanchez, ININ
Don Juckett, DOE	Mariano Bauer, UNAM
Brian Ward, Cambridge Energy Assoc.	Ma. Eugenia Perez, SE
Luis Sanchez-Barreda, Bureau of Economic Geology	Raul Monteforte, SE
Robert Rosenberg, Gas Technology Info Inc.	Francisco Guzman, IM
	Miguel Balcazar Garci
	ININ

9:30-
10:30am Meeting with Director General Rogelio Gasca Neri, CFE

U.S. Delegation and Mexican Participants

- Room: Guadalajara

10:30-
11:30am Seminar Review & Summary Meeting

U.S. Delegation and Mexican Participants

- Room: Gran Salon A & B

Noon-
2:00pm Round Table Discussion with Deputy Secretary Bill White and Under Secretary Jorge Eduardo Navarette with Private Sector to Report Results of Seminars

- Room: Gran Salon A & B

2:00-
4:00pm Luncheon and Closing Remarks

Key guests:

Mexican Deputy Secretary of Energy Jorge Eduardo Navarrete
PEMEX Director General, Adrian Lajous
U.S. Deputy Secretary of Energy Bill White
U.S. Ambassador Jim Jones

- Room: Gran Salon A & B

WEDNESDAY, JUNE 21 Continued

:00- :30pm	PRESS CONFERENCE - Bill White, Jorge Eduardo Navarrete - Press Only - Room: Merida
:00- *:30pm*	*Open Time for Individual Private Sector Meetings*
:45pm	Depart Four Seasons for Citibank
:00pm	Arrive Citibank
:00- :30pm.	Reception hosted by Citibank and General Electric - Location: Citibank Building Paseo de la Reforma 390 18th Floor Col. Juarez
:30pm	Depart Citibank for Four Seasons
:45pm	Arrive Four Seasons

U.S. DEPARTMENT OF ENERGY DELEGATION TO MEXICO
Led by Deputy Secretary William H. White

BUSINESS DELEGATION AGENDA
Monterrey, Mexico

THURSDAY, JUNE 22, 1995

5:00am BAGGAGE CALL

5:30am Depart Four Seasons for Mexico City Airport via buses

6:00am Arrive Mexico City Airport via buses

* *Note: Most of the delegation are taking two flights to Monterrey*

6:55am DEPART MEXICO CITY FOR MONTERREY
ON MEXICANA FLIGHT # 007

7:00am DEPART MEXICO CITY FOR MONTERREY
ON AEROMEXICO FLIGHT # 230

8:15am MEXICANA FLIGHT # 007 ARRIVES AT MONTERREY AIRPORT

8:25am AEROMEXICO FLIGHT # 230 ARRIVES AT MONTERREY AIRPORT

8:50am Depart Monterrey Airport for CINTERMEX

9:15 Arrive CINTERMEX

9:15-
9:45am Introduction to Monterrey, the State of Nuevo Leon & the CINTERMEX International Conference & Expo Center by Jesus Franco, Director

Location: CINTERMEX
501 Parque Fundidora
Monterrey
Room: Europa

THURSDAY, JUNE 22, 1995 Continued

9:50-
12:40pm Mexican Company Presentations to be made to the U.S. delegation. Presentations will describe each companies future economic plans and the energy requirements of the local private sector.
- Room: United States.

9:50-
10:15am David Martinez Serna, Project Director, Secretariat of Economic Development, State of Nuevo Leon

10:15-
10:40am Carlos J. Vallejo, Director General, Nuevo Leon Financial Fund

10:40 -
11:00am Break

11:00-
11:25am Luis Fernando Barrozo, Marketing Director, Grupo Protexa, S.A.

11:25-
11:50am Nelson Arizmendi, Planning Deputy Director, Grupo Alfa, S.A.

11:50-
12:15pm Luis Farias, Energy Director, Cementos Mexicanos, S.A. (CEMEX)

12:15-
12:40pm Carlos Espinal, Director General, Conductores Monterrey, S.A. (AXA)

12:45-
2:15pm Luncheon with Monterrey Private Sector
Speaker: Bill White
Location: CINTERMEX
Room: United States

2:15pm Luncheon ends
-Arrangements will be made departing CINTERMEX for Airport depending on participants flight schedule

U.S. Department of Energy Mission to Mexico

Monday, June 19,1995 3:30-5:30
Four Seasons Hotel
Room: Guadalajara

SEMINAR ON MEXICAN REGULATORY DEVELOPMENT

THEME: Offering interested businesses and U.S. regulatory experts an opportunity to understand the formulation of Mexican regulations on gas transmission, distribution, and storage.

OUTCOME: A working knowledge by both U.S. and Mexican market participants on how a functioning market could be structured and each sides' interests in ensuring an efficient regulatory process.

MODERATOR: Sue Tierney, US DOE Hector Olea, CRE

PANELISTS:

U.S.	MEXICO
Elizabeth Moler, FERC	Jorge Eduardo Navarette, SE
Richard O'Neill, FERC	Hector Olea, CRE
David Pumphrey, DOE	Carlos Armando Biebrich, SE
Charles Moore, Akin, Gump	Vicente Solano, SE
	Jorge Bazua, SE
	Javier Garifias, INE
	Raul Nocedal, CRE
	Roberto Cabral, SEMARNAP
	Gilberto Borja, ICA
	Leopoldo Rodriquez, Industrias Resistol

PROGRAM

3:30 Energy Strategy in Mexico and the role of regulations - Jorge Eduardo Navarette, SE

3:40 Description of regulations and goals - Hector Olea, CRE-

4:00 U.S./Mexico joint presentation: Readout from Houston Workshop on Gas Regulations (Mexico/U.S./Canada) issues raised, outcomes, next steps - Raul Nocedal, CRE and David Pumphrey, DOE

4:15 **Question & Answer and Discussion Period**

US and Mexican Private Sector views and contributing ideas on energy regulations, NAFTA and economic competitiveness

Energy Regulatory framework: agencies, scope, responsibilities, structure

Regulatory framework and private sector concerns: foreign investment rules, role of PEMEX and CFE, contract requirements, interconnection, access, cross border import/export, environmental regulations and compliance

US and Mexico private sector cooperation toward efficient, competitive, and mutually beneficial energy regulations

5:20-
5:30 **Closing Remarks and Conclusions by Moderators**

REPORT ON REGULATORY SEMINAR

SUMMARY

- **Under Secretary Navarette** opened the Seminar with a description of Mexico's new energy strategy based on expanding the opportunity for private investment to meet energy requirements. He described the new law allowing private investment in natural gas pipelines, storage and distribution. He stressed that the goal is to make energy investment as efficient as possible to meet Mexico's energy goals.

- **Hector Olea**, Chairman of the Energy Regulatory Commission, provided a description of the principles and objectives underlying the regulations being developed to implement the amendments to Petroleum Regulatory Law allowing investment in natural gas pipelines, storage and distribution.

- Olea said the principal characteristics for the new regulatory structure are: that it be consistent with the regulatory environments in the United States and Canada; that it support financable projects by guaranteeing certainty of the investment and a reasonable profit; and that it promote competition.

- Olea said that the goal is development of a set of rules that are stable, clear, and transparent. Olea identified the need for a regulatory institution that has a degree of autonomy, has the necessary instruments and tools, and has the capacity to enforce the regulations and orders. The regulations should promote but not control investment.

- **Chair Moler** described how the U.S. regulatory structure developed over time in response to changes in the structure and needs of the industry. She agreed with Secretary Pichardo that "the perfect should not be the enemy of the good" in developing regulations. The process of defining the regulatory framework is a dynamic process. The CRE must try to develop the best set of regulations that it can and monitor industry response. As the industry changes, the regulations can evolve.

- A representative of the Mexican private sector commented that a favorable regulatory structure should accept long term contracts, must be clear on specific issues, must take account of contractual relationships,

and allow firms to generate income.

- Numerous questions were asked by various participants about different aspects of the regulatory structure, how competition can be assured, how the existing infrastructure will be incorporated into the regulatory structure. Additional questions were raised about the further development of the electricity regulations.

- Olea replied that specifics are not available on the regulatory structure but that the vision is to promote competition and promote investment. Open transportation will be a keystone of the regulations. Nondiscriminatory access is a core principal of the vision.

- Olea stressed that transparency in the development of the regulations is critical. The Mexican government will seek input and public comment from all parties on the regulations being developed. He invited all companies to provide him with their views. He also said that their intention is to keep the regulations a simple as possible but that they will be comprehensive

NEXT STEPS

- Sue Tierney suggested that the companies offer comment on about the desired features of the regulatory framework that will make investment attractive.

- The regulatory authorities agreed to continue promotir and strengthening North American cooperation consultation process for the drafting of the new regulations.

U.S. Department of Energy Mission to Mexico

Monday, June 19, 1995 3:30pm - 6:00pm
Four Seasons Hotel
Room: Merida

SEMINAR ON RENEWABLE ENERGY AND ENERGY EFFICIENCY

THEME: Role of Government and Private Sector in Renewable Energy and Energy Efficiency

OUTCOME: Opportunities for Private Sector; Open Exchange on Needs for Conducting Business in Mexico

PANELISTS:

U.S.	Mexico
Bill White, DOE	Fernando Bueno, CONAE
Charles Meissner, DOC	Pablo Mulás, IIE
Peter Fox-Penner, DOE	MateoTrevino, FIDE - CFE
Robert Annan, DOE	Ma. Eugenia Pérez,SE
Hank Santiago, DOE	Raúl Monteforte, SE
Merwin Brown, Battelle, PNL	Enrique Portes, CONAE
Dale Osborn, Kenetech	Roberto Martin , Heliotechica
Jon Pietruszkiewicz,Bechtel	Rafael Paredes, ATPAE
Byron Washom, Spencer Management	Felipe Ochoa, CIC
Jerry Brashear, ICF Kaiser	Joseph Zisman, Ultraingeneria Cogeneration
Joe Loper, Alliance to Save Energy	José Gerstl, CYGNUS
Elizabeth Richards, Sandia National Lab	Hugo Flores Puebla, CONAE

PROGRAM

3:30 **Presentation by Fernando Bueno, CONAE**

Topics:
- Mexican programs, regulations, funding
- Role of private sector and government

3:40 **Presentation by Peter Fox-Penner, DOE**

Topics:
- U.S. programs in the context of NAFTA
- Perspective on North American market growth and role of U.S. technology

4:00 **Break-Out Roundtable Discussion Sessions**

Break-out sessions will consist of two round table discussions, one on renewable energy (RE) and the other on energy efficiency (EE). Mexican and U.S. government officials, as well as selected industry delegates will sit at the table, with the rest of the delegation and guests sitting in the audience.

BREAKOUT PANEL ON RENEWABLE ENERGY (RE)

Room: Merida
Moderators: Pablo Mulás (IIE) and Robert Annan (U.S. DOE)

PANELISTS:

U.S.	Mexico
Bill White, DOE	Pablo Mulás, IIE
Robert Annan, DOE	Raul Monteforte, SE
Elizabeth Richards, Sandia National Lab	Roberto Martin, Heliotechnica
Dale Osborn, Kenetech	Rafael Paredes, ATPAE
Jon Pietruszkiewicz,Bechtel	
Byron Washom, Spencer Management	

PROGRAM:

4:00 **Presentations by Mexican Government Officials**
Topic:
- Mexican perspective on RE project development: priority sources and technologies, opportunities and needs for private RE projects (geothermal, wind generation, solar energy, biomass, refuse-to-energy)

Presenters: Pablo Mulás, IIE
Raúl Monteforte, SE

4:20 **Presentation on U.S./Mexico Renewable Energy Programs**
Presenter: Elizabeth Richards,Sandia National Laboratories

4:30 **U.S. Industry Presentations**
Each U.S. industry delegate takes no more than 5 minutes to introduce self, company, technology, interest in Mexico and proposed scope of participation (funding possibility, strategic alliance, licensing, sales representatives; U.S. technology, management skills, and funding methods that could be transferred to Mexican partners).

5:10 **Break**

5:15 **U.S. Industry Issue Discussion**
Topics:
- U.S. industry needs, concerns and competitive position to develop Mexican market
- U.S./Mexico RE export business to other world markets

Presenters: Byron Washom, Spencer Management Associates
Dale Osborn, Kenetech
Jon Pietruszkiewicz, Bechtel

:30 **Questions & Answers and Discussion Period**

The question and answer period will be open to all participants and audience members. Either written questions or oral will be acceptable.

:45-
:00 **Closing Remarks and Conclusions by Moderator**

C2

Report on Seminar on Renewable Energy (RE)

SUMMARY

- The foremost observation is that Mexico is failing to fully exploit the available multi- and bi-lateral sources of funds for the deployment of renewable energy and energy efficiency programs. These funds are typically grant and soft loan programs to the applicant country. India, China and Indonesia are aggressively pursuing these funding opportunities, and are simultaneously internalizing the manufacturing of these technologies for future substantial development, economic growth and export sales. Mexico is at a critical juncture of either being a future buyer or manufacturer of renewable energy technologies for the balance of the decade and into the next century.

Technology and Applications Issues

Off-Grid RE Systems

- The village and rural electrification program represents one of the most visible federal programs for renewable energy by the Mexican government. What plans do CFE and IIE have in expanding this program with commercial photovoltaic (PV) systems?

- There exists an even larger opportunity for PV and other renewable energy systems with back-up, remote and supplementary power applications in communications, transportation, commercial building, tourism, and municipal services. The role of CONAE is important in this field in relation to the promotion and execution of these projects.

- In response to these markets, Mexico may wish to review its import tariff policy that currently favors the importation of selected PV components rather than domestic manufacture. Alliances with solar cell manufacturers need to be strengthen for technology transfer under competitive licensing agreements.

- Geothermal energy can be used for direct heat applications such as process heat and district heating as well as in the generation of electricity. This application should be explored for Mexican use.

- What is the interest of the Mexican authorities in new high-energy battery technology for electric vehicle application?

On-Grid RE Systems

- Is there a plan to enlarge the 1.5 MW wind site in the private sector? If so, based on what schedule?

- Border region development may offer excellent opportunities for the early

implementation of on-grid RE systems? Increased grid interconnections in this region are important to facilitate bi-directional electricity sales and the implementation of renewable energy.

- Studies are recommended to quantitatively analyze the economic value possible for distributed generation of electricity by PV and other technologies. Such applications can avoid significant costs associated with transmission and distribution and other factors.

- The Mexican government should provide the permittable access to multi- and bi-lateral funding to the private sector in order to permit renewable energy projects to compete in future open IPP competitions.

- Mexico has grown into a world leader in geothermal energy and this represents an opportunity for increased collaboration in the global market. U.S. and Mexican links in this field represent not only a good opportunity for furthering the technological capabilities of both countries but also the selling and offering of services to other countries.

- Are there definitive plans and schedule for a Request for Proposals specifically directed to geothermal resources? In this context, are there plans for CFE to accept bids for turn-key projects, with the possible inclusion of resource development?

- Do projections for the growth in electricity demand and natural gas needs take into account the system efficiency gains possible from advanced systems and the use of renewable energy?

Institutional and Regulatory

- Regarding the primary issue of renewable energy introduction, will future procurements of electrical generation capacity include set-asides for a set minimum contracting level of RE capacity? Or will the scoring methodology include attributes for RE systems with respect to fuel efficiency or environmental offsets? The US experience suggests that standardized agreements have proven to be an effective mechanisms for commercializing renewable energy systems.

- What are the schedule and procurement structure for rural electrification over the next several years?

- What are the status and plans for government renewable energy programs under the current budgetary constraints, including the 95% to 97% domestic electrification expansion?

- Will a single agency be designated with the lead responsibility for the development and commercialization of renewable energy technologies and systems?

- In this regard, what is the emerging role of CONAE with respect to the commercialization of renewables in the private sector?

- What are the prices for back-up electricity supply, wheeling and purchase of small/surplus electricity sold to CFE?

- A stable, transparent pricing and regulatory structure for the implementation of renewable energy is vital to their commercialization. When will this infrastructure be established?

- Renewable energy systems have direct and significant environmental benefits. What is the level of Mexican interest in exploiting this potential? How are these benefits to be recognized and credited?

- As previously experienced in the US, the 30 MW limit for small power producers may be too restrictive for RE systems, therefore, the Mexican government may wish to exclusively raise this limit in order to provide more private investment incentive in such systems.

- A strong power purchase agreement with CFE or other customers is essential to reaching financial closure on any project.

- The use and implementation of RE is an issue of sustainable energy in an increasingly complex world energy picture. It is <u>not</u> a third world issue of limited significance to Mexico and the US.

Next Steps

- Continue and intensify resource assessment for renewable energy resources in Mexico.

- Provide follow-up forums to facilitate the identification of joint-venture partners.

- Pre-feasibility studies are a very important initial step in the assessment and acceptance of a project, and greatly enhance the potential for success. Additional funds from multi- and bi-lateral agencies and NGO's are recommended to enhance such efforts.

- Implement the sustainable growth plan of RE technologies through prototype systems and other measures to provide a critical accelerating step in their commercialization.

- A conference to share experiences and to fully explore and brainstorm the potential impacts of deregulation on the commercialization of renewable energy.

BREAKOUT PANEL ON ENERGY EFFICIENCY (EE)

Room: Vera Cruz
Moderators: Fernando Bueno, CONAE and Peter Fox-Penner, U.S. DOE

PANELISTS:

U.S.	Mexico
Peter Fox-Penner, DOE	Fernando Bueno, CONAE
Merwin Brown, Battelle, PNL	Mateo Trevino, FIDE - CFE
Hank Santiago, DOE	Jose Gersti, CYGNUS
Joe Loper, Alliance to Save Energy	Felipe Ochoa, CIC
Larry Silverman, Light Media Corp.	
Fernando de Larranaga, Watt Stopper	
Jerry Brashear, ICF Kaiser	

PROGRAM:

4:00 **Presentations by the Mexican Government**
Topics:
- Opportunities for EE industry in Mexico
- Process for developing EE projects in Mexico
- Mexican industry needs from U.S. participation

Presenters: Mateo Trevino / FIDE - CFE
Fernando Bueno / CONAE

4:20 **Presentations by U.S.**
Topic:
- U.S./Mexican EE programs

Presenter: Peter Fox-Penner / U.S. DOE

4:40 **U.S. Industry Presentations**

Each U.S. industry delegate takes no more than 5 minutes to introduce self, company, technology, interest in Mexico and proposed scope of participation (funding possibility, strategic alliance, licensing, sales representatives; U.S. technology, management skills, and funding methods that could be transferred to Mexican partners).

5:10 **Break**

5:15 EE Questions and Discussion: Mexican and U.S. EE industries discuss remaining issues of concern, collaboration, and projects.

5:30 **Questions & Answers and Discussion Period**

The question and answer period will be open to all participants and audience members. Either written questions or oral will be acceptable.

5:45-
6:00 **Closing Remarks and Conclusions by Moderator**

Report on the Energy Efficiency Seminar

SUMMARY

- The mission has been very informative and an excellent opportunity to make contacts in the Mexican energy industry.

- The sessions on energy efficiency were well attended from both sides of the Border. Representatives from CONAE and FIDE confirmed in their presentations that there are enormous opportunities for improved energy efficiency in all sectors of the Mexican economy. I was shocked to learn, for example, that for Mexican industry, energy costs are 10-30 percent of total production costs. That is very high by US standards, which are typically around 5 percent.

- The presence at the session -- on rather short notice -- of several US suppliers of energy efficiency products and services demonstrates the desire of the US energy efficiency industry to be more active in Mexico. There appears to be no problem generating interest of US energy efficiency companies in the Mexican energy efficiency markets.

- While US companies are extremely interested in working in Mexico, they also recognize that there are more obstacles to successfully selling their products and services in Mexico. They are in it for the long term, hoping that their current investments in time and resources will bear fruit in future years.

- The US representatives were very encouraged by the Mexican interest in working with US companies. Mexico and the US share many of the same obstacles to improved energy efficiency. US companies have had more than a decade of experience competing with low energy prices, scarcity of financing, and the lack of familiarity with energy efficiency technologies and concepts. The obstacles to improved energy efficiency in Mexico are hardly new to US companies.

- Having said that, there are a number of ways that the Mexican government and others can encourage investments in energy efficiency. The energy efficiency representatives think that it is essential to examine and establish policies that recognize the benefits of improved energy efficiency to economic productivity, environmental quality and international competitiveness.

- Among the areas that seminar participants encourage the Mexican government to explore are:

a) market-based environmental incentives, such as emissions trading;

b) fiscal policies that affect energy production and consumption;

c) integrated resource planning and the reform of electricity pricing policies;

d) expansion of investments in energy efficiency in the public sector. If energy use in the US government is any indicator, the Mexican public sector represents an enormous opportunity to save taxpayer dollars.

NEXY STEPS

o In a follow-up meeting on June 20, the efficiency representatives recommended follow-up meetings with FIDE and CONAE and their US counterparts, to do the following:

a) explore ways to establish contacts between US companies and end-use decision-makers from Mexican government, industry, and the commercial sector;

b) discuss financing terms available from US companies;

c) explore assistance available from multi-lateral and bi-lateral financial organizations;

d) identify ways to increase the prominence of energy efficiency within CFE and the Mexican government at large.

o Specific activities that might result from those meetings include:

a) A series of combined workshops and mini trade expositions. For example, we might have a presentation to Mexican energy end-users that lays out ten things end-users should know before contacting an energy management controls company. End-users would then have an opportunity to visit booths of both US and Mexican energy management controls companies. Similar workshops might focus on lighting opportunities, HVAC, motors and drives, etc. As part of these workshops, we would hope to facilitate opportunities for one-on-one meetings between vendors and potential clients.

b) Meetings between US utilities and officials from CFE to discuss ways in which US utilities can share their enormous experiences with CFE.

c) Meetings between CFE and Luz y Fuerza to discuss mechanisms for shared-savings between utilities and

industry for applying energy efficiency technologies.

d) Discussions with Mexican government officials about instituting a federal energy management program. Again, both US government officials and representatives from the private sector can help Mexico develop and effective energy management system that will save taxpayer dollars.

- We all look forward to working together again in the future, and appreciate this opportunity to address this distinguished audience.

U.S. Department of Energy Mission to Mexico

Tuesday, June 20, 1995 9:00-11:30
Four Seasons Hotel
Room: Grand Salon A and B

SEMINAR ON OPPORTUNITIES FOR NATURAL GAS INFRASTRUCTURE DEVELOPMENT

THEME Improving the understanding of Mexico's new natural gas infrastructure opportunities.

OUTCOME: Clarification of the investment opportunities for private sector of both countries and identification of feasible projects for the development of Mexican natural gas infrastructure.

MODERATOR: Reginal Spiller, DOE Jorge Eduardo Navarratte, SE

PANELISTS:

U.S.	MEXICO
Bill White, DOE	Jorge Eduardo Navarrete, SE
Randy Barnard, Williams Co.	Ernesto Estrada, PGPB
Milt Honea, Noram	Manuel Ortiz de Maria, SE
Ewell Muse, Tenneco	Luis Vazquez, AMGN
Tom Fisher, UNOCAL	Mauricio Toussaint, SE
Stan McLelland, Valero	Ma. Eugenia Perez, SE
Don Juckett, DOE	Raul Nocedal, CRE
	Gilberto Galvez, Galvez International
	Ernesto Arreola, Gas Industrial de Monterrey
	Victor Espinoza, Industrias Penoles
	Librado Rosales, HYLSA
	Jesus Sandoval, Vitro
	Oscar Frias, Industrias Resistol

PROGRAM

9:00 **Introduction and Overview**

U.S.: Bill White
Mexico: Jorge Eduardo Navarrete

9:15 *U.S. gas resources and projected needs* - Don Juckett, DOE

9:30	**Presentation by Mexican Participants**
	Fuel policy and gas development in Mexico - Ernesto Estrada and Mauricio Toussaint, SE
9:45	Highlights from the new natural gas infrastructure. Regulatory Law. Implementation of private investment in the gas industry: priorities and preferences - Raul Nocedal, SE
10:00	**Presentation by U.S. Participants**
	Mexico/U.S: gas infrastructure development as seen from U.S. industry perspective - Milt Honea
	Opportunities for U.S. investments and benefits to Mexico - Tom Fisher
	U.S. industry needs to encourage investment - Randy Bernard
	U.S. industry commitments and competitiveness in the Mexican gas market
10:25	Break
10:30	**Question & Answer and Discussion Period**
	Regional preference and market growth Pricing and supplies Project implementation, sub-contracting and local sourcing Service quality and consumer benefits
11:20-11:30	**Closing Remarks and Conclusions**
	U.S.: Bill White Mexico: Jorge Eduardo Navarrete

REPORT ON SEMINAR ON OPPORTUNITIES FOR NATURAL GAS INFRASTRUCTURE DEVELOPMENT

Summary:

- This session provided an opportunity to build upon and expand the outcomes of the seminar on Mexican Regulatory Development.

- The natural gas resource base in the U.S. is seen as large and capable of sustaining further growth in markets.

- The natural gas resource base in Mexico is large and PEMEX has plans to increase production to meet consumption growth projections of an additional 1,760 Mcf/d for domestic use and additional volumes for possible export.

- The U.S. and the Mexicans have a vision of a North American market for their gas resourees, technology and business development.

- Natural gas initiatives are part of a comprehensive effort to rationalize Mexico's energy policies. Natural gas will play a major role in meeting Mexican policy objectives for electricity generation and meeting environmental requirements for urban areas and targeted industrial corridors.

- Mexico has set an objective for increasing the use of natural gas from 32% of primary energy consumed in 1992 to 51% by 2005.

- To accomplish this objective will require significant investment in the infrastructure for transportation of natural gas and clear linkage to Mexico's national development plans (distribution, pipelines, and storage). Reforms to the Regulatory Law of Constitutional Article 27 provide the framework for attracting private investment in the Mexican natural gas infrastructure.

- Implementation of the legislative changes through development of regulatory policy is underway with a target of November, 1995.

- U.S. companies see potential opportunities for investments in the infrastructure in areas of distribution, transportation, and natural gas storage facilities if regulations, once completed, are favorable.

- Clarification of the regulatory environment is critical to converting these opportunities into business deals.

- Mexican companies (steel, chemicals) have a stake in the implementation of the new infrastructure legislation.

- Mexican companies have concerns about future availability of gas, prices and price stability, competition for available gas, and deliverability/reliability.

- Based on statements of CRE representatives, development of the regulations governing the components of the infrastructure changes are being formulated and no aspect has been overlooked or excluded.

- Equity investors will compare Mexican infrastructure development opportunities with other opportunities throughout the world once clarifying regulations are complete.

Concerns:

- Certainty and stability of regulations governing the infrastructure are necessary to provide the climate that will attract investment capital. Areas where regulatory uncertainty creates needs for more information and interactions include:

  - Market creation
  - Permitting process
  - Granting authorities defined
  - Eminent domain
  - Franchise boundary definition
  - Exclusivity of contracts
  - LPG subsidy elimination
  - Pricing structure
  - Rate structure for transportation - new and existing
  - Availability and types of transportation access
  - Standards for safety and operations
  - Standards for reliability and integrity of components
  - Standards for gas quality
  - Contracts with the producer (PEMEX) and other sellers
  - Custody transfer requirements
  - Nominations and balancing
  - Curtailment
  - Needs for storage capacity related to displacement of fuel oil
  - Types of storage (reservoirs, etc.)
  - Title to gas in storage
  - Fate of displaced fuel oil from power plants
  - Capacity allocation

Recommendations and actions (Next steps)

- Publish process and schedule for review and comment on regulations to

accompany the new natural gas infrastructure laws.

- Develop forums to build understanding and trust between the parties involved in infrastructure activities.

- Recommend that the U.S. companies be invited to participate in a process established under the auspices of a neutral entity (TBD), to create a series of targeted workshops with specific focus areas and participants, (U.S. companies, Mexican companies, PEMEX, regulators, and other government and private sector experts), designed to share information, discuss problems in areas of uncertainty, and recommend solutions (options). The outcomes from these workshops would be reported to a steering committee comprised of (TBD) that would report workshop results to senior Mexican government energy authorities.

U.S. Department of Energy Mission to Mexico

Tuesday, June 20, 1995 11:30 - 13:30
Four Seasons Hotel
Room: Grand Salon A and B

SEMINAR ON INDEPENDENT POWER GENERATION OPPORTUNITIES

THEME: Mexico's market for new electricity generation.

OUTCOME: Private sector opportunities for investments, including joint venture opportunities, in independent power plants, and identification of feasible projects.

MODERATOR: Susan Tierney, DOE

Luis Almeida Duran, CFE

PANELISTS:

U.S.

Bill White, DOE
Susan Tierney, DOE
Charles Meissner, DOC
Carlos Bing-Zaremba, Cogentrix Energy Inc.
Eddie Kolodziej, CSW International
John Vella, Mission Energy Corp.
Ron Fuller, San Diego Gas & Electric Co.

Mexico

Jose Merino Manon, SE
Luis Almeida Duran, CFE
Raul Fuentes Samaniego, SE
Vincente Solano Arrieta, CFE
Juan Eibenschutz Hartman, SE
Julian Terminal, GUTSA
Gustavo Diaz, Planta Electrica Grupo Industrial

PROGRAM

11:30 **Presentation by the Mexican Government Officials**

Topics:

- Projected future electric power needs for Mexico over the near-and long-term, fuel mixes, and resource requirements to meet load growth projections, including plant upgrading and fuel switching at existing generating facilities.
- National policies and goals for private investment in the electricity sector: modalities and schemes, fuel supplies and prices, power sales, transmission, sale prices, terms, and conditions.
- Priority projects and preferences for participation by private investors.
- Official plans for bidding processes for private investment in electricity.

Presenters: Luis Almeida, SE
Juan Eibenschutz, CFE

2:00 **Presentation by U.S. Business Delegation Members**

Topics:

- U.S. business interest and concerns in participating in Mexican electricity sector.
- U.S. technology, management skills, and financing methods that could be transferred to the Mexican market.
- Opportunities for joint venture projects in the Mexican electricity sector.
- Opportunities for export of fuels from the U.S. for Mexican generation facilities.
- Opportunities for cross-border joint development of electricity projects.

Presenters: John Vella, Mission Energy
Carlos Bing-Zaremba, Cogentrix
Ron Fuller, San Diego Gas & Electric
Eddie Kolodziej, CSW International

12:25 **Break**

12:30-1:20 **Question & Answer and Discussion Period**

The question and answer period will be open to all participants and audience members. Either written questions or oral will be acceptable.

1:20 - 1:30 **Closing Remarks and Conclusions by Moderators**

Seminar on Independent Power Generation Opportunities

SUMMARY

- The Mexico electric sector offers large opportunities for private investment in self-generation, cogeneration, and independent power production. The Mexican government is working to develop a regulatory framework to provide the certainty and transparency needed by the private sector to make investments.

- CFE needs to modernize and retrofit existing generating facilities to use natural gas, due to new environmental requirements. This provides a good opportunity for private investors. The Secretaria de Energia (SE) is working on a strategy and priorities to do this. Regulatory policies will be developed, based on a detailed study of the industry.

- SE's goal is to develop policies to make CFE efficient and effective in serving the public. CFE needs to operate in a competitive market. CFE will need to restructure, but Mexican officials are not sure how to do this yet. It may be appropriate to separate CFE into regions or into separate cost and responsibility centers, similar to PEMEX.

- CFE expects private investors to concentrate on developing new electric generation while CFE concentrates on modernizing and expanding its transmission and distribution facilities. By 2003, CFE will need about 12,204 MW of new generating capacity, 8,100 MW of which will be offered for bids by the private sector, beginning in 1995-96. There also will be opportunities for private investment in transmission.

- CFE also will provide services to IPPs such as wheeling, back-up and supplemental power. These services are available now, but the government still needs to work out the details on prices, terms, or conditions offered by CFE for these services.

- Mexico is working on regulations to attract private investment in the natural gas sector, which will be important to facilitate private investment in electricity.

- SE is available to provide information to interested partied to satisfy the doubts of US and Mexico industry.

- The need for new transmission investment will grow with the addition of new generating plants. US companies are interested in opportunities for private investment in this segment of the power sector.

CONCERNS

- Mexico needs to resolve several issues in order to make new private investment financiable, including providing for long-term power purchase agreements and long-term fuel supply agreements for independent power projects.

- To participate in Mexico's electricity sector, IPPs need information on issues such as the price CFE would charge for back-up and supplemental power and for wheeling services, interconnection fees, prices paid for power sold from an IPP to CFE, and whether one industrial generating facility would be able to wheel power to its other facilities.

- Regulations should be developed that will provide certainty and clarity in the approval process, and a clear line of authority in the Mexican government to approve projects.

- Mexico's industrial sector is concerned about adequate, reliable electricity supplies, quality of service (i.e., no voltage fluctuations), and price stability. CFE's rates are reasonable, but there is some concern about price stability and the quality of its service in the future.

- SE should simplify the bidding process for independent projects; now it takes up to 2 years for approval, which discourages private investment.

- Private investors need more clarity on opportunities for private investment in repowering projects and in expansion and upgrading transmission and distribution.

- CFE should not regulate outcomes (e.g., predetermine siting, fuel type, technology, etc.) for new generating plants. It should determine need and the price it will pay, and environmental requirements, and let the market determine the best way to meet these needs.

- US firms are interested in providing equipment and engineering and other services to CFE for new generating and transmission facilities, in addition to building new power plants.

- Policies for developing new generating plants along the US/Mexico border may be different than for new plants in other locations. This should be recognized by SE and CFE in establishing policies and planning for new development.

- The Mexican government needs to coordinate policies and programs between the electricity sector (CFE) and the basic fuel sector (PEMEX).

NEXT STEPS

- US companies are interested in working with CFE and SE to provide information on what is needed to make new projects financible.

- US companies, DOE and FERC are available to provide formal or informal comments on draft regulations developed for Mexico's natural gas and electricity sectors.

- Follow-up workshops, focused on a narrower range of electricity and regulatory issues, that would include the appropriate combination of CFE, SE, CRE, DOE, FERC, US and Mexican businesses, may be appropriate.

- US utility and IPP companies are prepared to arrange for site visits and workshops in the US for CFE, SE and other organizations regarding US company activities in integrated resource planning (IRP), demand-side management (DSM), transmission and distribution planning and expansion, environmental controls, pricing, etc.

- A workshop on electricity regulatory reform issues within the next year or two, coordinated with FERC, USAID, and other entities as needed, may be appropriate.

- DOE will monitor the status of several projects involving U.S. companies, and will maintain contact with developers and Mexican government officials to obtain information on project and policy development.

U.S. Department of Energy Mission to Mexico

Tuesday, June 20, 1995 4:00pm-6:00pm
Four Seasons Hotel
Room: Grand Salon A and B

SEMINAR ON FINANCING ISSUES INCLUDING JOINT VENTURE OPPORTUNITIES

THEME: Project financing considerations in Mexico's energy sector

OUTCOME: Opportunities for financing projects including joint ventures

MODERATOR: Jack Carter, DOE Roberto Villareal, SHCP

PANELISTS: U.S.	Mexico
Bill White, DOE	Carlos Garcia Fernandez, SECOFI
Charles Meissner, DOC	Roberto Villareal, SHCP
Lynn Coleman, Skadden, Arps, Slate, Meagher & Flom	Jorge Collard, SHCP
Hector Gutierrez, Enron Development Corporation	Juan Manuel Romero, PEMEX
Alexander Penna, Chase Manhattan Bank	Victor Manuel Lopez, CFE
Justin Manson, Morgan Stanley	Eduardo Mapes, NAFIN
Ray Hutchison, Vinson & Elkins	Mauricio Toussaint, SE
	Jaime Alatorre, CMI
	Antonio Souza BANAMEX
	Gabriel Barrera, Bancomext
	Issac Waisel, Industrias Resistol

PROGRAM

4:00 **Presentation by Mexican Financial Community**

Topics:

- Mexican laws, regulations, conditions and guarantees related to financing of energy projects
- Project approval process, and final decision making process
- Role of various ministries
- Mexican perspective concerning risk allocation and profitability of private investments in energy projects

- Mexican priorities, requirements and opportunities for joint venture partnering

Presenters:

Roberto Villareal, SHCP
Carlos Garcia Fernandez, SECOFI
Eduardo Mapes, NAFIN

4:30 **Presentation by U.S. Financial Community**

Topics:

- Opportunities for project financing and joint ventures from a developer perspective: equity financing and alternative schemes, project requirements, long-term investment capability - Hector Gutierrez, Enron Development Corp

- Opportunities for project financing from a banking perspective: debt financing, financial requirements, risk sharing and long term commitments - Alexander Penna, Chase Manhattan Bank

- Project financing from an international finance institution perspective: issues in portfolio investment through securitized debt, project finance and equity and strategic investment through joint venture or strategic alliances - Justin Manson, Morgan Stanley & Co

- Legal and regulatory issues to project financing - Lynn Coleman, Skadden, Arps, Slate, Meagher & Flom

5:00 **Question & Answer and Discussion Period**

The question and answer period will be open to all participants and audience members. Either written questions or oral will be acceptable.

5:50-
6:00 **Closing Remarks & Conclusion by Moderators**

REPORT ON FINANCIAL SEMINAR

SUMMARY

- There is general agreement that the progress and commitment demonstrated by Mexican government actions is impressive.

- Financing is currently not available, but the commitment of the Mexican government to attract foreign investment should correct this situation over time.

- There are encouraging signs as a result of the (1) changes in the current law allowing Independent Power Producers (IPP) to compete for power generation projects; (2) changes in the natural gas law to allow for private investment in transmission and distribution pipelines construction; and (3) continued commitment to privatize the energy sector by the Mexican government.

- The participation of some 80 U.S. energy companies in this mission plus an equivalent number of Mexican businesses, is a strong indication of the energy industry interest in Mexico.

- The financial seminar panelists fully endorsed the recommendations of the independent power generation, natural gas, and regulatory seminars. Specifically,

  - Completing the development of open and transparent regulations and a legal framework that allows foreign investments.

  - Allowing long term fuel supplies and power purchase agreements for power generation projects.

CONCERNS

- There is worldwide competition for project finance capital. Project developers will go where financial terms and conditions are favorable (examples being India, Pakistan, and China).

- Even though private investment is now allowed in the power generation and natural gas transmission and distribution areas, both PEMEX and CFE will continue to dominate their respective industries.

- Mexico should avail itself of all possible types of financing structures which may include recourse and non-recourse financing as well as resources offered by the international financial community (World Bank, EXIM, OPIC, IDB, etc.)

- Equity financing will be important to Mexico's ability to attract international project financing. Because of the difficulty in financing projects, more equity will be required in

future projects. As more banks require increased equity positions on the part of developers, developers need to be able to turn to such programs as OPIC, which provides investor equity and construction risk insurance.

- In the cogeneration area, Mexico should complete wheeling regulations and consider revisiting the current 20 MW legal limitation.

- The availability of long term fuel supply is a crucial factor in advancing the financiability of private power projects.

NEXT STEPS

- Mexico is encouraged to continue efforts to join the World Bank's Multilateral Investment Guarantee Agency (MIGA) and to consider further its concerns about joining OPIC.

- The finance panel encourages the development of a process in which companies, both U.S. and Mexican, can provide input to the development of the natural gas and electricity regulations.

- Explore options to develop public forum opportunities whereby U.S. and Mexican companies and government institutions can continue to exchange information, identify common barriers, and develop common solutions.

U.S. Department of Energy Mission to Mexico

Wednesday, June 21, 1995 9:00am - 10:30am
Four Seasons Hotel
Room: Merida

SCIENCE AND TECHNOLOGY SEMINAR

THEME: Mexico's Energy-Related R&D and Advanced Technology Priorities

OUTCOME: Opportunities for joint research, development, and technology demonstration in U.S.-Mexican public-private partnerships

MODERATOR: Dr. Linda K. Trocki, LANL — Dr. Francisco Barnés de Castro, (IMP Director General)

PANELISTS:

U.S.	Mexico
Peter Fox-Penner, DOE	Francisco Barnés, IMP
Reggie Spiller, DOE	Pablo Mulas, IIE
Don Juckett, DOE	Julian Sanchez, ININ
Brian Ward, Cambridge Energy Assoc.	Mariano Bauer, UNAM
Luis Sanchez-Barreda, Bureau of Economic Geology	Ma. Eugenia Pérez, SE
	Raul Monteforte, SE
Robert Rosenberg, Gas Technology Info Inc.	Francisco Guzman, IMP
	Miguel Balcazar Garcia, ININ

9:00 **Presentation by the Mexican Participants**

Topics:

- Activities, plans and priorities for R&D in the energy sector.
- Technology needs in the energy sector, recent developments, acquisition, adaptation or integration of advanced technology.
- Responsible organization, financing, and commercialization of R&D products and technological services.
- Opportunities and potential for collaborating in joint development of projects, demonstrations of advanced technologies, and industrial training.

Presenters: Pablo Mulas, IIE
Francisco Guzman, IMP
Miguel Balcazar Garcia, ININ

9:30 **Presentation by U. S. Participants**

- US panelists will have an opportunity to discuss areas identified as priorities by the Mexican participants. particularly in areas in which the U.S. has ongoing R&D or technology demonstration activities.

Presenters: All U.S. panelists

10:00 **Question & Answer and Discussion Period**

The question and answer period will be open to all participants and audience members. Either written or oral questions will be accepted.

10:15-
10:30 **Closing Remarks & Conclusions by Moderators**

Report on the Science & Technology Seminar

I Primary Goal

Present and discuss methods of promoting private/public sector collaboration between the United States and Mexico to further science, technology development and transfer. Specifically to identify areas where the countries can cooperate to reach these goals of efficient and rapid scientific technology advancement.

II Areas of Potential Cooperation - Strong Endorsement

A. Natural Gas Extraction Technology

B. Heavy Oil Extraction Technology

C. Clean Fuels Development

D. Energy Efficiency/Renewables

E. End Use Process

F. Environmental Characterization and Remediation, and Pollution Prevention (both transboundary and global)

G. Nuclear Methods for Waste Destruction and Medical Applications

H. Energy Forecasting Models

III Methods of Achieving Cooperation

A. Information transfer

1. One-time access

2. The incorporation of all entities, including Universities, in the information loop to multiply the speed and efficiency of transfer.

B. Private and Public sector and cross country alliance.

IV The Leveraging of Technical and Scientific Advantage:

Namely, the usage of existing technology from one country to benefit the other. To draw on the competitive advantage of each country by sharing research and results to leverage mutual efforts. To further build upon the already available foundation and success between our two countries, involving universities early on within this process.

In other words, a cooperative short-and long-term effort to benefit both Mexican and North American (--United States--) interests and not reinvent any wheels.

A note on funding - These statements and their respective results will be largely dependent on the appropriate funding from both the standpoints of the U.S. and Mexico.

"Joint Implementation was also discussed as a mechanism for funding the demonstration of clean technologies".

V Next Steps

A. Both the Mexican and U.S. government agencies are interested in more closely coordinating and collaborating in applied energy R&D projects that involve the private sector of one or both countries.

B. Priority areas for collaboration include natural gas and heavy oil extraction technology, clean fuels development, energy efficiency and renewable energy, energy forecasting and data transfer, environmental characterization and remediation, and pollution prevention.

C. Participants from the workshop will quickly identify one or two projects with high probability for success in natural gas production or end use. They will seek support from DOE, PEMEX and industry, and will execute the projects.

D. The U.S. and Mexico will hold a follow-up workshop with participation by industry, PEMEX, IMP, IIE, UNAM, DOE/FE,/EE,/PO, and /ER to develop a plan for collaborative development and demonstration projects.

U.S. Department of Energy Mission to Mexico
Official Delegation

Ms. Nancy Mohn
Director Strategic Sales Analysis and Support
ABB Inc.
1000 Prospect Road
Windsor, CT 06095
ph: 203/285-5748
fax: 203/285-4900
Power Generation

Mr. Raymond Parker
President & CEO
Advanced Panel Manufacturer's, Inc.
700 River Avenue, Suite 223
Pittsburgh, PA 15212
ph: 412/231-8685
fax: 412/231-8819
Renewables

Mr. Robert J. Joyce
President
Ahlstrom Development Corporation
8925 Rehco Road
San Diego, CA 92121-3269
ph: 619/458-3000
fax: 619/457-0855
Power Generation

Mr. Charles Moore
Akin, Gump, Strauss, Hauer & Feld
1900 Pennzoil Place
South Tower
711 Louisiana Street
Houston, TX 77002
ph: 713/220-5800
fax: 713/236-0822
Finance

Mr. Joe Loper
Senior Research Associate
Alliance to Save Energy
1725 K Street, NW, Suite 509
Washington, DC 20006-1401
ph: 202/857-0666
fax: 202/331-9588
Efficiency

Ms. Doreen Chiu
President & CEO
Allied Technology Group
47375 Fremont Boulevard
Fremont, CA 94538
ph: 510/490-3008
fax: 510/651-3731
Service Companies

Mr. Armando Pena
Vice President - Finance
American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373
ph: 614/223-2850
fax: 614/223-2807
Power Generation

Ms. Susan Connell
Senior Vice President for Development
Amoco/Enron Solar Power Development
1400 Smith Street
P.O. Box 1188
Houston, TX 77251-1188
ph: 713/853-6685
fax: 713/853-8870
Renewables

6/28/95 01:09pm

Mr. John Thomas Wilson
Senior Vice President International
Anderman/Smith Overseas, Inc.
1776 Lincoln Street, Suite 500
Denver, CO 80203
ph: 303/839-5013
fax: 303/839-5076
Natural Gas

Dr. Merwin Brown
Associate Director, Energy Programs Directorate
Battelle, PNL
Battelle Boulevard
Richland, WA 99352
ph: 509/372-6323
fax: 509/375-3970
Service Companies

Mr. James F. Karwinski
Vice President, Financial Operations
Besicorp Group Inc.
1151 Flatbush Road
Kingston, NY 12401
ph: 914/336-7700
fax: 914/336-7172

Mr. Jon Pietruszkiewicz
Manager, Commercial Development
Bechtel
50 Beale Street
San Francisco, CA 94105
ph: 415/768-7688
fax: 415/768-0503
Renewables

Mr. Phillip Hilder
Bennett, Brooks, Baker & Lange
1700 Neils Esperson Building
808 Travis Street
Houston, TX 77002
ph: 713/222-1434
fax: 713/547-7000
Finance

Mr. Neil H. Schilmoeller
Manager, Corporate Business Development
Brown & Root, Inc.
4100 Clinton Drive
Houston, TX 77020-6299
ph: 713/676-4874
fax: 713/676-7487
Service Companies

Dr. Luis Sanchez-Barreda
Director, International Energy Resource Projects
Bureau of Economic Geology
University Station, Box X
Austin, TX 78713-8924
ph: 512/471-1534
fax: 512/471-0140
Energy Research

Mr. Bart Roe
Burns and Roe Enterprises
800 Kinderkamack Road
Oradell, NJ 07649
ph: 201/986-4055
fax: 201/986-4831
Power Generation

U.S. Department of Energy Mission to Mexico
Official Delegation

Mr. Andrew Mangan
Executive Director
Business Council for Sustainable Development
8303 Mopac Expressway
Suite 210, Room 240
Austin, TX 78759
ph: 512/794-8813
fax: 512/794-8815
Renewables

Mr. Brian Ward
Director, Business Development
Latin America Services
Cambridge Energy Research Associates
20 University Road
Cambridge, MA 02138
ph: 617/497-6446
fax: 617/497-0423
Energy Research

Mr. Manuel Pena-Morros
Director General
Chase Manhattan Bank, Mexico S.A.
Montes Urales 470 - 4 Piso
Colonia Lomas de Chapultepec
11000 Mexico D.F.
ph: 525/540-9700
Finance

Mr. Thomas E. Dodd
Vice President & General Manager
CNG Power Company
One Park Ridge Center
P.O. Box 15746
Pittsburgh, PA 15244-0746
ph: 412/787-4286
fax: 412/787-6159
Power Generation

Mr. R. Cary McNair
Vice President
Cogen Technologies Capital Company
1600 Smith Street, 43rd Floor
Houston, TX 77002
ph: 713/951-7739
fax: 713/951-7745
Power Generation

Mr. Carlos J. Bing-Zaremba
Vice President Project Development
Cogentrix Energy Inc.
9405 Arrowpoint Blvd.
Charlotte, NC 28273-8110
ph: 704/525-3800
fax: 704/529-5313
Power Generation

Mr. Donald M. Condon
President
Conoco Power
P.O. Box 2197
Houston, TX 77252-2197
ph: 713/293-3199
fax: 713/293-5019
Power Generation

Mr. Eddie Kolodziej, Jr.
Director of Business Development
CSW International
P.O. Box 660789
Dallas, TX 75266-0789
ph: 214/777-1430
fax: 214/777-3799
Power Generation

Mr. J. Morton Eggleston, Jr.
Manager - International Business Development
Dominion Energy
901 East Byrd Street, West Tower
Richmond, VA 23219
ph: 804/775-5876
fax: 804/775-5720
Power Generation

Dr. Phillip (Mike) Wright
President, Geothermal Energy Association
Earth Sciences & Research Institute
University of Utah
391 Chipeta Way, Suite C
Salt Lake City, UT 84108
ph: 801/584-4439
fax: 801/584-4453
Energy Research

Mr. Robert Eggleston
President
EFH Coal Company
89-153 Miller Street
West North End Station
Wilkes-Barre, PA 18705
ph: 717/823-7664
fax: 717/829-4515
Power Generation

Mr. Ray Cordova
Energy Project Development
El Paso Development Company
P.O. Box 1492
El Paso, TX 79978
ph: 915/541-2026
fax: 915/541-5427
Natural Gas

Ms. Nancy Bacon
Senior Vice President
Energy Conversion Devices
1675 West Maple Road
Troy, MI 48084
ph: 810/280-1900
fax: 810/280-1456
Renewables

Mr. Hector Gutierrez
Principal
Enron Development Corp.
333 Clay, Suite 1800
Houston, TX 77002
ph: 713/646-6135
fax: 713/646-6560
Natural Gas

Mr. Bill Weidler
Senior Vice President
International Business Development
ENSERCH Development Corporation
1817 Wood Street
Suite 50
Dallas, TX 75201
ph: 214/573-3169
fax: 214/670-2974
Power Generation

Mr. Walter Hesse
President and CEO
Entech, Inc.
P.O. Box 612246
DFW Airport, TX 75261
ph: 214/456-0900
fax: 214/456-0904
Renewables

U.S. Department of Energy Mission to Mexico
Official Delegation

Mr. Edgar Uribe
Director of Latin America Investment Development
Entrix
5252 Westchester, Suite 250
Houston, TX 77005
ph: 713/666-6223
fax: 713/666-5227
Service Companies

Mr. Richard Lindley
Vice President, Natural Gas Marketing
Fina Oil and Chemical Co.
P.O. Box 2159
Dallas, TX 75221
ph: 214/890-1844
fax: 214/750-2570
Natural Gas

Mr. Michael Gagner
Director of Latin America
Flowind Corporation
881 Ocean Drive, Suite 9E
Key Biscayne, FL 33149
ph: 305/361-1202
fax: 305/361-1997
Renewables

Dr. Robert Rosenberg
Interim Executive Director
Gas Technology Information Inc.
8600 West Bryn Mawr Avenue
Chicago, IL 60631-3562
ph: 312/399-8130
fax: 312/399-8170
Energy Research

Mr. John McCarter
Manager, Latin America Power Systems
GE Power Systems
Building 2, Room 115B
1 River Road
Schenectady, NY 12345
ph: 518/385-3563
fax: 518/385-9553
Power Generation

Mr. Ronald W. Brown
President
Gulf Gas Utilities Company
2450 South Shores Boulevard
Suite 205
League City, TX 77573
ph: 713/334-6335
fax: 713/334-5976
Power Generation

Mr. Jerry Brashear
Senior Vice President
ICF Kaiser
9300 Lee Highway
Fairfax, VA 22031-1207
ph: 703/934-3850
fax: 703/691-3349
Efficiency

Dr. Hamid Al-Rikabi
Vice President
Improved Petroleum Recovery Int., Ltd.
5525 MacArthur Blvd.
Suite 680
Irving, TX 75038
ph: 214/257-1900
fax: 214/257-1278
Natural Gas

Ms. Robin R. Neal
Executive Vice President
Integrated Services, Inc.
233 South Detroit
Tulsa, OK 74120
ph: 918/585-1437
fax: 918/587-1987

Mr. Humberto Vela
President
International Brokerage & Marketing
405 Plymouth
Laredo, TX 78041
ph: 512/723-9211
Finance

Mr. John Foster
Senior Vice President Acquisitions
International Generating Company
One Bowdoin Square
Boston, MA 02114-2910
ph: 617/589-9338
fax: 617/227-2690
Power Generation

Mr. Stephen B. Fleming
Senior Vice President -
International Business Development
International Ion Incorporated
223 N. Guadalupe, #304
Santa Fe, NM 87501
ph: 505/757-8404
fax: 505/757-6506
Finance

Mr. D.W. Kearney
Kearney & Associates
14022 Condesa Drive
Del Mar, CA 92014
ph: 619/481-8044
fax: 619/755-7348

Mr. Dale Osborn
Vice President
Kenetech
98 San Jacinto Blvd., Suite 320
Austin, TX 78701
ph: 512/472-1913
fax: 512/322-5550
Renewables

Mr. Porfirio (Pete) Espinosa
Project Manager
K&M Engineering and Consulting
Corporation
2001 L Street, N.W., Suite 500
Washington, DC 200036
ph: 202/728-0390
fax: 202/872-9174
Power Generation

Mr. Larry Silverman
Chief Executive Officer
Light Media Corporation
7016 Terminal Square
Upper Darby, PA 19082
ph: 610/734-1245
fax: 610/734-1263
Efficiency

U.S. Department of Energy Mission to Mexico
Official Delegation

Mr. John Vella
Vice President and General Manager for
Latin America
Mission Energy Corporation
18101 Von Karman Avenue
Irvine, CA 92715-1046
ph: 714/798-7935
fax: 714/833-9274
Power Generation

Mr. Joe Cloessner
Mitchell Energy
2001 Timberloch Place
The Woodlands, TX 77380
ph: 713/377-6164
fax: 713/377-5885
Natural Gas

Mr. Charlie Sheppard
Business Advisor
Mobil Exploration and Development
Latin America Inc.
12450 Greenspoint Drive
Houston, TX 77060-1991
ph: 713/775-2836
fax: 713/775-4187
Natural Gas

Mr. Justin Manson
Head of Mexico Coverage
Morgan Stanley & Co.
1251 Avenue of the Americas
48th Floor
New York, NY 10020
ph: 212/703-8784
fax: 212/703-8170
Finance

Mr. James J. Steele
President and CEO
Mosbacher Power Group
712 Main Street, Suite 2200
Houston, TX 77002-3290
ph: 713/546-2630
fax: 713/546-2595
Power Generation

Mr. Milt Honea
Chairman, President and CEO
Noram
P.O. Box 2628
Houston, TX 77252-2628
ph: 713/654-5931
fax: 713/654-5743
Natural Gas

Mr. Michael Gregory
Manager, Government and Public Affairs
North American Coal Corp.
14785 Preston Road, Suite 1100
Dallas, TX 75240-7891
ph: 214/239-2625
fax: 214/387-1031
Coal

Mr. David Martin
President and CEO
Occidental Oil and Gas Corporation
1200 Discovery Drive
Bakersfield, CA 93389
ph: 805/321-6317
fax: 805/322-6828
Natural Gas

Mr. Steve T. Janus
Offshore Gas Developments Ltd.
2127 E. 60th Court
Tulsa, OK 74105
ph: 918/742-0272
fax: 918/492-6237
Natural Gas

Mr. John T. Sickman
Vice President
Panhandle International Development Corporation
5400 Westheimer Court
Houston, TX - 77056-5310
ph: 713/627-5818
fax: 713/989-3185
Power Generation

Mr. Greg Vandiver
District Vice President - Sales
Peabody Coal Sales Co.
701 Market Street, Suite 830
St. Louis, MO 63101-1826
ph: 314/342-7649
fax: 314/342-7646
Coal

Mr. Rodger E. Collins
Regional Manager
Sales & Marketing
Raytheon Engineers & Constructors
13105 Northwest Freeway, Suite 200
Houston, TX 77040
ph: 713/329-4126
fax: 713/329-4896
Power Generation

Mr. Thomas Anderson
Senior Application Engineer - Latin America Sales
Reda Pump Co.
401 South Dewey
Bartlesville, OK 74003
ph: 918/661-2000
fax: 918/661-2101
Service Companies

Mr. Charles Duckworth
Manager-Planning Dept.
Salt River Project
Mail Station - ISB665
P.O. Box 52025
Phoenix, AZ 85072-2025
ph: 602/236-2678
fax: 602/236-6755
Power Generation

Mr. Ron Fuller
Vice President, Governmental and Regulatory Services
San Diego Gas & Electric Co.
101 Ash Street
P.O. Box 1831
San Diego, CA 92112-4150
ph: 619/696-4596
fax: 619/233-9202
Power Generation

Mr. Tom Cook
Saratoga Resources
11931 Wickchester
Houston, TX 77043
ph: 713/531-0022
fax: 713/531-0023
Power Generation

U.S. Department of Energy Mission to Mexico
Official Delegation

Mr. George Avery
Shaw, Pittman, Potts & Trowbridge
2300 N Street, NW
Washington, DC 20037-1128
ph: 202/663-8856
fax: 202/663-8007
Finance

Mr. T. Michael Dossey
Vice President - Deer Park Project Venture
Shell Oil Co.
910 Louisiana, 1 Shell Plaza
Houston, TX 77002
ph: 713/241-2174
fax: 713/241-3163
Natural Gas

Mr. Lynn Coleman
Skadden, Arps, Slate, Meagher & Flom
1440 New York Avenue, N.W.
Washington, DC 20005
ph: 202/371-7600
fax: 202/371-7945
Finance

Mr. Donald Carmel
Executive Director
Smith Barney, Inc.
388 Greenwich Street
New York, NY 10103
ph: 212/816-7340
fax: 212/816-7751
Finance

Mr. John K. Peterson
Vice President
Southern California Gas Co.
555 West 5th Street, Suite 2800
Los Angeles, CA 90013
ph: 213/244-3100
fax: 213/244-8291
Natural Gas

Mr. Manuel Cavazos
Executive Vice President
Southern Union Co.
504 LaVaca, Suite 800
Austin, TX 78701-2939
ph: 512/370-8229
fax: 512/370-8239
Natural Gas

Mr. Byron Washom
President
Spencer Management Associates
P.O. Box 724
Diablo, CA 94258-0724
ph: 510/743-9196
fax: 510/743-9197
Renewables

Mr. Roger Little
President
Spire Corporation
One Patriots Park
Bedford, MA 01730-2396
ph: 617/275-6000
fax: 617/275-7470
Renewables

Mr. Tom Ehrenberg
Consultant
Tejas Gas
1301 McKinney, Suite 700
Houston, TX 77010
ph: 713/658-0509
fax: 713/650-6231
Natural Gas

Mr. Jay Holcomb
Senior Vice President
Tenneco Gas Latin America
P.O. Box 2511
Houston, TX 77252-2511
ph: 713/757-3320
fax: 713/757-5514
Natural Gas

Mr. David Johnson
Manager, Business Development
Tesoro Petroleum Corporation
8700 Tesoro Drive
San Antonio, TX 78217
ph: 210/283-2409
fax: 210/283-2031
Natural Gas

Mr. Graham Batcheler
President
Texaco Natural Gas
P.O. Box 4700
Houston, TX 77210-4700
ph: 713/752-6102
fax: 713/752-4669
Natural Gas

Mr. Soll Sussman
Special Assistant to the Commissioner
Texas General Land Office
1700 North Congress, Room 620
Austin, TX 78701-1495
ph: 512/463-5039
fax: 512/463-5233
Power Generation

Mr. George Hutchinson
Managing Director
Trust Company of the West
1000 Louisiana Street, Suite 2175
Houston, TX 77002
ph: 713/615-7400
fax: 713/615-7460
Finance

Dr. Michelle Michot Foss
Director, Institute of Energy
University of Houston
College of Business Administration
Houston, TX 77204-6283
ph: 713/783-3512
fax: 713/783-5766
Energy Research

Mr. Thomas E. Fisher
Vice President
Unocal
1201 West 5th Street
P.O. Box 7600
Los Angeles, CA 90051
ph: 213/977-6278
fax: 213/977-6525
Natural Gas

U.S. Department of Energy Mission to Mexico
Official Delegation

Mr. Stan McLelland
Executive Vice President and General Counsel
Valero Energy Corp.
P.O. Box 500
San Antonio, TX 78292-0500
ph: 210/246-2016
fax: 210/246-2646
Natural Gas

Ms. Jane Hickie
Verner, Liipfert, Bernhard, McPherson & Hand
901 15th Street, N.W.
Suite 700
Washington, DC 20005
ph: 202/371-6133
fax: 202/371-6279
Power Generation

The Honorable Mike Andrews
Vinson & Elkins
1455 Pennsylvania Avenue NW
Washington, DC 20004
ph: 202/639-6536
fax: 202/639-6604
Power Generation

Mr. Ray Hutchison
Vinson & Elkins
3700 Trammel Crow Center
2001 Ross Avenue
Dallas, TX 75201
ph: 214/220-7922 or 202/544-2840
fax: 214/220-7716
Finance

Mr. Fernando de Larranaga
Mexican Region Representative
Watt Stopper
Arlington, TX
ph: 817/860-7327
fax: 817/860-2259
Efficiency

Mr. Tom Walker
Consultant
407 West 18th Street, Suite 116
Austin, TX 78701
ph: 512/476-9953

Mr. Randy Barnard
Director of International Business Development
Williams Field Services
1667 K Street, NW
Suite 800
Washington, DC 20006
ph: 918/588-4592
fax: 918/588-4173
Natural Gas

Secondary Company Representatives and U.S. Government Staff (non-DOE)

Mr. Daniel Bauch
Mexico Representative
Besicorp Group Inc.
1151 Flatbush Road
Kingston, NY 12401
ph: 914/336-7700
fax: 914/336-7172
Power Generation

Mr. Orlando A. Alvarez
Gas Supply Manager
CNG Energy Services Corporation
Four Greenspoint Plaza, Suite 1750
16945 Northchase Drive
Houston, TX 77060
ph: 713/873-1529
fax: 713/873-1530
Natural Gas

Mr. Juan Suarez Armora
General Manager
Latin America Development Engineering Office
Enron Engineering & Construction Company
333 Clay Street, Suite 400
Houston, TX 77002
ph: 713/646-6311
fax: 713/646-6271
Natural Gas

Mr. James R. Wittliff
Integrated Services, Inc.
233 South Detroit
Tulsa, OK 74120
ph: 918/744-4349

Mr. Salvador Gonzalez Luque
Director of Business Development - Latin America
Mission Energy Americas
18101 Von Karman Avenue, Suite 1700
Irvine, CA 92715-1046
ph: 714/798-7947
fax: 714/833-9274

Mr. Marcelo Marino
Staff Engineer
North American Coal Company
Signature Place II
14785 Preston Road, Suite 1100
Dallas, TX 75240-7891
ph: 214/239-2625
fax: 214/387-1031

Ms. Kate Brown Maracas
Manager - Environmental Affairs
Salt River Project
Mail Station PAB355
P.O. Box 52025
Phoenix, AZ 85072-2025
ph: 602/236-2045
fax: 602/236-3407

Ms. Lisa Urias
Senior Analyst International Markets
Salt River Project
Mail Station ISB666
P.O. Box 52025
Phoenix, AZ 85072-2025
ph: 602/236-2192
fax: 602/236-6755

Ing. Esteban Mendoza
Director
Electricity System Design and Construction
Salt River Project
P.O. Box 52025
Phoenix, AZ 85072-2025
ph: 602/236-8060
fax: 602/236-8030

Mr. Henry Havre
Skadden, Arps, Slate, Meagher & Flom
1600 Smith, Suite 4460
Houston, TX 77002
ph: 713/655-5100
fax: 713/655-5181

Mr. Ruben C. Ojeda
Executive Director - Mexico
Investment Banking Division
Smith Barney Inc.
388 Greenwich Street
New York, NY 10013
ph: 212/816-2271
fax: 212/816-7751

Ing. Ruben M. Mereles
President
Tenneco Gas - Latin America
Campos Eliseos 432
Mexico D.F. C.P. 11560
ph: 525/280-8271
fax: 525/280-8021

Ms. Elizabeth Richards
Design Assistance Center
Renewable Energy
Sandia National Laboratories
Department 6201 - MS0704
Albuquerque, NM 87185-0704
ph: 505/844-6951
fax: 505/844-6541

Mr. Richard Harding
Manager
Advanced Geophysical Technology Dept.
Sandia National Laboratories
Albuquerque, NM 87185-0705
ph: 505/844-0780
fax: 505/844-0240

Ms. Merriam Mashatt
International Trade Specialist
Office of the North American Free Trade Agreement
International Trade Administration
U.S. Department of Commerce
Washington, DC 20230
ph: 202/482-0305

Ms. Rebecca F. Schaffer
Director - Office of External Affairs
Federal Energy Regulatory Commission
825 North Capitol Street, NE
Washington, DC 20426
ph: 202/208-0004

Mr. Richard P. O'Neill
Director, Office of Economic Policy
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Room 9216
Washington, D.C. 20426
ph: 202/208-0100
fax: 202/208-1010

Mr. Stephen Witkowski
Deputy Director - Energy Efficiency Project
U.S. Agency for International Development
Office of Energy, Environment and Technology
1111 19th Street
Arlington, VA 22209
ph: 703/235-4950
fax: 703/235-4964

U.S. Delegates traveling to Monterrey

Wednesday Evening, June 21st

2:55p.m.	John Sickman	Panhandle International Development Corp.
p.m.	Joe Loper	Alliance to Save Energy
	John Holcomb	Tenneco Gas
	Ruben Mereles	Tenneco Gas
	Linda Trocki	Los Alamos National Lab
p.m.	Tom Wilson	Anderman/Smith

Thursday Morning, June 22nd

Mexicana Flight #7
Departure: 6:55am

Dr. Hamid Al-Rikabi	Improved Petroleum Recovery
George Avery	Shaw, Pittman, Potts & Trowbridge
Susan Connell	Amonco/Enron Solar
D.W. Kearney	Kearney & Associates
Ray Parker	Advanced Panel Manufacturers
Dr. Robert Rosenberg	Gas Research Institute
Larry Silverman	LightMedia Interactive
Byron Washom	Spencer Management Associates

AeroMexico Flight #230
Departure: 7:00am

Merwin Brown	Battelle, PNL
Manuel Cavazos	Southern Transmission Co.

Joe Cloessner	Mitchell Energy
Lynn Coleman	Skadden, Arps, Slate, Meagher & Flom
Don Condon	Conoco Power
Tom Dodd	CNG Power Company
Porfirio Espinosa	K&M Engineering & Consulting
Tom Fisher	Unocal
Jaime Garcia	GE Power
Michael Gregory	North American Coal Co.
Jane Hickie	Verner, Liipfert, Bernhard, McPherson & Hand
Milt Honea	Noram
Richard Lindley	Fina Oil and Chemical Co.
Barry McKay	Unocal
C. Cary McNair	Cogen Technologies
Marcelo Merino	North American Coal Corporation
Charles Moore	Akin, Gump, Strauss, Hauer & Feld, L.L.P.
Jon Pietruszkiewicz	Bechtel
Bart Roe	Burns and Roe
Soll Sussman	Texas General Land Office
Steve Witkowski	U.S. AID
Mike Dossey	Shell Oil Products

U.S. Delegation departures from Monterrey

Thursday, June 22, 1995

American #364 to Dallas
Departure: 2:45p.m.

Tom Dodd
CNG

Tom Fisher
Unocal

Ms. Jane Hickie
Verner Liipfert

Mexicana #?? to Mexico City
Departure: 3:00p.m.

George Avery
Shaw Pittman

R. Cary McNair
Cogen Technologies

Continental #472 to Houston
Departure: 3:25p.m.

Joe Cloessner
Mitchell Energy

Lynn Coleman
Skadden, Arps

Don Condon
Conoco

Mike Dossey
Shell

John McCarter
GE

Barry McKay
Unocal

Ken Parker
Advanced Panel Manufacturers

John Sickman
Panhandle Development

American #1272 to Dallas
Departure: 5:55p.m.

Hamid Al-Rikabi
Improved Petroleum Recovery

Merwin Brown
Battelle, PNL

Michael Gregory
Marcelo Merino
North American Coal

D.W. Kearney
Spencer Management

Richard Lindley
Fina Oil

Robert Rosenberg
GRI

Soll Sussman
Texas General Land Office

Byron Washom
Spencer Management Associates

John Thomas Wilson
Anderman/Smith

The U.S. Department of Energy Delegation to Mexico

Government Delegation

U.S.Department of Energy

William H. White — Head of Delegation
Deputy Secretary

Susan F. Tierney
Assistant Secretary for Policy

Peter Fox-Penner
Principal Deputy Assistant Secretary
for Energy Efficiency and Renewable Energy

Reggie Spiller
Deputy Assistant Secretary for Gas and Petroleum Technologies

Jack Carter
Senior Advisor to the Deputy Secretary for International Affairs

David Pumphrey
Director, Office of International

Bud Annan
Director, Office of Solar Energy Conversion

Don Juckett
Business Sector Manager for Natural Gas and Oil

Hank Santiago
International Affairs Specialist

Russ Profozich
Senior Economist, Office of Electricity Policy

Steve Lee
Senior Industry Analyst, Office of Energy Exports

Michael Moore
Special Assistant to the Deputy Secretary

Gary Ward
International Affairs Specialist

Beth Arner
International Programs Coordinator for Efficiency and Renewables

Ann Farace
Special Assistant to the Deputy Secretary

Bill Wicker
Public Affairs Specialist

Dawn Schrepel
Trade Mission Coordinator

Other U.S. Officials

Elizabeth Moler
Chair
Federal Energy Regulatory Commission

Dick O'Neill
Office of Energy Programs
Federal Energy Regulatory Commission

Rebecca Schaffer
Office of External Affairs
Federal Energy Regulatory Commission

Charles Meissner
Assistant Secretary for International Economic Policy
U.S. Department of Commerce

Merriam Mashatt
Office of International Economic Policy
U.S. Department of Commerce

Steve Witkowski
U.S. Agency for International Development

Elizabeth Richards
Sandia National Laboratory

Linda Trocki
Director, Office of Technology Programs
Los Alamos National Laboratory