

Republic of India

India: Policy Notes on Power

1. **Clean Energy Ministerial in April 2013 (and pre event Delhi Clean Energy Conference in December 2012)**
2. **Point of view on Gol request to provide comments on proposed additional legal provisions for performance review of electricity regulators**
3. **Review of new competitive bidding guidelines of GOI for power generating stations**

May 14, 2013

SASDE

SOUTH ASIA



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- 1. Clean Energy Ministerial in April 2013 (and pre event Delhi Clean Energy Conference in December 2012)**



Planning Commission
Government of India



THE WORLD BANK



The Energy and Resources Institute



SHAKTI
SUSTAINABLE ENERGY
FOUNDATION



Confederation of Indian Industry

CONFERENCE PROCEEDINGS





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Summary of Technical Sessions, DCEC 2012

Regulatory Instruments and Fiscal Incentives

- Which specific regulatory instruments and incentive mechanisms have worked well and have been relatively effective in developing countries?
- Given increasing shares of renewable based electricity, how should the next generation RE policy and regulatory instruments be designed, for more mature RE markets in developing countries?
- How can the implementation of the regulatory and policy framework be strengthened in developing countries?
- Should developing countries start with voluntary or mandatory codes and standards?
- How do we determine the stringency level of policy mandates such as feed in tariff levels or minimum energy performance standards or renewable energy purchase obligations that will be appropriate for developing countries?
- How can consumers be influenced to buy energy efficient appliances through appropriate pricing strategies and cost-effective behavioral interventions in developing countries?

Market Mechanisms

- What is the best way to price certificates/credits keeping in mind the policy uncertainties arising from turbulent global markets?
- What is the best way to leverage participation by the private sector in assisting market forces to capture the best possible technology deployment?
- How best can the exit strategy for regulatory interventions be defined so as not to distort the market in the long run?

Financial Mechanisms

- What are the most relevant financing mechanisms to scale up clean energy investments in the developing countries?
 - How does one most effectively design and implement public financing mechanisms for clean energy?
 - What is the best way to leverage private sector participation and investments through public and climate finance?
 - What are the major design adaptations that need to be made to financial solutions, successful in developed countries, before application in developing countries?
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Background

The Clean Energy Ministerial (CEM) is a high-level global forum to promote policies and programs that advance clean energy technology, to share lessons learned and best practices, and to encourage the transition to a global clean energy economy. At the United Nations Framework Convention on Climate Change conference of parties in Copenhagen in December 2009, U.S. Secretary of Energy Steven Chu announced that he would host the first Clean Energy Ministerial to bring together ministers with responsibility for clean energy technologies from the world's major economies and ministers from a select number of smaller countries that are leading in various areas of clean energy. Currently, the 23 governments participating in CEM initiatives are Australia, Brazil, Canada, China, Denmark, the European Commission, Finland, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Norway, Russia, South Africa, Spain, Sweden, the United Arab Emirates, the United Kingdom, and the United States, and collectively account for 80 percent of global greenhouse gas emissions and 90 percent of global clean energy investment.

The CEM initiatives are based on areas of common interest among participating governments and other stakeholders, focused on three global climate and energy

policy goals: Improve energy efficiency worldwide; Enhance clean energy supply; and Expand clean energy access.

India is going to host the fourth CEM (CEM4) in April 2013. The theme of CEM4 is **"Technology and Business Innovation."** Ministers from more than 20 participating countries will gather to discuss progress made by the CEM's clean energy initiatives, explore ways to enhance collaboration between participating governments, and develop strategies to drive public-private engagement to support clean energy deployment.

Following up on a specific request from the Government of India, a 2-day Pre-CEM4 **Clean Energy Conference** was organized on 11 – 12 December 2012 at The Park Hotel, New Delhi. The primary focus of the conference was on showcasing progress in BRICS and MIS countries, and developing a roadmap for scaling up implementation best practices in the area of clean energy policies and financing, along with support from other member countries of the CEM. The Delhi Clean Energy Conference 2012 was organized by the Planning Commission, The World Bank, TERI, Shakti Sustainable Energy Foundation, Confederation of Indian Industry (CII) and its Centre of Excellence for Sustainable Development.

Inaugural



Inaugurating the Delhi Clean Energy Conference 2012, Dr. Farooq Abdullah, Union Minister for New & Renewable Energy, Government of India said that “India has made considerable progress in production of solar, hydro, wind, geothermal and other forms of clean energy and it needs to be harnessed.” He talked about the high cost involved in developing and distribution of renewable energy but assured that with the 12th plan, generation based incentives will be provided to all stakeholders.

Implementation of Jawaharlal Nehru National Solar Mission will also help in cutting the cost involved in production of solar energy. Minister added that we need to revamp the hydropower technology, thereby enhancing the efficiency of turbines. He concluded stating that all countries need to come together to promote clean energy.



Delivering the keynote address, Suresh P Prabhu, Former Union Minister and Director, Shakti Sustainable Energy Foundation, said



he is delighted to see large number of participants across the globe coming together through this Clean Energy Forum to promote the policies and programs leading to clean energy. He focused on how energy can be used in terms of demand side management through market based mechanisms.



Onno Ruhl, Country Director-India, World Bank welcomed the participants and said that, there is an increasing need to support the world's primary energy supply which will grow by about 45% in the period 2006-2030, requiring some US\$26trillion investment. Almost 90% of this growth is expected to occur in developing countries, and more significantly, in urban areas. A diverse range of clean energy technology in renewable energy and energy efficiency exist that are commercially-viable and could cost-effectively address the challenges of energy access, energy security and climate change mitigation. People need energy to grow and the lower middle income countries have greatest needs and potential.



Steven Chu & Mr. David Sandlow, from US Department of Energy through their video address, said that the Clean Energy Ministerial is optimistic in looking forward towards a global clean energy economy.



Krishan Dhawan, CEO, Shakti Sustainable Energy Foundation concluded the session and delivered a vote of thanks.

During the session the Hon'ble Minister Farooq Abdullah with other dignitaries on the dais, released the technical background paper for Delhi Clean Energy Conference 2012.



The conference had representation from an impressive array of technical and policy specialists from over a dozen of countries. Over the two days, they discussed the

developments on renewable energy and energy efficiency and showcasing the best practices in different aspects of policies, technology and financing in these areas.





Opening Session: Promoting Clean Energy Technology and Business Innovation

The opening session on Clean Energy Technology & Business Innovation had array of experts including Ibrahim Rehman from The Energy Resources Institute; Kevin Nassiep from SANEDI, South Africa; Pashupathy Gopalan, Managing Director, SunEdison; Maria Cecilia Vieira from the Embassy of Brazil & Graham Pugh from US Department of Energy. The keynote address was delivered by B.K Chaturvedi, Member (Energy), Planning Commission, Government of India.

B K Chaturvedi, Member, Planning Commission appreciated the efforts and initiative in organization of DCEC 2012. He said that there is a need for enhanced focus on clean energy issues as the energy demand is going to increase by 1/3rd of its present value by 2015. He emphasized on the integration of low carbon growth strategy to reduce the global carbon footprint.

Ibrahim Rehman from TERI focused on issues related to energy access, cooking and lighting in rural areas. He elaborated on TERI's initiatives, like "Light a billion lives" that provides access to improved cooking stoves. While he strongly favoured that technology and business innovation is the key, he maintained that greater access would not ensure greater availability. He also emphasized that policy makers and the aid agencies should focus on innovations in the



last mile. "The Government of India should act as a catalyst rather than an implementer", he added.



Kevin Nassiep from SANEDI, South Africa focused on clean energy initiatives being practiced in South Africa at present and how energy efficiency initiatives can drive the transition towards the low-carbon economy. This is globally recognized as a competitive and development priority, but with the understanding that this will require far-reaching changes in technology, finance,

policy, implementation and societal behaviour. He also talked about resource efficiency and that it represents the most cost effective, sustainable means of creating a pathway to a low carbon future in isolation. This will require the ability to optimize, integrate, innovate and form strategic partnerships.



Maria from the Brazilian embassy talked about Brazil's transition to a low carbon economy. Her valuable inputs helped give an insight into the various bio-energy and hydro power focused renewable energy initiatives that have been successful for the Brazilian economy.

Pashupathy Gopalan from SunEdison stressed on the fact that solar energy interventions are leading a global energy transformation and the fact that this energy can be used for inclusive development. In the context of rural India, the solar micro-grids can provide many benefits to the community. SunEdison has already implemented such an initiative in 29 villages in Madhya Pradesh, India. They have been successful in deploying micro grids, battery backed systems, T&D network, prepaid metering



system with remote management through GSM. Their initiatives have also been instrumental in providing access to power for 8,000 houses and shops and eradicating darkness for over 40,000 residents. There are talks of up scaling these initiatives in other countries also, e.g. diesel abatement for IPPs in Cambodia, rural electrification and promotion of income generation activities in Rwanda and other African countries.



Graham Pugh from US Department of Energy talked of the Clean Energy Ministerial under CEM4 to be held in Delhi in April, 2013. The 21st Century power partnership is a multilateral effort of the Clean Energy Ministerial (CEM) that would accelerate the transition to clean, efficient, reliable and cost-effective power systems. It serves as a



platform for international efforts to advance integrated policy, regulatory, financial, and technical solutions for the deployment of renewable energy in combination with large-scale energy efficiency and smart grid solutions. The core elements of 21CPP are global expertise, public-private collaboration, peer-to-peer learning and integrated systems approaches.

The specific challenges that the implementation of such an initiative would face are legal, market, and institutional barriers. Increasing power system flexibility may require significant ecosystem-wide changes. Coordination could be a challenge due to the involvement of multiple agencies and jurisdictions, developing and implementing a shared vision is critical.



Getting public support could be challenging, as they may not understand or support necessary actions. Customizing solutions is a challenge as there is no one-size-fits-all solution; countries need to determine the most appropriate combination of approaches.



Technical Session 1: Renewables for Sustainable Energy Development

The first technical session of the Delhi Clean Energy Conference, 2012 was chaired by G.B Pradhan, Secretary, Ministry of New and Renewable Energy, Government of India. The distinguished panelists for the session included, Choi Bong Seok from Korean Energy Economics Institute, Korea; Jayant Sathaye, Senior Scientist and Strategic Advisor, Founder, International Energy Studies Group, Lawrence Berkeley National Laboratory; Maria Paatero-Kaarnakari, Senior Vice President, Fortum Asia, Finland and Ramesh Kymal, Managing Director, Gamesa, India.

The opening remarks from Mr. Pradhan were highly encouraging. He applauded the Jawaharlal Nehru National Solar Mission and highlighted that it was the first serious attempt to ensure energy security for the country and bringing about sustainable and environmentally efficient growth through large scale deployment of on-and off-grid solar power applications. The aim of that first clean energy initiative was to place India at the forefront and to help it emerge as a manufacturing base. The mission envisages to install over 20,000 MW of grid-connected solar power and another 2,000 MW of off-grid solar power from 2010 – 2022. The first phase was proposed to run for 3 years, the second phase for 4 years and the third phase for 5 years, thus making this a 12 year,

3-phase effort. He mentioned that the first phase is managing to achieve moderate targets by 2013 and the whole mission is on track so far the numbers are concerned. The state governments have now taken charge with a few of them taking out their own solar policies. The second phase would begin on April 1, 2013 and would go on till 2017. The flexible goal of the second phase would manage to achieve around 4000 MW of grid connected power, 800 MW of off-grid power and 7.5 million sq. meters of thermal collectors. By the end of 2022, there are expected to be 10 million households using solar lighting systems.

The ministry also deployed an element of reverse auction to innovate the process of allocation. This had to be done in conjunction with the tariffs set by the central regulator which was very high. He asserted that they were able to bring the tariffs down substantially. The mandate of this mission was to achieve grid parity for solar power by 2017, the end of the first phase. Although right now, the average is around Rs. 8.33 per unit, by 2017, grid parity shall be achieved.

Mr. Pradhan also mentioned that the phase 2 would lay a greater emphasis on solar photovoltaics (PVs) since India is gaining experience on the solar field as well there is an increase in the number of players in the



market. There is a growing interest amongst the public due to capacity building initiatives within the scientific and technical institutions. The introduction of solar and photovoltaics in the syllabi of these institutions would ensure that there is a ready-made pool of experts on the subject by the time we complete the mission.



Choi Bong Seok from Korean Energy Economic Institute talked about the renewable energy trends in South Korea. He stressed on how renewable energy sector has helped SMEs grow, create jobs and in-turn contribute to the national economy.

The private sector investment in the renewable energy sector in South Korea increased from \$774 million in the year 2007 to around \$ 3.1 billion in year 2010 and is further expected to go up to \$ 3.8 billion. The country has set a target of converting 11% of their total energy production to renewable energy by the year 2030, hence reducing greenhouse gas emissions by a significant level.



He concluded by emphasizing that Korea has a competitive advantage over other countries with regard to the implementation of renewable energy. The factors that lend South Korea an advantage over the rest of the world are its technical capabilities coupled with industrializing capacity. It also has strong government support policies to promote renewable energy.

The next panelist, Jayant Sathaye, Senior Scientist and Strategic Advisor, Founder, International Energy Studies Group, Lawrence Berkeley National Laboratory focused on BASIC countries. Dr. Sathaye talked about Policies and Programs for overcoming Renewable Energy (RE) Challenges in BASIC countries. He elaborated on the paths undertaken by China, Brazil & India to incentivize renewable energy deployment.

In China, more than 80% of the country's renewable energy capacity has been built by State Owned Enterprises (SOEs) and their subsidiaries. Companies enjoy financing through government guarantees on debt and access to low-cost government funding through related SOEs. Manufacturers,



provincially-owned companies, and foreign joint ventures represent much of the remaining RE deployment.

Brazil has been successful in encouraging RE investment through low-cost, long-term debt financing at large-scale. National Social Economic Development Bank (BNDES) dominates the overall long-term debt market in Brazil. It was noted that BNDES issued twice the loans in 2011 in Brazil as World Bank did globally. This helped in cutting RE costs in Brazil by as much as one fifth. Brazil's market-based, democratic system is generally analogous to India's, and Brazil's success in promoting renewable energy investment may be very relevant for India.

Ramesh Kymal, Managing Director, Gamesa, India said that renewable energy seems to be the best solution in present scenario. There are various incentives for renewable energy adoption as it would provide more access to power and would reduce the cost. In our country, around 40% of the population lacks access to electricity. The generation capacity can be increased using the renewable energy methods. This can also help us achieve the targeted 10% economic growth rate in the next 25 years.

Centralized approach to sustainable development is required with making all development initiatives like infrastructure development also energy intensive. If the expected growth rate is achieved, this can emerge as a new sector that could provide access to electricity, generate more jobs, reduce the electricity cost etc. These impacts would also benefit the environment in the long run and lead to environmental sustainability.

The Ministry of New and Renewable Energy is formulating an action plan for deployment of renewable energy in India. This action plan would take into account, potential risks and the contribution of this sector to the country's economic growth. A shift in subsidies would provide a significant impetus to the growth of this sector. The irrational taxation system with distorted prices needs to be revised. There is an urgency for us to adopt clean, energy efficient technology to ensure sustainability of the planet.



Maria Paatero-Kaarnakari from Fortum Asia, Finland introduced the concept of CHP- Combined Heat and Power production as a sustainable energy efficient solution. This mechanism of CHP entails simultaneous



generation of usable heat, cooling and electricity in a single process. As a result, the steam is used after a backpressure turbine for industrial processes or producing heating or cooling instead of dissipating it with the cooling water into the environment (as waste). Typical power to heat production ratio varies from 30-50% depending on the selected technology whereas CHP can reach up to 90% of primary energy efficiency.

In the case of industrial CHP plants, the steam can be extracted in different stages from the turbine and used as process heat in required pressure levels. CHP facilities can be found in almost all manufacturing industries, in India. CHP (cogeneration) is currently typically found at the sugar industry. It is small scale electricity production in comparison with traditional thermal condensing plants for electricity production.

CHP has proven a sizeable potential for increasing energy efficiency, that would benefit all parties involved including the environment, the state, the local communities and industry. Recent court rulings in a few Indian states have freed captive CHP plants using conventional fuel from RPO obligation, i.e. considered CHP similar to production based on renewable energy.



Technical Session 2: Catalyzing Transformation of Appliance and Lighting Markets



The session on Catalyzing Transformation of Appliance & Lighting markets was chaired by Pramod Deo, Chairperson & Chief Executive, Central Electricity Regulatory Commission, Government of India. The panelist included Jyoti Arora, Joint Secretary, Ministry of Power; Kaoru Yamaguchi, Manager, New & Renewable Energy Group, The Institute of Energy Economics, Japan; Christine Egan, Executive Director & CEO, Collaborative Labeling and Standards Program (CLASP); Ashish Khanna, Lead Energy Specialist, World Bank, India and Tae Won Moon, EnMS. Energy Efficiency Division, Korea.

Dr. Pramod Deo is the longest serving electricity regulator in India. He gave an insight into the various energy efficient initiatives undertaken by the Indian government.



Jyoti Arora, Joint Secretary, Ministry of Power discussed initiatives like Super-Efficient Equipment Program (SEEP) and Bachat Lamp Yojana (BLY). In the Indian context, there are 13 labeled appliances. Of these, 4 are mandatory appliances: frost-free refrigerators, air conditioners, tube lights and distribution transformers. Savings due to the Standards and Labeling program have avoided an installed capacity of over 7500MW during the Eleventh Plan period.





It has been observed that the average Energy Efficiency Ratio (EER) of air conditioners sold in India has increased from 2.2 in 2006-07 to 2.8 in 2011-12. The average consumption of a 300 litre frost free fridge declined from 547kWh per year in 2006-07 to 368kWh per year in 2011-12. Appliances like lamps and fans are price sensitive and thus market transformation is difficult only through this programme. Other programmes were initiated to identify the best technology practices. These were Bachat Lamp Yojana (BLY) and Super-Efficient Equipment Programme (SEEP).

Other appliances like fans can provide a unique opportunity for India. Ceiling fans have proven to be super efficient appliances with their efficiency being as low as 35W, compared to current load of 70W. The market for total electric fans is estimated to be growing at an annual rate of 12%, with domestic sale of ceiling fans being around 25 million in 2010.

The market share for 1200mm fans and the target under this intervention, is more than 67%. SEEP will promote technological interventions by the manufacturers. Reduction in appliance consumption has private benefits by reduction in energy costs, utility peak demand reductions and global carbon reductions.

Based on the experience from SEEP for ceiling fans, other appliances like refrigerators, agricultural pumps, TVs etc. may be promoted. Government will act as an aggregator for the demand of appliances for

market transformation for more affordable energy efficient appliances through LED light distribution to BPL households, public procurement of energy efficient appliances through DGS & DSEEP & BLY are successful examples of Public Private Partnership with strong public policy support.



Yamaguchi from The Institute of Energy Economics, Japan discussed about the successful labeling programme in Japan in response to increasing energy consumption in residential and transportation sector. The top runner programme helps in facilitating information flow to the consumers by labeling each appliance. Some labels are by the retailers and some are for the retailers.

The policy implications of this successful labeling program helped in targeting, integration of new technology, involvement of market players etc. The international market could be tapped for the same technology by scaling up the accepted domestic trends.

Christine Egan, from Collaborative Labeling and Standards Program (CLASP) believes that standards and labels work together to push and pull the market toward greater



energy efficiency. These standards and labeling programs impact the environment by reducing the energy consumption of a product, reducing the overall energy consumption. This reduces the power demand and the need to produce more electricity. This phenomenon would decrease the greenhouse gas emissions thus increasing the feasibility of renewables.

The implementation of Standards and Labeling (S&L) programs by various countries helps them to reduce capital investment in the energy supply infrastructure by making the renewable energy more affordable by reducing the need for energy production. This helps to avert urban/regional pollution and to promote competitiveness of domestic manufacturers by avoiding non-tariff trade barriers.

Standards and labels must be continually reviewed after a gap of every three to five years and also revised to increase stringency and drive continued energy savings. As new energy saving technologies are developed and become more cost effective, it is important to continually update the stringency of standards. Once the market

has become too saturated with high energy efficient products it is necessary to increase the stringency of labels in order to keep labels meaningful to consumers.

The Collaborative Labeling and Appliance Standards Program's (CLASP) primary objective is to identify and respond to the assistance needs of S&L practitioners around the world while making the highest quality technical information on S&L best practice available globally. CLASP has provided S&L technical assistance in over 50 countries in 6 continents, including Australia, Brazil, Egypt, Fiji, Ghana, Korea, Poland, South Africa, Thailand, Tunisia, Uruguay, and Vietnam.



Ashish Khanna from World Bank, India highlighted the role of lighting in energy security & climate change mitigation. According to the data, 19% Global Electricity Consumption is used for lighting. The total cost of lighting amounts to \$500 billion annually. Nearly 70% of electricity is used by lamps for which better alternative is available that can help reduce the energy consumption by almost 40%.



Initiatives like Mexico EE Lighting & Appliances Project and Mexico – CFL-Based Utility DSM Program have been able to achieve the estimated targets successfully. CFLs/ LEDs are one of the “low hanging” efficient technology options, but transaction costs could be quite substantial. Avoiding electricity shortages and power cuts is the primary objective of this programme while climate change mitigation is a far sighted objective. This drives the expanded CFL use and its application in developing world. Out of 45 million CFLs, free distribution of around 1.4 million CFL pilots were successful and 10 million carbon credits CERs (through 2021) are accepted to be generated.

The factors making this initiative successful are strong ownership and commitment of the Government, simple design, strong planning oversight and record keeping, effective coordination and consistency amongst stakeholders, involvement of a variety of level stakeholders (school teachers and local community leaders, and administrators), consumer awareness, quality technical specs (pertaining to local conditions & power characteristics). To ensure a continued use of CFLs, there needs to be an assured availability of high quality CFLs at an affordable rate.

The session concluded on the note that parallel regulatory and policy efforts are important along with the removal of disincentives (e.g. higher VAT and customs duties on CFLs). These initiatives should be supported in order to improve sustainability by strengthening the existing or establishing

new domestic CFL performance testing laboratories, establishing CFL Waste Recycling and/or End-of-Life Management Programs and strengthening or establishing local CFL Manufacturing Base.

Tae-won-Moon from Energy Efficiency Standardization & Certification Center, KEMCO talked about the growing trend of LED lighting across the world. He gave examples from Korea, Japan & China which had resulted in energy saving.



He concluded his presentation stressing on the mandatory use of Energy Efficient Appliances by Public Organizations while making new purchases or replacing existing appliances to encourage the change in the consumer behaviour. He also stressed on the fact that all public organizations must replace more than 30% of their lighting equipments with LED products by 2013.

Dr. Deo concluded the session by focusing on changing the consumer behavior. In India's case the Standards and Labelling Programme along with the Energy Efficient lighting programme have worked for very different reasons. The rural areas in India

pose a lot of challenges, especially in the case of fluorescent lamps that cannot work in those areas owing to low voltages. People are becoming more and more aware of the advantages of using energy efficient appliances. The regulators would play the most important role in the participatory process as it is a market driven trend.





Technical Session 3: Fostering Clean Energy through Market Mechanisms

The session was chaired by P Uma Shankar, Secretary, Ministry of Power, Government of India. The panelists were Saurabh Diddi, Energy Economist, Bureau of Energy Efficiency, Ministry of Power; Greg Briffia, Team Leader – Climate & Development, Energy, Climate & Growth Unit, British High Commission/DFID, India; G.C Datta Roy, Chief Executive Officer, Development Environenergy Services Limited (DESL); Nicole Thomas, Counselor - Resource, Energy and Tourism, Australian High Commission; & Seema Arora, Executive Director, CII-Centre of Excellence for Sustainable Development.



P Uma Shankar, Secretary, Ministry of Power opened the session stating that the energy needs are to be met keeping in view the fact that we need to tackle climate change and reduce carbon dioxide emissions. This can be done by introducing various laws, regulations or price mechanisms. The market mechanisms are an important tool to address

this issue as the consumer demand is not expected to go down." He also stressed that the increasing energy demand can only be met by increasing energy efficiency and the share of renewable energy.



Saurabh Diddi from Bureau of Energy Efficiency gave an introduction to PAT which stands for Perform, Achieve, Trade. This is a market based mechanism, which enhances the cost effectiveness in improving the energy efficiency in energy intensive industries through certification of energy saving which can be traded. Till date, the market mechanisms have been facing innumerable challenges because of their voluntary nature and the project based approach without a measured and verified baseline. The elements of PAT include target setting based on gate to gate specific energy consumption (SEC) wherein, each designated consumer has to reduce SEC in target year (2014-15) as compared to

baseline year (2009-10). The percentage reduction is based on efficiency in baseline year. The second important element is Monitoring and Verification wherein, the designated consumers monitor and record their energy purchases and product sales with the data provided to SDAs and BEE. The data will be verified by accredited energy auditor and verification is checked on a sample basis.

The other elements are incentivization and trading of excess savings and penalty for non-compliance. Energy Saving Certificates will be issued for savings in excess of target and these certificates can be traded with other designated consumers who can utilize them to show compliance. These certificates can also be banked for one more cycle. The trading platform will be provided by two power exchanges (IEX & PXIL). The penalty for non compliance is the energy cost of quantum of non compliance. Quantum of non compliance is provided in verification report and penalty is adjudicated by the state electricity regulatory commission. When converted, the energy cost amounts to Rs 10,154 per ton (2011-12), that shall be periodically updated. PAT would provide the Indian carbon market many advantages over the existing market mechanisms. Some of them are normalization, resolution of issues and providing coverage for the next cycle.

Greg Briffia from Department for International Development, DFID gave the attendees a scenario of energy efficiency in the U.K. Through his presentation, he introduced the idea of household energy



efficiency in Great Britain. At present, the U.K has implemented legally-binding carbon and fuel poverty targets. The mandate of a carbon market to be consumer friendly is to offer subsidies to the consumers. If the consumers do not have a choice in the market, the market is rendered useless. The concept of Green Deal was launched in order to address these issues. It has managed to introduce a new delivery landscape in the U.K carbon market. It looks at household repayments for energy efficiency measures through energy bill. The Green Deal Advice Report and Green Deal Plan have led to repayments being no higher than energy savings.

Another measure adopted by the U.K is The Energy Company Obligation (ECO) which will provide support for harder-to-treat properties. It is also expected to provide insulation & heating for low income households. The Government sets outcomes, therefore enabling carbon & fuel bill savings. These outcomes are consistent with the new EU Energy Efficiency Directive. Suppliers with fewer than 250,000 customers are exempted from this obligation. Funded by obligated energy suppliers, it is estimated to cost £1.3 billion per year. It is also expected to



stimulate market and boost the current low carbon economy.



G.C Datta Roy from Development Environergy Services Limited (DESL) discussed about the clean energy market-drivers, relevant learning from the Energy Service Company (ESCO) business and leveraging ESCO Learning for driving PAT in Indian markets. DESL has so far implemented some initiatives which have enabled energy saving of approx 200 MW in commercial buildings, industries and municipal facilities. In order to tap the biomass energy market, DESL has designed and engineered over 500 MW of biomass based power plants and their cogeneration.

They have also designed and engineered 22 MW waste to energy plant. He concluded the session with the following pointers. He emphasized on PAT Scheme-potential for transformational impact on EE Market. Learning from the ESCO process can be leveraged to meet some of the challenges successfully. He stressed that the 1st PAT cycle would require all of us to go through a learning journey in terms of technical, commercial, financial, administrative and

business process learning. He stressed on the need for fostering a strong collaborative process for success.



Nicole Thomas from the Department of Resources, Energy and Tourism, Australia discussed Australia's commitment to emission reduction targets, i.e. by 2020 which is 5 per cent below 2000 levels. The proposed reduction is 80 per cent below 2000 levels by 2050. He emphasized the market's role by the fact that market will drive the pace and shape of Australia's energy transformation. Market-based approaches will provide a signal to guide investment decisions by the private sector, allow the energy sector to adjust to technological changes and to deliver outcomes in the lowest cost and in most efficient manner. In the Australian context, the commitment is to Renewable Energy Target (RET), Clean Energy Future Plan, Carbon Pricing Mechanism and the Emission Trading Scheme (ETS).

At present, 335 renewable energy power stations are operational in Australia with a \$10.5 billion investment in large scale renewable energy power stations. The

compliance level by wholesale electricity purchasers is nearly 100 per cent. Currently 10% of Australia's electricity is being supplied by renewables. The Australian economy is currently in a transition from fixed Carbon Price to an Emissions Trading Scheme (ETS). From 2015, the Australian emission trading scheme will be linked to the European Union Emissions Trading System, producing the world's largest carbon market. He emphasized that a full two-way link will commence no later than July 1, 2018.

Seema Arora from CII-Centre of Excellence for Sustainable Development stressed on the need for energy efficient green buildings. She mentioned several projects like the Green Building Initiative led by CII which have achieved the target of reduced emissions. She also emphasized on the need for private sector involvement in clean energy initiatives as data suggests that only public funds are not sufficient to achieve the projected targets. While the global energy demand is expected to grow by more than one-third over the period to 2035 with China, India and the Middle East accounting for 60% of the increase. The climate scientists stress on the fact that to avert the worst consequences of climate change, the increase in global temperature should be limited to 2°C (or 3.6°F).

As estimated by the International Energy Agency, the total investment required to avoid dangerous climate change globally, is more than USD 1 trillion per annum. The developed countries have committed to raising USD 100 billion per year by 2020 to



help emerging nations mitigate climate change. Most of this investment needed to facilitate a low carbon transition has to come from the private sector. The private sector will need to play a central role in mobilizing this investment. Even if this level of financing is raised, public expenditures alone will be insufficient. This can provide leverage for a much larger private investment for clean energy initiatives. Developing countries will be most advantaged if public finance contributions are designed to maximize the leverage of additional private finance.

Despite these high pledges, it is not clear-cut how countries will make this level of capital available. It is clear that the private sector will have a key role to play in financing the sector. It is estimated that existing contributions to developing world climate-change investment total around USD 9 billion per annum, less than 2 per cent of USD 475 billion. The World Economic Forum (WEF) estimates that the sum of climate-related public sector commitments currently under negotiation, even if delivered to their maximum ambition, totals around USD 110 billion. The shortfall is potentially more than USD 350 billion. She concluded by saying, "We can speed up



the national investments in clean energy initiatives by building enabling environments and directly leveraging higher flow of private capital into pro-poor low-emission climate-resilient development."



Technical session 4: Regulatory Policy and Institutional Mechanisms

The session was chaired by Philippe Benoit, Energy Efficiency and Environmental Division Head, International Energy Agency. He talked about the needs of energy security focusing on the availability and affordability of clean energy which is fundamental as well as challenging. He said that there is a need to look at the complementary interventions like regulations, right mix of policies along with market mechanisms.



The other panelists in the session included Gwen Andrews, Vice-President Power & Environment Policy, Alstom; R.N. Prasher, Chairman, State Electricity Regulatory Commission, Haryana, and Pentti Puhakka, Chief Counsellor Energy Department, Ministry of Employment and the Economy, Finland.

The session started with the enhancement of public private partnerships for green growth where Gwen Andrews from Alstom



mentioned that policy makers have come to realise that public funds are insufficient to manage the transition to green growth that the world needs to make. Instead, public funds should be used to leverage a much larger amount of private sector funding into investments that will enable green growth. And the way to do that is to de-risk those investments. She mentioned about expertise of Alstom in transmission of power as well as in generation as the power market has a clear and pressing need for cleaner development. Moving into smart grid market with products such as automated systems and controls, and platforms for demand side response, Alstom also has the capacity to build service systems that allow real time competitive markets in electricity, which is a major reform that many countries are pursuing according to their own circumstances. Their clean energy strategy is based on environmental sustainability through the reduction of footprints, affordable electricity for all



nations, and increasing the reliability and flexibility of power generation. Alstom invested almost US\$ 1 billion in research and development of its technologies like advanced gas turbines, on and offshore wind turbines, carbon capture and storage, ocean energy, very high voltage transmission, smart grids, rolling stock for metros and high speed locomotives. E.g: Manufacturing plant for steam turbines and generators, boiler component factories and new rolling plants in India; wind turbine factory in Bahia province, Brazil; development of hydropower R&D facility in Tainjin, China; Geothermal business Mexico; Boiler factory in Surabaya, Indonesia; and an upcoming gas fired generation servicing hub in Vietnam. These investments also create jobs, develop local supply chains and industrial capacity, and often result in technology transfer.

Governments must adopt policies to facilitate investment in clean energy and clean development, and those policies should be predictable based on a strong and long term vision, well designed to support technology development, deal with non financial barriers as well as financial, and assurance of fair access to transmission and distribution. Even there is a need to align the efforts of the public and private sectors in scaling up and delivering rapidly on the need for clean development. In this effort, risks are allocated to those best placed to manage and mitigate them. Policies are the biggest risk and it is easy to identify responsibility in sharing the risk as governments are traditionally responsible for policies while the private sector is responsible for developing

technologies. Public and private sectors must learn to work together much more closely as private companies can contribute to capacity building relating to their particular industries and the public sector can play a broader role in skills development and education, and in ensuring that appropriate institutional structures are in place. Although the private sector is well practiced in matters of commercial application and financing, the public support for clean energy technologies is required before they can become fully competitive with fossil fuel technologies. There are a number of instruments available to help mitigate financial risks like carbon pricing and/or feed in tariff approaches provide basic support for technologies with a higher cost of delivered electricity. Capital costs and profitability can be assessed against the long term financial support afforded by these mechanisms.

R.N. Prasher from Haryana State Electricity Regulatory Commission, in the next presentation gave his views on the Regulation Issues in Green Energy.



He addressed that law is always dynamic and the Power Sector with its rapidly evolving

demand, supply and technology scenarios is even more dynamic.

This sector has huge impact on society as it connects the lives of people in terms of GDP, employment, health, education and comfort. Earlier, amendments to a Law have been considered necessary but now perceptions have changed. The difference of Central Electricity Regulatory Commission (CERC) Regulations and the State Regulations show the perception differences between the State Sector and the Central Sector. CERC could adopt liberal norms for the Central Sector Generators as CERC does not deal with consumers whereas State ERCs have to develop norms by keeping in mind the interests of generators and consumers. The Centre emphasizes on metering and reduction of subsidies in agriculture sector while the States are not very enthusiastic about it. The Power Ministry and the Institutions of Centre emphasize on privatization while the State Governments are generally averse to it.

There is even a debate whether power theft should be treated as a civil offence subjected only to monetary penalties or should be a criminal offence as provided in the Act. This situation places an increasing responsibility on the regulators to legislate as well as to implement, often in the face of resistance from the State and State-owned utilities. The situation has come to a pass where these utilities do not even file a tariff claim while filing Aggregate Revenue Requirement (ARR) and expect the regulator to enhance tariff suo motu. In this case, the State-owned

utilities find themselves unable even to act against their employees for blatant acts which cause disruption in supply and harassment to the consumers. This led the regulators to punish these employees under the Act which led to widespread criticism of the Regulators.

The gaps that are felt in promoting clean energy is that the Discoms are generally not ready for net-metering without which distributed generation particularly through roof-top solar and small wind turbines is difficult to promote. There is no mechanism for enforcing the orders of the Regulators.

The diversity of this country means that there are resource-rich and resource-poor States. Somehow, many resource-rich States are otherwise poor and unable to afford all the Green Power they produce. Even those who are not so poor are not willing to pay for all that green power. Resource-poor States are equally reluctant to import Green Power on the plea that it will act as further discouragement to generation in their State. Even transmission corridor constraints further compound the problem, thus, in most of the cases, Renewable Energy Certificates (RECs) are the only way to compensate the generators.

Pentti Puhakka from Ministry of Employment and the Economy, Finland shared his experiences from Finland in promoting clean energy. According to him, it is important to know from where energy comes from and where it goes. Energy statistics 2010 state that the total energy consumption by energy



sources is 1327.7 PJ (368.8TWh), of which 25% of energy is obtained from oil, 20% from wood fuels, 19% from nuclear energy, 11% from coal, 10% from natural gas, 5% from peat, 3% from hydropower and net export of electricity, 2% from heat pumps and solid recovered fuels and 0.08% from wind power. In 2009, the use of renewable energy sources (RES) was 337716 TJ (93.8 TWh) which is 25% of total energy consumption and the bio-energy use was 284177 TJ (78.9 TWh), which is 84% of renewable energy sources. There are over 400 medium and large scale bio-power and heating plants in Finland from farm size to the world's biggest construction. This country is one of the world leaders in the utilisation of wood-based fuels where 80% of RES is wood-based bioenergy and about 65 % of RES is based on residuals from forest industry. At present, Finland is concentrating on biomass as it is cost effective due to the existing paper and pulp industries in the country. The business plan for promoting energy efficiency is through different target groups by public private partnership.

The measures adopted by Finland to decrease energy demand are by the use of heat pumps in single family houses, application of building codes, new cars with EU legislation and information, replacement of boilers in farms, voluntary agreements in industry, Ecodesign, Energy Audits in Industry, Grants to single-family houses and public transport. Thus, the cumulative savings (the whole industry) for the year 2008-2010 is 2.73 TWh/a where 1.92 % of the energy use in the whole industry in 2010 and the cumulative savings of energy intensive industry is 2.51 TWh/a with 2.16 % of the energy use in energy intensive industry in 2010.



Technical Session 5: Innovative Financing for Scaling Up Clean Energy Investments

This session was chaired by Milo Sjardin, Head of Asia Pacific at Bloomberg New Energy Finance, Bloomberg New Energy Finance. While stating the clean energy financing, he said that more than 60% of the investments is flowing into wind power where investment on solar power is less in comparison to wind. Over two-third of the investment in renewable energy is financed by domestic sources (i.e. capital that was deployed by financial institutions or others directly into projects in their home countries). The proportion of domestic investment for clean energy and biofuels projects ranged from 35% to 94% for the top 10 recipient countries of overall asset finance. China attracted the most asset finance with \$192.2bn from 2004 through H1 2012 and its projects received 94% of their capital from domestic sources. In the US and Spain, projects received 60% and 61%, respectively from domestic investors. Brazilian and Indian projects also received the majority of their investment from domestic sources both at 81%. The United Kingdom bucked the trend with 35% of investment from domestic sources. In South East Asia, major asset financiers are development banks and commercial banks with major countries form SEA, Japan and Multilateral countries.



Mr. Sjardin highlighted the financing concerns as

- Risk return profile – whether returns sufficient for the risk taken; are there suitable mitigation instruments
- Cost effectiveness – can renewables compete with other energy sources; are there sufficient incentives to make a decent return
- Market access – possibility of independent power producer (IPP) to provide electricity
- Financial availability – willingness of local banks to finance RE; are there adequate and low cost currency hedging instruments

In India, biomass tariff has kept on increasing every year and gas based power constitutes 9% of India power generation but has not grown significantly in recent years due to fuel constraints. For the wind projects in India foreign lenders give more emphasis to



payment and project development risks and the domestic lenders are more concerned about the wind and power off-take risks. IPPs tend to be cautious towards payment risk but otherwise are more optimistic about the risks associated with wind projects. Various guarantees offered by the promoter are the most effective tools of risk management. This is also the best way to mitigate the payment risks which was rated a high risk factor by them. Domestic lenders may be willing to finance a project if a letter of credit for an appropriate amount and duration is made available to them.

He concluded saying that in order to obtain scale, it is essential to ensure sufficient private domestic financing capacity. Capital costs for renewables are coming down while the cost of capital and the risk perception are not reducing fast enough.

The panelists in the session were; Dipak Dasgupta, Principal Economic Advisor, Department of Economic Affairs, Ministry of Finance, Government of India; Pankaj Sindwani, Head (Green Finance), Tata Cleantech Capital, India; Ashok Sarkar, Senior Energy Specialist, World Bank; Pravan Malhotra, Clean Technology Investments, South Asia, International Finance Corporation; & Andreas Thermann, Senior Energy Sector Coordinator, KfW.

Dipak Dasgupta from Ministry of Finance emphasized on constraints of financing and technology. In India, 50% of the finance is initiated by agencies like local banks who do not know which process is actually working or



effective. The solar sector is a big move, in addition, wind power is continuously moving ahead gradually. There is a huge amount of investment from the public sector and with the upcoming 12th year plan and the trillion dollar investments, more funds are likely to come. Government of India is focusing on PPPs for electricity generation. Another important energy source according to him is biomass, as we may run out of space in the solar sector. The National Clean Energy Fund is set up to fund research and innovative projects in clean energy technologies with the broader objective of cutting down India's carbon footprint.



Pankaj Sindwani from Tata Cleantech Capital spoke about Tata Cleantech offering a vast array of financial solutions and advisory

services to businesses and enterprises operating in the area of renewable energy, energy efficiency, water management and any other projects that aid carbon footprint reduction. In India, the installed capacity for wind energy is 69.50% followed by small hydro and biomass with 13.30% and 12.80% respectively; while solar energy for 4%. The key drivers of renewable energy in India are untapped potentials, energy security, NAPCC and government's push. Besides this, renewed focus on distributed generation and an attractive Foreign Investment Policy could also fuel a lot of demand.

The financial mechanisms for developing clean technology in India are fiscal mechanism, market mechanism and public finance mechanism. The role of public finance mechanism is more pronounced as it helps technologies to reach Grid/Fossil Fuel parity faster, improve the ability to pay and the credit worthiness of the off-takers across markets, engage local people and state governments and roll out parallel programs to attract private capital.

Ashok Sarkar from World Bank gave the overview of global energy efficiency financing. He stated that the required Energy



Efficiency Investments for both supply and demand side is about \$300 billion per year through 2030. There is a short fall of 250 million dollars and to cope up with this shortfall, private sector investment is very necessary. Improvements in energy efficiency and investments in renewable energy have a positive return on investment over time, but there are barriers to convert the clean energy potential into tangible investments.

The financing barriers to energy efficiency are limited internal funds and less borrowing capacity; lack of information awareness and communication between the project developers and financiers; project development and transaction costs, risk assessment and management and lack of capacity. A combination of financing instruments and regulatory/policy tools can be applied to address the different barriers that emerge, particularly in developing countries. In addition, increased consumer awareness and capacity building are also necessary.



Pravan Malhotra from International Finance Corporation in his presentation said that they



create opportunity for people to escape poverty and improve their lives. He stated that their priority is climate change as it is the biggest challenge to development today and IFC has committed \$8.1 billion in climate business for the year 2005-16 where 31% of the business accounts for generation of renewable energy. The market for renewable energy technologies is booming at the rate of 15% to 50% annually and more than 50 emerging market countries now have renewable energy targets or policies. Though the costs are higher than existing energy prices but in various settings, renewable energy is already cost competitive like wind in Mexico.

IFC is an active investor in emerging market power sector and renewable energy has constantly been 2/3rd of IFC's power business in recent years. There is an investment of US \$ 1.2 billion in South Asia for climate business where hydro power is followed by wind power and solar power generation investments. The market for renewable energy in India is also growing with continuous support from the Government through Renewable Energy Certificates (RECs) and Generation Based Incentives (GBI).



IFC finances cleantech companies with the potential to lead in technology and business model innovation, and produce high development impact in emerging markets. The investment sectors include clean energy, energy efficiency, water, agri-tech, recycling, storage, green building materials, micro-grid, and waste-to-energy.

Andreas Thermann from KfW said that they are the world's leading and the most experienced promotional bank that is devoted to the guiding principles of sustainability contributing to the economy, the environment and social cohesion.



KfW is supporting the model for housing energy efficiency programme in India. Under the energy efficiency programme in residential building, the project's objectives are to establish a pilot programme for promoting energy efficient new residential housing in urban areas, transfer successful elements of the decade-long experience of promoting energy efficient residential buildings in Germany to India, energy need of refinanced buildings at least 30% lower than benchmark building and adaptation of robust tool for energy performance assessment to

Indian conditions. For this, KfW provides concessional loan of EUR 50 million to National Housing Bank (NHB). This has led to the assessment, optimization and certification of 73 individual buildings in 11 housing developments (> 20,000 apartments). The CO₂ emissions reduction in certified developments is 32,800 t/p.a.





Closing Plenary

The two day event concluded with a lot of appreciation and accolades for the initiative. However, a general feeling of not having enough participation from other South Asian countries resonated amongst the attendees. The concluding session was chaired by S. Vijay Iyer from World Bank. He proposed an academy for knowledge transfer to be facilitated by the World Bank and would help in North-South-South knowledge transfer.

The session was carried out in an informal, interactive way wherein the panelists: Graham Pugh, Anil Jain and Tae Won Moon were given an opportunity to comment on or suggest the way forward. The general points of discussion were:

- There are no tier one partnerships taking place in terms of the North-South collaboration. For an effective knowledge transfer mechanism, there needs to be collaboration between the experts first and then the ministers.
- There needs to be more discussion around the best practices being followed across the world, especially Europe.
- We need to throw light upon what has not worked in other countries. In other words, what initiatives have failed to achieve energy efficiency levels.
- Such initiatives like the Delhi Clean Energy Conference need to take place in other BASIC countries as well.





SOUTH - SOUTH - NORTH KNOWLEDGE EXCHANGE (SSNKE) FACILITY



KNOWLEDGE PAPER

Prepared for



THE WORLD BANK INSTITUTE

By

AF - MERCADOS EMI

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PREFACE

A. CLEAN ENERGY MINISTERIAL

The Clean Energy Ministerial (CEM) is a global forum to share best practices and promote policies and programs that encourage and facilitate the transition to a global clean energy economy. CEM through its various initiatives, aim to develop awareness and facilitate knowledge exchange among the G-20 countries in the areas of Clean Energy and Energy Efficiency. The 13 initiatives of CEM are broadly categorized under three heads. (i) Energy Efficiency¹ (ii) Clean Energy Supply² and (iii) Cross Cutting³. The 21st Century Power Partnership, under which the South - South - North - Knowledge Exchange (SSNKE) facility is proposed, is among the key Cross Cutting initiatives of the CEM.

B. OVERVIEW OF THE 21st CENTURY POWER PARTNERSHIP

The 21st Century Power Partnership of the CEM aims to bring together the CEM member countries on issues relating to large-scale integration of clean low-carbon generation, distributed generation, renewable energy, energy storage, energy efficiency, demand response technologies through smart policies and programs that leverage smart grid solutions and clean energy technologies, while expanding electricity access and keeping costs to consumers low. These represent emerging areas where various member countries of the CEM have much to share with, and learn from each other. While the rest of the CEM initiatives focus broadly on technology development, resource estimation and application development etc, the 21st Century Power Partnership aims to cover aspects related to policy and market development, and also deployment to promote new and innovative business models. Hence, the 21st Century Power Partnership essentially plays an integrator role enveloping all the other initiatives of the CEM and aims to provide a coherent development framework for clean energy development in the country.

1 This include includes Electric Vehicles, Energy Efficient Buildings and Energy Efficient Appliances,

2 This includes Bio energy, Carbon capture, Hydro power and Solar & Wind

3 This includes 21st Century Power Partnership, Clean energy policy, Energy access, Smart grid and Sustainable cities

The specific goals of the partnership include the following:

- Developing and sharing knowledge on key topics related to the transformation of the electricity sector
- Strengthening and disseminating technical tools to accelerate the transition to a more modern electricity sector
- Bolstering the capacity of experts needed to advance the policies, programs, and practices required to transition toward a clean and efficient power sector
- Applying the knowledge, tools, and capacity developed through this effort to improve national and sub-national policies and regulations

C. IMPORTANCE OF KNOWLEDGE EXCHANGE

Knowledge Exchange refers to sharing of information and experiences for customized learning. Development through exchange of knowledge, both Explicit⁴ and Tacit⁵ means is now becoming an important part of agenda of countries particularly the developing ones. These emerging economies have realized the importance of customized transformational learning based on practical experiences in other countries, thus reducing the knowledge divide, building consensus and promoting the concept of cooperative development. Through knowledge exchange, countries are able to identify possible routes of finding solutions to the recognized challenges, by learning from best practices in other countries and also get an opportunity to share their experiences. Knowledge exchange is a good tool for implementation of existing project ideas but also an excellent tool to share new ideas. Apart from this, knowledge exchange creates an opportunity for countries to get greater visibility, establish political relations and enhance business prospects etc.

Knowledge exchange can be a vital tool for mutual learning and involve various stakeholders, participating teams and change agents⁶. The success of knowledge exchange programme depends on having the right people, groups and institutions involved. The entire process is to be facilitated by knowledge hubs⁷, supporting and

4 Knowledge that can be documented and articulated

5 Knowledge that cannot be documented and is in the form of skills and experience

6 These are the people who initiate and manage the change process.

7 A country led institution (public or private) that connects the partners of knowledge exchange

connecting development practitioners (both central and state level) in a country to external peers who offer or seek development expertise.

To facilitate the learning process among developing nations as well as exchanging relevant experiences with developed countries, the SSNKE facility is proposed to be mainstreamed within the 21st Century Power Partnership. SSNKE will provide a platform for having a stronger interaction in a sustainable manner amongst policy makers, regulators, technology experts, practitioners, civil society, finance professionals and the private sector of the CEM member countries in the areas of large-scale integration of clean energy, distributed generation, renewable energy, energy storage, energy efficiency, demand response technologies and smart grids.



I CEM'S SSNKE FACILITY

1. BACKGROUND AND OBJECTIVE

The focus of the SSNKE facility is on immediate issues that are required to be addressed for effective and fast paced deployment of clean energy and to foster cooperation among countries. These potential issues to focus on are:

- Clean energy technologies
 - Renewable energy, including solar (photovoltaic and CSP) and wind energy;
 - Energy efficient appliances, including lighting (for both grid and off-grid applications) and
- Market instruments (e.g. domestic trading mechanisms for energy efficiency certificates such as Perform Achieve Trade scheme in India, ESCOs, renewable energy competitive bidding and auctions)
- Regulatory policy and institutional approaches for promoting clean energy (e.g., Feed - in - Tariffs (FITs), building codes)
- Innovative financing mechanisms (e.g., partial credit guarantees, utility DSM incentives)

The knowledge exchange initiatives under SSNKE will depend upon a country's capability to contribute and opportunities to learn from other countries. This will include lessons on policy measures, institutional development, financing, markets etc. Among the G-20 nations, there is a substantial body of knowledge among member countries on each of the thirteen areas that CEM addresses. However, at this stage there are limited platforms where the countries can actively share knowledge and learn collaboratively from each other. Further, several of the currently available platforms are largely technology or finance focused. While these remain important priorities, for developing countries, institutionalization of learning remains a weak link. It is important for public authorities to establish institutional systems to support policies and programs in order to facilitate high compliance or participation rates.

The SSNKE facility aims to facilitate knowledge exchange in clean energy among developing nations as well as deriving relevant experiences from developed member countries represented in CEM. A principal objective of the SSNKE facility is to promote exchange of knowledge between entities directly involved in the clean energy development and implementation process, specifically governmental organizations, which lead strategic policy making, and local governmental organizations in the field, which are ultimately responsible for the implementation of clean energy actions and measures at the project and/or program level.

SSNKE will thus create a platform to facilitate stronger interactions on a sustainable basis amongst policy makers, regulators, clean energy practitioners, technology and finance professionals, and civil society representatives from participating countries. These will include specific knowledge exchange activities including twinning arrangements, learning networks and communities of practice, summer schools, exchange tours, field visits, policy dialogs, peer-to-peer interactions, and formal training programs and so on. Some of these activities will be piloted in the first year of operation of the SSNKE in 2013-2014.

2. SCOPE OF THE SSNKE FACILITY

The scope of the facility in the first year will comprise of exchange of knowledge and best practices between the CEM countries in the key thematic areas of clean energy technologies, market instruments, regulatory policy & institutional opportunities and innovative financing mechanisms. It will also entail pilot testing of different types of knowledge exchange instruments and monitoring the progress of proposed outputs and outcomes. The SSNKE facility will be a revolving facility with ownership being taken by the host country. Since the SSNKE facility's Secretariat will be hosted within the CEM Secretariat, the country which hosts CEM will take leadership of the facility's activities during the year. India being the host of CEM-4 will lead the SSNKE in its initial first phase of 2013-14.

Once it gathers momentum, SSNKE is likely to set into motion a concrete set of actions that will have very extensive reach and leverage since several participating member nations of the 21st Century Power Partnership have much to their credit in terms of achievements, experiences and development plans. Countries like South Africa, Mexico and India have initiated measures to support various institutions in designing and implementing policies and programmes to promote large scale deployment of renewable energy and increased energy efficiency throughout the economy. In South Korea, energy efficiency is widely recognized as a crucial pillar of energy policy, positively contributing to national agenda. Similarly, China and Brazil have been paying attention to enhancing energy efficiency, especially in the wake of the rapid expansion of power generating capacity in these countries. These emerging economies have been active in collaborating with other developed countries in for sharing knowledge and technical know-how.

The SSNKE concept recognizes the various bottlenecks and the need for institution development and the imperatives of exchange of experiences between countries in this regard. The knowledge exchange is proposed to take place between senior management and working level officials of different institutions. The proposal for the SSNKE facility will be formally presented on April 18, 2013 for consideration by the CEM members. Starting with CEM-4 but continuing thereafter into the year to follow in CEM-5 in Seoul, the SSNKE will create a platform for knowledge exchange between peer groups in areas of identified priority.

3. OPERATION OF SSNKE FACILITY

The SSNKE facility will create a platform for organizing knowledge exchange between the countries through specific instruments and activities including (but not limited to) twinning arrangements, dedicated learning networks and communities of practice, summer schools, exchange tours, field visits, policy dialogs, peer to peer interactions, formal training programs, knowledge portals and so on. It is expected that the SSNKE facility will also promote institutionalization of knowledge among country-level entities directly involved in the clean energy implementation process, including local governmental organizations and other entities in the field, which are ultimately responsible for the implementation of clean energy actions and measures at the project and/or program level. Within the government and private sector organizations, the

knowledge exchange is proposed to take place between the working level officials. The interventions will be designed "from start to finish" – will be comprehensive and multi stakeholder, involving senior management officials and working level officials which will allow for absorption of knowledge on best practices, and their institutionalization and mainstreaming (projectized).

The facility will be coordinated by the CEM Secretariat in collaboration with the World Bank and with support from other relevant CEM stakeholders⁸. The SSNKE facility will be led by India in its initial first phase of 2013-14 and activities will be implemented jointly by the Planning Commission, Government of India and the Department of Energy, Government of United States.

Knowledge exchange under the SSNKE will entail the following:

Step 1: Identification of topics: Identification of the cross-cutting topics where the SSNKE will operate is the first step towards knowledge exchange. The framework is provided by the 21st Century Power Partnership, and this would be addressed in order to obviate overlaps with other institutions that form a part of CEM-4.

Step 2: Identification of priority areas within the selected topics: In the identified domains, using developing countries' needs/priorities as well as their capability to contribute, this step will entail identifying the priority areas within the domains. It can be reasonably anticipated that similar issues will prevail in most of the countries within the CEM (both in developing and developed nations), where the subsequent steps will become more generic and provide for a wider platform of peer to peer knowledge exchange.

Step 3: Identification of the instruments of knowledge exchange. Several options exist in terms of the framework of knowledge exchange. These include:

- a. **Formal arrangements** between the countries to create a firm basis for the exchange in terms of (a) priority areas; (b) platform for interaction (study trips,

8 The stakeholders will be from CEM countries viz. Australia, Brazil, Canada, China, Denmark, the European Commission, Finland, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Norway, Russia, South Africa, Spain, Sweden, the United Arab Emirates, the United Kingdom, and the United States

common training and knowledge exchange platforms; (c) twinning arrangements etc. The formal arrangements would serve as umbrella agreements for follow-on actions.

- b. **Creating a Community of Practice (CoP)** to provide more specific arrangements and facilities for closer interaction between entities on either the entire range of priorities or on specific issues. The CoP is a group of people who interact regularly on a common topic of shared interest with the goal of learning from one another. A CoP can be formal, with a detailed mission, structure, funding, etc., or informal—driven by peer-to-peer exchange of knowledge and information.
- c. **Creation of networks:** Creation of formal networks that operate on the web can create powerful mechanisms for identified areas. However, these networks need to be effectively managed to ensure that the exchange areas well directed towards the objectives identified during CEM-4 and leads towards the desired outcomes.

Step 4: Facilitation and efficiency review mechanism: Facilities such as the SSNKE are well intentioned, but often fail to deliver knowledge outcomes due to poor implementation. Obviating this would require careful monitoring of implementation to ensure that the measures proposed are initiated, sustained during the year and brought to bear in terms of the objectives by undertaking quarterly reviews. The role of CEM Secretariat will be vital here. The Secretariat works closely with participating governments to ensure that the ideas are fleshed out and commitments are kept. For the SSNKE facility, an Empowered Group is proposed to be formulated which will work in close collaboration with the CEM Secretariat. The group will include knowledge providers, knowledge recipients, change agents, facilitators and brokers to conduct reviews. The review will be undertaken for knowledge exchange during the first year of operation of the SSNKE on defined objectives and metrics (6 months, 9 months and 12 months of CEM-4), which will be reported back during CEM-5 by the Empowered Group feedback from users on efficacy—on identified metrics and also in overall terms (during CEM-5) and efficacy assessment and modification to improve impact.

II PROPOSAL FOR YEAR 1: FROM INDIA TO SOUTH KOREA

As one of the world's fastest-growing economies, India's growth has created an intense appetite for energy that the country is hard-pressed to meet. Issues concerning climate change and those related to availability and costs of fossil fuels make it extremely necessary for India to adopt clean energy solutions through the entire energy value chain and the country does recognize this. A vibrant private sector both at the generation and consumption ends, makes technology and business model innovation a commercial opportunity. Indian corporate sector is also becoming cleantech focused both in terms of energy supply and consumption. A large number of corporations now follow a triple-bottom line (Economics-Environment-Community) approach, formally and informally. India's Perform Achieve and Trade (PAT) scheme on energy efficiency and the Renewable Energy Certificate (REC) scheme for promoting renewable energy make very significant moves towards market creation for clean energy. These schemes internally recognize the participation of a large number of producers and consumers in the market processes.

India's energy security and sustainable development rests on large scale deployment of renewable energy. Though renewable energy in India has grown at a fast pace in the past few years, significant challenges do exist in integrating the intermittent renewable energy to the grid. Proper control mechanisms, accurate forecasting and planning, infrastructure development etc. that form the most crucial aspect in grid integration, are still a problem. Off-grid RE based systems hold promise for India in the form micro grids for local supply of power. However in India, these have not been operationalized on a large scale due to lack of advanced storage technology and the necessary smart grid infrastructure. Micro-grids in India also come with several associated issues such as lack of advanced storage technologies, infrastructure to support functions such as real time generation and consumption tracking, status tracking and control, battery management, demand side management and response. This is a critical area that India needs further strengthening on. In several cases favorable policies and regulations are not backed by institutional structures, financing and implementation arrangement to take forward the initiatives. On the Demand

Response side, India is still at early stages of testing the concept and has much to learn from other countries.

Given this backdrop, it is important to identify areas where challenges exist in the sector in deployment of clean energy solutions and implementation of energy efficiency measures. India, as a host for CEM-4 offers a viable starting point for multilateral cooperation on such vital aspects. There are areas where India can learn from other countries, including both developed and developing world. India can also offer useful lessons to other countries in some of these areas. The following key areas have been identified as India's priorities:

- **Variable Renewable Energy Grid Integration**
- **Energy Efficiency**
- **Demand Response (DR)**
- **Micro Grids**

Even as the initial activities would commence with India, it is anticipated that building on this start, other CEM member countries would follow this approach to develop their own proposals and identify specific areas of partnerships between the member countries, in the run up to CEM-5 which can be put in action on a multi-year time frame.

1. INDIA'S PROPOSAL UNDER SSNKE FACILITY

As an initial lead for SSNKE, India's priority areas are of relevance, but are several. To prioritize among them it is important to identify a few that can provide a basis for starting the facility. The priorities have been analyzed in the following table.

Table 1: India's key priority areas and their relevance to its needs, contribution and policies

Priority Areas	India's Needs ⁹	India's Contribution ¹⁰	Policy Implementation Context ¹¹	Overlapping with other CEM Initiatives (Low-L, High-H) ¹²
Variable Renewable Energy Integration	✓	✓	✓	L
Energy Efficiency	✓	✓	✓	H
Demand Response	✓	✓	✓	L
Micro Grid	✓	×	✓	L
Energy Storage	×	×	✓	H (Carbon Capture, Use and Storage Action Group under Clean Energy Supply)

Variable Renewable Energy Integration, Energy Efficiency, Demand Response and Micro Grids emerge as the most important priorities for India to be addressed in the proposed knowledge exchange facility. Although energy storage is equally critical for long term development it may not figure as immediate priority for India under the SSNKE.

Table 2 below identifies different countries that can exchange useful lessons with India in the identified priority areas (in the Indian context) and play a crucial role as a knowledge partner under the SSNKE.

9 Areas where India faces challenge and will act as a knowledge recipient

10 Areas where India can offer useful lessons to other developing countries

11 Where policy exist in India, but implementation is an issue on account of weak structures, systems and institutions, and hence learning from other nations is of significance

12 Degree of overlap of the cross cutting areas with other CEM initiatives. Areas of high degree of overlap are sought to be avoided

Table 2: Mapping of countries vis-a-vis the areas where they can act as knowledge providers

Countries	Variable Renewable Energy Integration	Energy Efficiency	Demand Response (DR)	Decentralized Distribution & Generation/ Micro Grid
India		✓		
South Africa		✓		
U.S	✓	✓	✓	
China		✓		✓
Mexico		✓		
Spain	✓			✓
Denmark	✓		✓	✓
Japan				✓
Brazil		✓		
Sweden			✓	
South Korea		✓		
Finland			✓	
Germany		✓		✓
France			✓	
Scotland				✓

A detailed description of experience of various countries in the identified priority areas has been provided in **Annexure 1**.

In the identified priorities, India's capability to contribute and opportunities to learn from other countries are to be analysed under four thematic areas. These are (i) Policy/Regulation, (ii) Institutional Development, (iii) Financing, and (iv) Markets (Refer

table 3). Technology being addressed in other CEM initiatives is not being considered here under the SSNKE. Similarly among the identified priorities energy storage may not figure as an immediate priority, hence not being considered. These are likely to be considered in the subsequent knowledge exchange programs.

Table 3: India's specific areas of partnership under SSNKE

Priority Areas	Variable Renewable Energy Integration	Energy Efficiency	Demand Response (DR)	Decentralized Distribution & Generation/ Micro Grid
Policy/ Regulations	<ul style="list-style-type: none"> ● Forecasting Code ● Regulatory framework related to Scheduling and Dispatch of VRE Generation, Balancing and Settlement ● Network codes and control mechanisms for voltage and reactive power control; and for planning of RE generation ● Charging mechanism and recovery of cost of integration 	<ul style="list-style-type: none"> ● Policy initiatives for promotion of energy efficiency 	<ul style="list-style-type: none"> ● Business model & Commercial framework for DR implementation ● Regulatory Procedures governing DR transactions – commercial framework including incentive framework, investments and monitoring & verification systems 	<ul style="list-style-type: none"> ● Standards for addressing design, operation and protection issue ● Standards for integration of micro grid with the power system ● Mechanism for pricing the electricity generated through micro grid.
Institutional Development	<ul style="list-style-type: none"> ● Forecasting Tools and Procedures ● System Operations Process Design including Infrastructure, Tools, and Processes ● RE Aggregators - Roles and Processes ● Process and Requirements for AS market 	<ul style="list-style-type: none"> ● Establishment of institutions responsible for EE initiatives ● Capacity building and resource development for the carrying out EE schemes ● Technical skills in the energy efficiency institutional context, and how effectively 	<ul style="list-style-type: none"> ● DR Cell at the Utility, its role and responsibilities. Infrastructure requirements & skill development ● Demand Response Aggregators (DRA) - Roles and Processes ● Standards and Protocols to be implemented 	<ul style="list-style-type: none"> ● Acceptance by the utilities. Utilities tend to resist islanding of the grid on safety grounds ● Identification of responsibilities among the involved entities ● Coordination and control

Priority Areas	Variable Renewable Energy Integration	Energy Efficiency	Demand Response (DR)	Decentralized Distribution & Generation/ Micro Grid
		<p>these skills are being accessed to provide needed technical assessments to enterprises and financiers</p> <ul style="list-style-type: none"> ● Development of ESCOs 	<p>adopted by the participants</p>	<p>among the institutions</p>
Financing	<ul style="list-style-type: none"> ● Financing of Green Corridors at inter-state and intra-state level ● Financing for tools, infrastructure and other resources required for large scale RE integration 	<ul style="list-style-type: none"> ● Initial investment in the costs of energy audits, preparation of DPRs. Industries seek soft support for these upfront costs ● Bank Appraisal methods and monitoring of bank procedures 	<ul style="list-style-type: none"> ● Financing Models for DR programs - upfront financing and recovery mechanism 	<ul style="list-style-type: none"> ● Financing models and funding for research in technology ● Large upfront investment in technology
Markets	<ul style="list-style-type: none"> ● Design, Development and Operation of Ancillary Services (AS) Markets ● Integration of other markets e.g. REC 	<ul style="list-style-type: none"> ● Market based mechanism for incentivizing energy saving 	<ul style="list-style-type: none"> ● Market mechanisms to respond to the price signals 	<ul style="list-style-type: none"> ● Market mechanism for pricing the electricity generated through micro grid.

The above table primarily deals with areas where India is making rapid progress, but needs to learn from other countries for effective implementation and institutionalization. In the field of energy efficiency, India can both learn and offer useful lessons in terms of policy/regulatory and institutional framework to other countries.

Box 1: Country wise best practices in the field of clean energy deployment and energy efficiency

South Korea:

Korea's Standby Power 1 W Policy aims to reduce standby power usage below 1 W. In July 2005, Ministry of Knowledge Economy and KEMCO established "Standby Korea 2010" which is a national roadmap to limit standby power to below 1W by 2010. The roadmap is composed of 3 phases. In the first phase (2005~2007), 1W policy is established on a voluntary basis. The second phase (2008~2009) is a preparatory period for stable transition to mandatory regulation of the "Standby Korea 2010". Starting from the third phase (from 2010), all electronic goods traded in Korea are subject to mandatory standby power 1W policy.

India:

- India's Perform, Achieve and Trade (PAT) scheme is an innovative market based mechanism to enhance cost effectiveness of improvements in energy efficiency in energy intensive large industries and facilities, through certification on energy savings that could be traded.
- Bureau of Energy Efficiency (BEE) has launched the Super Energy Efficient Program (SEEP). This program would offer manufacturers incentives to produce super efficient appliances that are 30-50% more efficient than the most efficient ones available in the market such as the five star labeled appliances. BEE has already identified ceiling fans under SEEP.
- Renewable Energy Certificates (RECs) in India are market based instruments traded in the form of certificates to help resource deficient states to comply with their Renewable Purchase Obligations, thus promoting renewable energy based power generation in the country

South Africa:

- The Solar Water Heater Rebate Programme of ESKOM (Electricity Supply Company of South Africa) aims to replace conventional boilers with solar water heaters in about 50,000 households across South Africa potentially saving enormous GHG emissions by displacing fossil fuel use. The programme is being implemented under a strong institutional framework with active support by private sector with certain commercial banks, insurance companies, and benevolent donors driving various SWH initiatives in different parts of the country. When a customer will install solar water heater it will receive a rebate from ESKOM. The programme uses international best practice model for rebates where the customer pays full installation price and claim back the rebate amount from the facilitating auditors.

China:

- The China Industry Program supports the development and implementation of policies and standards that increase the energy efficiency of equipment and products in the industrial sector. The program is particularly interested in efforts to
 - Improve the energy efficiency of energy-intensive industrial sectors by providing technical support and capacity-building on energy planning, auditing, benchmarking, and Energy Efficiency Agreement.
 - Strengthen the energy efficiency of industrial equipment and products by developing and implementing standards and labeling programs for industrial equipment, as well as maximum allowable energy-use standards for industrial products

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- China has adopted regional residential building energy codes that reflect different climate zones and heating/cooling energy usage patterns as well as a national commercial building energy code. There are national technical codes on building retrofits and lighting design.

Germany:

Germany has well-established Feed-in Tariffs (FIT) scheme. The FIT scheme rewards people financially to generate and export electricity they produce from renewable sources like solar and wind. The FITs make the installation of renewable energy systems a worthwhile and secure investment for the producers, manufacturers, investors and suppliers by guaranteed access to the grid, favorable rate per unit and the tariff term guarantee.

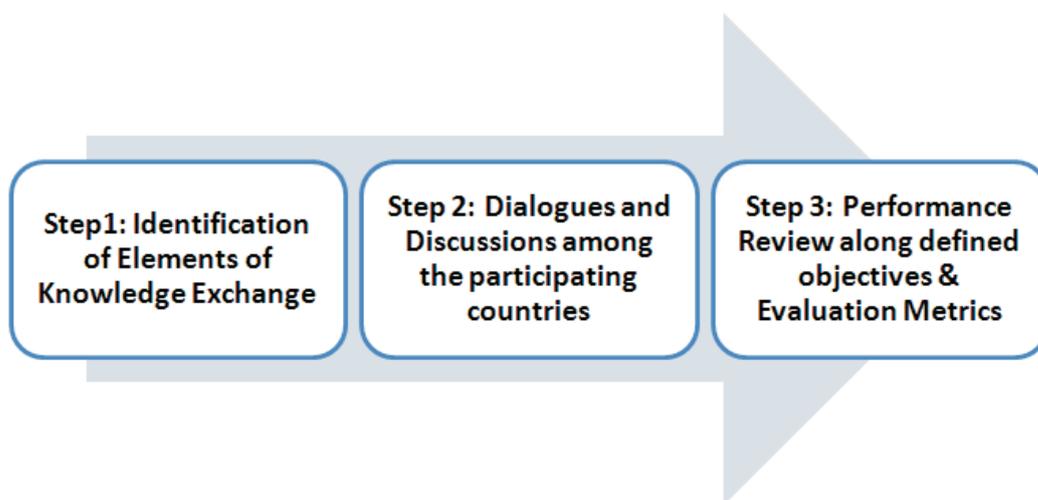
The above provide a context to the knowledge exchange needs identified under the SSNKE. In actual design the program design has to bear in mind that countries like India operate in a federal structure where the issues, priorities and capabilities vary widely between the federal and state levels. The efforts thus have to be aligned to the realities of the operating environment in countries like India and focus on institution and capability building both at federal and (importantly) state level institutions. Further, the context, issues, priorities and learning capabilities of institutions vary widely between developed and developing countries. The SSNKE program would need to adequately reflect these realities. Focus is also required on the creation of mechanisms for institutionalization of knowledge acquired within government agencies as well as beyond, including in research institutions, civil society organizations, and the private sector. The key to success of the SSNKE would be to create a broad knowledge base that sustains and can be built upon. The mechanisms and programs proposed under SSNKE would have to adequately address these priorities.

A detailed mapping identifying countries that could offer relevant experience to India has been provided in Annexure 2.

2. PROPOSED MODALITIES FOR IMPLEMENTATION OF SSNKE IN THE FIRST YEAR

Consequent to identification of priorities, it will be important to layout an implementation framework for operationalizing the knowledge exchange program for the first year of SSNKE facility. The following sequence of activities is being proposed to be undertaken as a part of the knowledge exchange (Refer figure 1).

Figure 1: Sequence of activities for knowledge exchange



1. The first step will be to identify the elements of knowledge exchange i.e. identification of goals, identification of counterpart teams and designing of most suitable knowledge instruments and activities. This entire process of knowledge exchange will be facilitated by knowledge hubs.

Identification of specific goals- For the first year of SSNKE facility, specific goals under each of the priority areas are to be identified. Various stakeholders in the field of clean energy development will get a platform where they can deliberate and decide the course of action. While the preceding section identifies India's priorities, which will serve to guide identification of specific goals, these would need to be detailed out and confirmed.

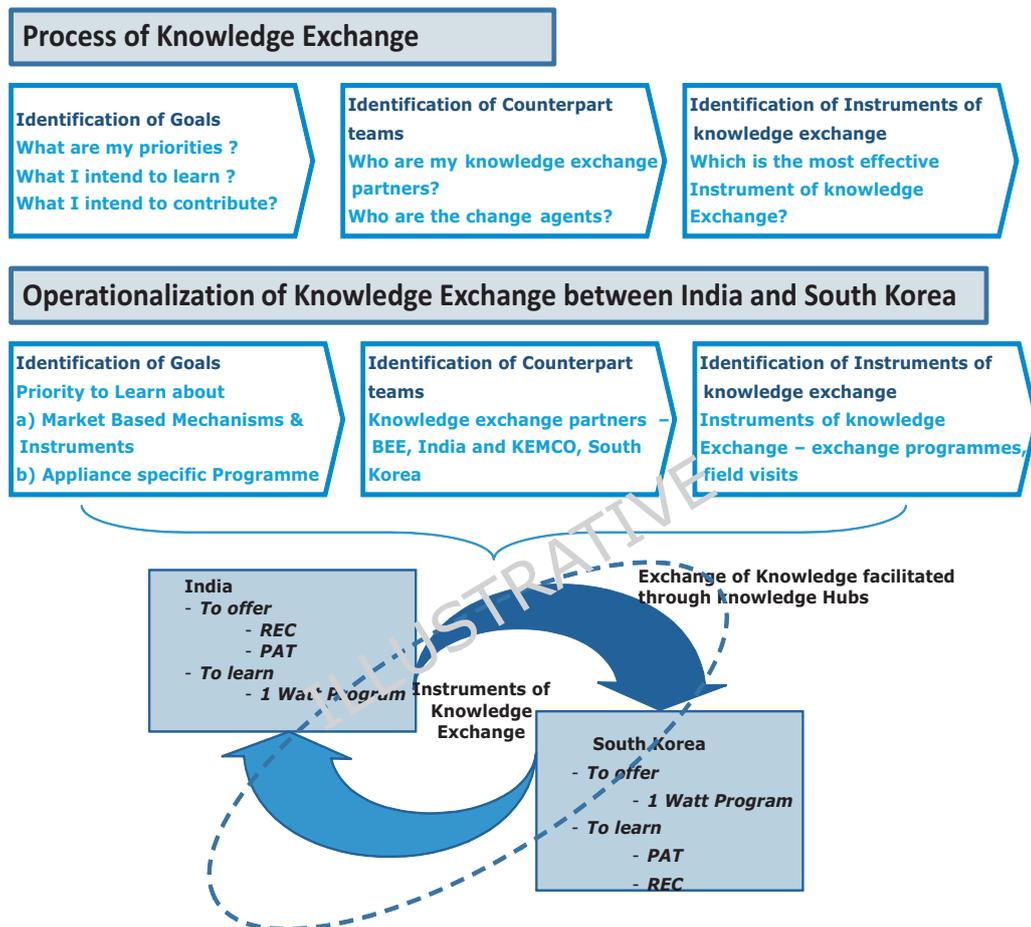
Knowledge exchange partners- The launch of the SSNKE facility will give an opportunity to various stakeholders to identify partners and counterpart teams in other countries with which they can collaborate for knowledge exchange. This would involve interaction with the respective country ministries and the entities involved in actual deployment. India on its part would have to identify its own participants from the federal/central and state level agencies who would be relevant for institutionalization of the knowledge.

Change agents- An important objective of the launch of SSNKE will be to identify bodies/individuals to act as a change agent. It is very important for India to identify the most appropriate body/agency as change agent. The change agent will then ensure that those who have firsthand experience of the reform process are providing knowledge and support to those who are able to mobilize resources and drive targeted changes towards reform. Through SSNKE, India can engage with individuals/bodies including public, private institutions, NGOs, research organizations etc. in other countries. For instance an arrangement of knowledge exchange with Energinet, the national transmission system operator in Denmark would help Indian counterparts to learn and adopt advance forecasting technologies and control mechanisms which are being used in Denmark. Similarly ESKOM from South Africa (for Demand Side Management) and KEMCO from South Korea (for Institutional Framework for Clean energy) could be important change agents. In the case of India it could be the Bureau of Energy Efficiency and also select state level utilities who have knowledge needs and contributions to make.

Knowledge hubs- It is crucial for India to identify the most suitable entity to host the facility. It has to be a country led institution (public or private) that can connect partners of knowledge exchange.

Figure 2 illustrates the proposed elements of knowledge exchange and their relevance with respect to SSNKE and its objectives. It is an indicative methodology showing how India and South Korea can come together and collaborate for sharing knowledge and experiences in the field of energy efficiency. The approach given in the figure would help the two countries achieve the desired goals in a systematic manner.

Figure 2: Process of knowledge exchange and typical illustration of knowledge exchange between India and South Korea



Once the goals are clear and counterpart teams and change agents have been identified, the next task will be to identify the instruments of knowledge exchange. These will be based on the thematic priorities as well as the imperatives imposed by the operating environment in developing countries like India. The following instruments/programs of knowledge exchange serve as illustrations of potential instruments (Refer table 4).

Table 4: Proposed instruments of knowledge exchange for first year operation of SSNKE facility

Instrument¹³	Objective	Principal Content	Indicative Timeline
Knowledge sharing Arrangements	Bilateral or multilateral instrument that lays out the mechanisms for co-operation	Instrument to lay out (a) modes (b) organizational/ management set-up (c) monitoring of the cooperation mechanism under SSNKE. Will set out the learning objectives clearly. Will also define who would be the appropriate attendees for the programs, and seek commitment that the attendees would remain a part of the network through the one year period	April - May 2013
Summer Schools/ Formal Training Programmes	Classroom style course/ practical sessions by the relevant government agency providing theoretical and practical insights on issues	More management focused to impart lessons and share on best practices on Clean Energy development with particular focus on knowledge management and institutionalization	September 2013
Knowledge Exchange Programs/ Fields visits	Exchange tours to pick up practical lessons in Clean Energy Development in identified priority areas	Will consist of (a) class room orientation (b) site visits (c) short dissertation papers by all participants on how the knowledge can be related and institutionalized in respective countries. Each of the specific areas identified to be covered	One week each in September '13, and January '14
Knowledge Network/ Knowledge Portal/Learning Networks	Create a platform where the participants can inter-se share learnings and also refer issues to experts	Can be a combination of web-based tools, calls/webinars and blogs. Will also promote individual personal contact between the various attendees	Continuing exchange
Evaluation missions	Assessment of the impact of the SSNKE and suggesting improvement areas	The Empowered Group of the SSNKE to identify the achievement against the learning objectives, challenges and the improvement areas	One mid-year evaluation in December 2013 and a final evaluation in March 2014 prior to CEM 5

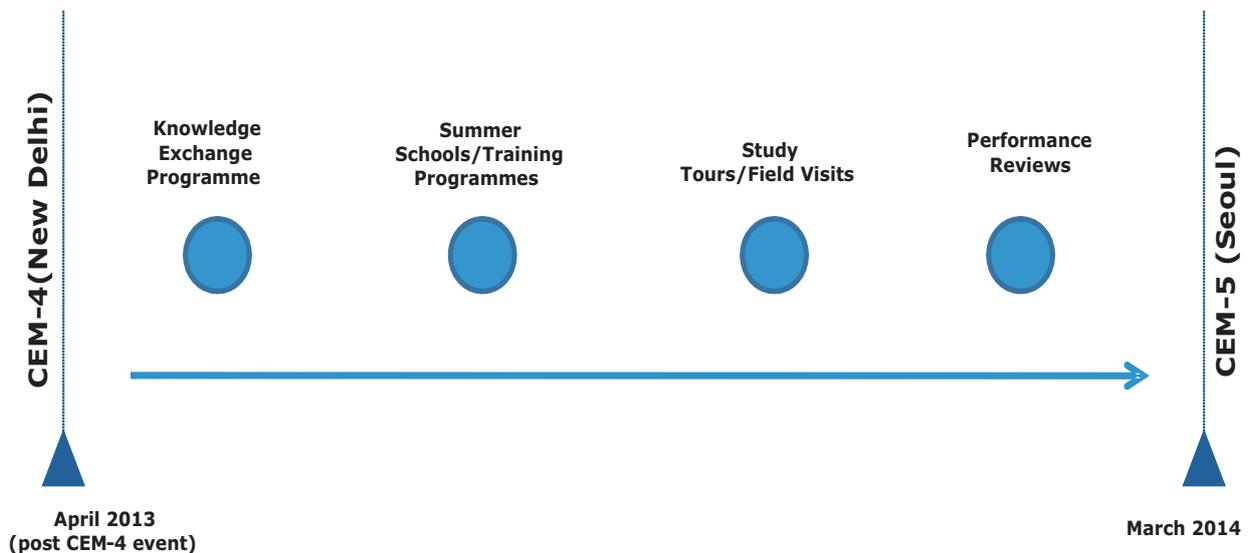
13 Among the instruments of knowledge, Policy dialogues between partnering countries will also play an important role in knowledge exchange. Policy dialogue is a process of communicating and negotiating priorities in a landscape of power and knowledge imbalances.

The above programme is illustrative and is being highlighted as a proposal for the facility. The proposed instruments of knowledge exchange are to be deliberated and finalized consequent to the launch of the facility.

2. Having identified the elements & instruments of knowledge exchange, the next step will be to have dialogues/ discussions among the participating countries. This will be required to have consent of all the stakeholders on identified priorities, instruments of knowledge exchange and to have discussion on the specific plans.
3. Formation of an empowered group for SSNKE which will review the performance of the facility along defined objectives and develop evaluation metrics (to be formulated within an estimated 1 month of CEM-4).

The above milestones are expected to be achieved during CEM-4. Post CEM-4, the following activities are proposed to be undertaken as per the indicative programme shown figure 3.

Figure 3: Indicative Post CEM-4 activities



III ILLUSTRATIVE PROPOSAL FOR 2ND YEAR: SOUTH KOREA AND BEYOND

While the initial first phase of the SSNKE facility in 2013-2014 will focus on developing the knowledge exchange framework and its operational modalities, along with piloting specific knowledge exchange activities amongst various CEM countries, this facility is expected to continue in the future, as an integral part of the 21st Century Power Partnership and the CEM. A monitoring and review mechanism will be used to assess the success of implementation of the programmes at different levels. This will be done by the empowered group for SSNKE during CEM-4.

The key aspects of the SSNKE to be discussed in CEM-5 in Seoul will include:

- Reporting the progress and achievements of the first year pilot phase
- Assessing the learning outcomes and results and defining the measure of success
- Outlining a guideline for knowledge exchange for other countries to follow based on the first year experience

The first year of the SSNKE facility will be a pilot phase, where the objectives of the facility will be tested through implementation of different knowledge exchange instruments and by monitoring the progress of outputs and outcomes that were targeted.

The review of progress can be undertaken at both the knowledge exchange facility and individual country levels by the empowered group. Such review and assessment would help in identifying the barriers in the implementation of programs and measure the success against the set targets.

The basics of measuring results and reporting the progress include¹⁴:

- Setting a baseline value at the start of the initiative – a quantitative or qualitative statement outlining the value of a measure before the knowledge exchange is implemented. Identifying the baseline value for each measure allows practitioners to later assess any changes in the value that could be attributed to the program.

14 These have been derived from The Art of Knowledge Exchange, The World Bank Institute

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- Targets or benchmarks for progress at various intervals or stages – the target value can be expressed in a way that is comparable to the baseline value. Target values can only be confirmed if target values are established at the beginning of the initiative.
 - Methods, tools and roles/responsibilities for collecting and analyzing the monitoring information – monitoring of indicators over time help in analyzing the achievement of capacity outcomes. It is important to clarify the data collection methods and tools to ensure implementation. Some examples of data collection tools include surveys, focus groups, structured interviews, etc.
 - Monitoring and evaluation outputs to improve the knowledge exchange initiative – regularly reviewing the results of activity surveys or feedback sessions with participants. Adjusting as necessary to ensure participants are getting the most out of each activity.
 - Plans for disseminating the performance information at regular intervals – developing a dissemination and consultation plan with stakeholders to discuss lessons, findings and evidence.



During completion of activities proposed for the first year of the SSNKE, the following questions would need to be addressed:

- What processes and methods could be improved?
- What were the overall learning outcomes achieved by the knowledge exchange?
- What progress was made towards the development goal? Can that progress be plausibly related to the change process supported by the learning outcomes?
- Do you anticipate any changes that would result after the program's completion? If yes, establish a timeline for follow-up assessment?
- What key lessons can be shared horizontally and vertically?

To measure the success of the knowledge exchange during the first year pilot phase of the facility, the outputs and outcomes of the specific knowledge exchange instrument/process will be assessed. Outputs to be assessed will include for instance, number of people trained, policy recommendations created, learning module completed and so on. The outcomes to be assessed will include behavioural and institutional changes resulting from the use of acquired knowledge and information. The outcomes will be measured through impact assessment and results assessment. The progress towards outcomes will be monitored at two levels:

- a) The level of the change agents: change agents are entities who initiate and manage the changes needed to reach the capacity development objective. This assessment will include monitoring the change agents' capacity outcomes as a result of the knowledge exchange. It will include assessment of ability to undertake certain actions because of raised awareness, enhanced knowledge and skills, improved consensus and teamwork, stronger coalitions, enhanced networks, or increased implementation know-how.
- b) The level of institutional capacity: this will entail assessing stakeholder ownership, enhancing efficiencies in policy instruments, and improving effectiveness of organizational arrangements.

The key outputs and outcomes to be assessed will be decided by the Empowered Group that is suggested for formation during the pilot phase of the facility.

The planning of the knowledge exchange from CEM-5 at Seoul will be for a multi-year period, with countries outlining their needs for knowledge exchange.



ANNEXURES

IV ANNEXURE 1- EXPERIENCE OF DIFFERENT COUNTRIES IN THE IDENTIFIED PRIORITY AREAS

VRE Integration

Among the identified areas, integration of RE is an important priority for some of the emerging economies; which have significant RE potential and where large scale deployment of RE occupies an important place in Governments' policy and future strategy. However, these developing countries like India, South Africa, and Mexico etc. have much to learn from other developed nations to counter various kinds of challenges. In the area of RE Integration, proper control mechanisms, accurate forecasting and planning, and regulatory practices play a crucial role in grid integration of RES and commercial settlement among the grid participants. There are several issues that are still new to India. The extant generation and transmission planning process does not explicitly take into account RE generation and is based on deterministic planning methods. Probabilistic transmission planning needs to be considered to reflect the probabilistic nature of outage and system parameters. Countries like Spain, Denmark, USA etc. have made considerable progress on these issues. These countries have enhanced their energy management systems using sophisticated tools and smart grid solutions. Most of these countries have highly advanced real time monitoring systems and forecasting tools to predict changes in RE generation. On the operation side, they have designed network codes and control mechanisms for voltage and reactive power control. Nordic countries have been able to enlarge balancing areas and diversifying the location and types of RE generation. Box 2 below highlights the experience of some of the developed countries in RE integration.

Box 2: Experience of developed countries in RE grid integration- lessons for the emerging economies

Planning and Forecasting

Spain has developed highly advanced forecasting techniques namely SIPREOLICO and SIPRESOLAR generating hourly and probabilistic forecast. These forecasts are modelled into the future network scenario to monitor and control future power flows. **Denmark** uses multiple, advanced forecast tools to plan system operation, day-ahead (cross-border) congestion management.

The Electric Reliability Council of Texas (ERCOT) in **USA** uses Large Ramp Alert System to help prepare for large and sudden changes in wind production.

Operational Mechanism and Grid code

Spain and Denmark have framed network codes and control mechanism for voltage and reactive power control. In Spain, the RED ELECTRICA DE ESPANA (REE) restricts access to generators on causes related to the system's operation security on the basis of access codes. Danish grid code requires wind turbines on the high voltage grid to remain connected to the grid in order to support the grid during faults. In USA, the various regional grids have developed widely varying wind power scheduling, dispatch, and operational mechanisms

Monitoring and Control

Energinet, the Danish national transmission system operator has greatly enhanced its **Energy Management System (EMS)** to monitor real-time performance of the power system. This includes real-time estimates of wind power to be fed into the grid. California Independent System Operator (CAISO), as a leader in state-of-the-art mechanisms, has developed a **Participating Intermittent Resource Program (PIRP)** that allows individual wind facilities to self-schedule according to shared forecasting technologies. In **Spain**, monitoring under strict security level has been one of the most important factors. The Control Centre of Renewable Energies (CECRE) does the real monitoring of RE installations using sophisticated tools. One of these tools is **GEMAS** that accesses the real-time information received in CECRE and uses it to find out whether the present generation scenario is permissible for the system.

Germany has been a real pioneer in building a competitive low-carbon economy. Germany has well-established Feed-in Tariffs (FIT) scheme. The FIT scheme rewards people financially to generate and export electricity they produce from renewable sources like solar and wind. The FITs make the installation of renewable energy systems a worthwhile and secure investment for the producers, manufacturers, investors and suppliers by guaranteed access to the grid, favorable rate per unit and the tariff term guarantee.

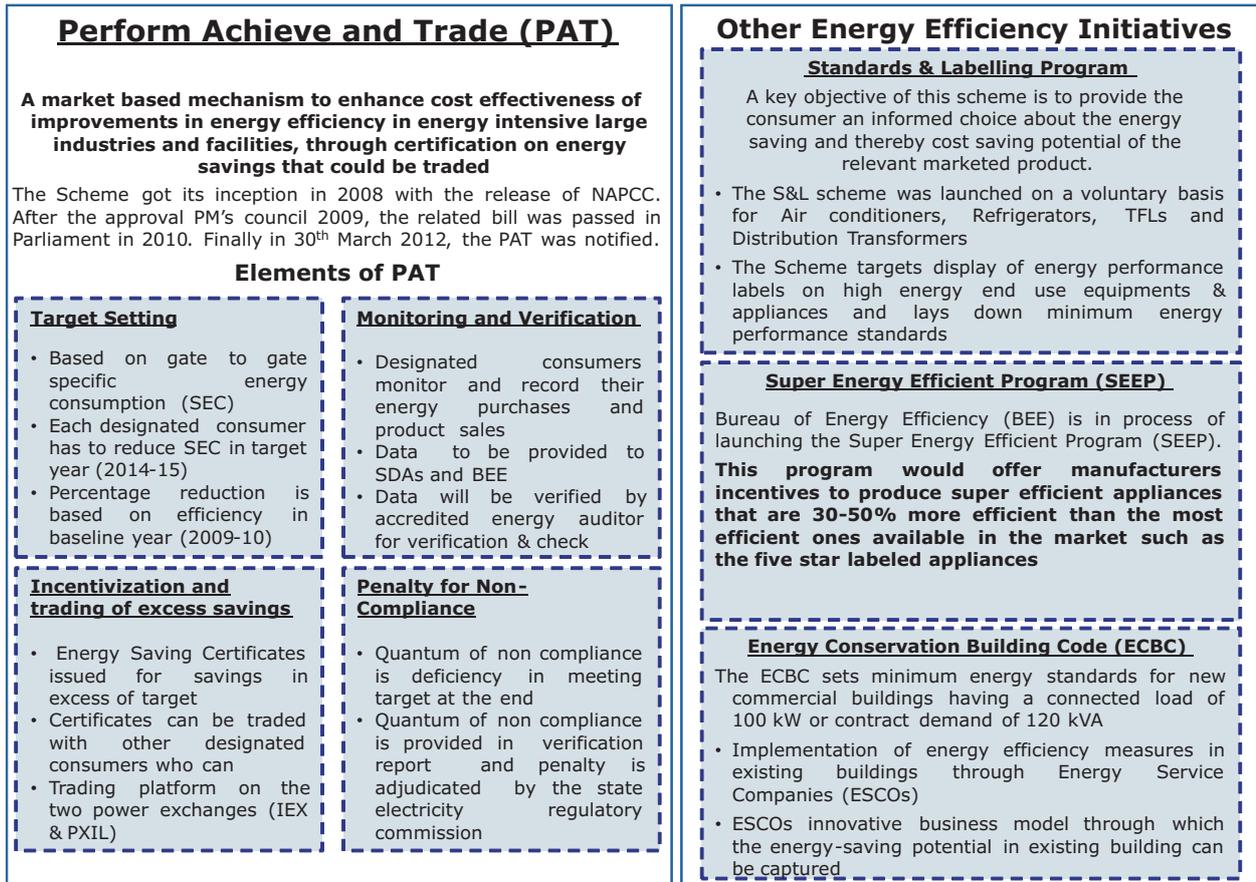
Energy Efficiency

As India copes with the mounting electricity demand associated with its economic growth, energy efficiency and DR¹⁵ have an important role to play. There are significant benefits in pursuing Energy Efficiency and Demand Response as a matter of energy, economic, and environmental policy and India is quite committed to pursuing these options. The National Mission on Enhanced Energy Efficiency (NMEEE) with its four initiatives namely Perform Achieve and Trade (PAT), Market Transformation for Energy Efficiency (MTEE), Energy Efficiency Financing Platform (EEFP), Framework for Energy Efficient Economic Development (FEEED), including the Energy Conservation Building Code (ECBC) under the aegis of Bureau of Energy Efficiency (BEE) are key schemes in the field of Energy

15 Demand Response besides contributing towards reduction in demand supply gap can also be considered as a balancing source for systems that are exposed to variable renewable energy.

Efficiency. Further BEE has also initiated other consumer focused initiatives like the Standards & Labelling Program, Super Efficient Appliance Program, etc. Figure 4 below indicates some of the EE initiatives in India. India as a country can learn from Italy and U.K to implement end-use efficiency measures at the utility and consumer level by introducing white certificates enhancing efficiency in final energy uses.

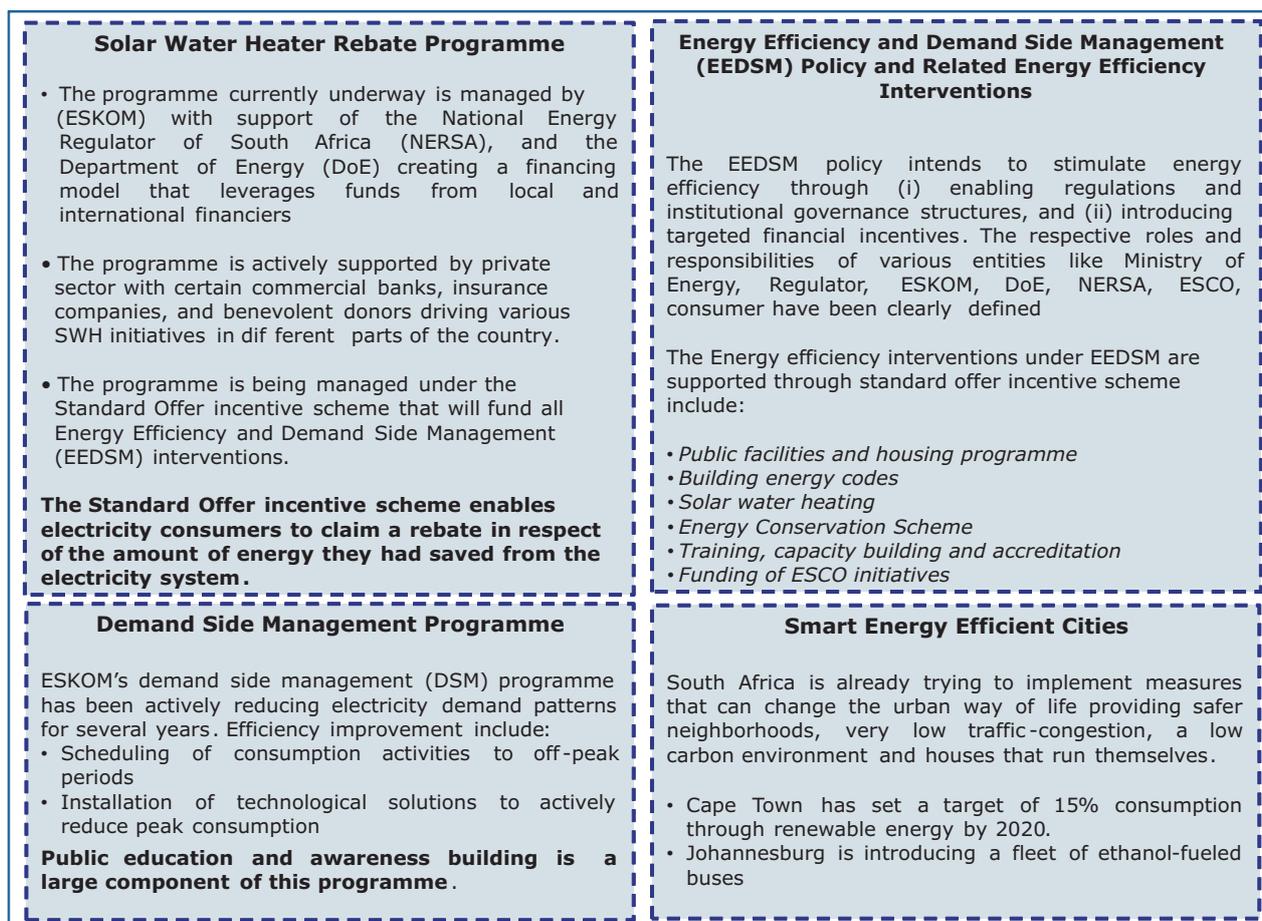
Figure 4: Energy Efficiency Programmes of India



Apart from India, South Africa and Mexico have also taken initiatives in deployment of RE and promotion of energy efficiency. These countries offer useful lessons in terms of International collaboration and efficient policy initiatives. In South Africa, a variety of strategies and policies have been created to harness RE potential in the country. The South African-German Energy Programme (SAGEN) supports various institutions in designing and implementing policies and programmes to promote increased energy efficiency throughout the economy as well as the deployment of renewable energy. The Working for Energy programme is a green energy initiative that covers renewable energy and demand-side management projects of capacity not exceeding 1MW of electricity in rural and low-income communities. The focus areas in the programme cover Biomass, Bio-fuels, Mini Grid Hydro and Smart Grid systems, Solar PV and Micro Hydro systems. South Africa's

Demand Side Management (DSM) programme focuses heavily on institutional development and coordination. The programme which is being implemented on behalf of the Energy Regulator (NERSA) involves Electricity Supply Company of South Africa (ESKOM) and ESCOs. The implementation of the programme is outsourced to ESCOs, which assist clients in industry, commerce and the residential sectors. Teams including members from various universities of South Africa are employed by the utility to measure the savings, against an energy baseline established prior to the intervention. Further, South Africa is being assisted by German International Corporation (GIZ) in its efforts towards a clean and sustainable development. In 2011, GIZ organized two study tours to Germany with a broad range of South African stakeholders in order to transfer state-of-the-art knowledge relating to the grid integration of renewable energy and the promotion of energy efficiency. Some of the key EE initiatives of South Africa are indicated in figure 5 below.

Figure 5: Clean energy initiatives and energy efficiency programmes of South Africa



Mexico is also on the verge of a solar and wind energy revolution. Today, the Latin American state has a thriving renewable energy program with active participation by both the private and public sectors. Initial incentive programs to support participation of IPPs, Government tax incentives and policy reforms in the form of energy bank to support sales to and purchases from the grid, predictable wheeling fees, lower capacity back-up fees, and net metering for small self-suppliers have been introduced through various RE related schemes. Mexico is also working in collaboration with Germany on a two-year scientific training program, developing renewable energy initiatives as well as other measures to tackle climate change through Energy Efficiency and DSM measures. Mexico is investing in various ways to promote modal shifts from private vehicles to public transport that will also enable larger shares of renewable in transport. Apart from building solar-powered charging stations, Mexico City had launched a zero-emission taxi program to put 100 electric taxis on the streets by 2012. As Asia ramps up its momentum of growth in cleantech industries, South Korea is another country that is making considerable progress. The East Asian country has shown tremendous growth in deployment of renewable energy and energy efficiency initiatives through conducive policies and clean energy findings. The Government has given out tariff and tax exemptions for penetration of clean energy technologies in the country. The Korea Energy Management Corporation (KEMCO) leads this development of clean energy in the country, under the aegis of Ministry of Knowledge Economy (MKE). South Korea's energy efficiency initiatives can serve as useful lessons for other emerging economies both in terms of enabling legal/policy framework and the concept being adopted. Box 3 below shows highlights the enabling legal/policy and institutional set up in Korea.

Box 3: South Korea's Legal/Policy and Institutional Framework- An important lesson for emerging economies

- **Supportive legal framework for the promotion of clean energy** - In Republic of Korea, the government's Act on Encouragement of Purchasing of Green Products (2004), directs public agencies to purchase goods that have at least one of the energy efficient labels or eco-labels. The Act also require the Ministry of the Environment to ensure that public agencies report annually on their Green Public Procurement (GPP) action plan implementation, procurement practices, and results.
- **Ideal Institutional set up** - In Korea, three government agencies collaborate to make its EEP program work. The Ministry of Knowledge Economy (MKE) establishes the framework for the program; the Korea Energy Management Corporation (KEMCO) is responsible for EEP program implementation and monitoring; and the Public Procurement Service (PPS), the country's central purchasing agency, negotiates contracts for energy efficient products and services on behalf of local governments and other public organizations. The PPS maintains databases of qualified products called 'Green Products Mall' —with brands, makes and models—to facilitate energy efficient product purchases.

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- **Policy Initiatives** - South Korea encourages public agencies to offer preferences for energy efficient products. In the Alternative Bidding System, contracts are awarded to the most appropriate bidder, taking into account quality, performance, and EE. Further, the registered energy efficient products get extra points in the bid evaluation process. Such a system has encouraged suppliers to raise the EE levels of their products.

South Korea's energy efficiency strategy focuses on building codes for new buildings, labeling programmes for Appliances and energy saving technologies for industries. Refer Box 4 below.

Box 4: Energy Efficiency Initiatives in South Korea

- Three programmes are being undertaken in South Korea promote high-efficiency appliances: (i) The Energy Efficiency Standards and Labeling Program (ii) The High-efficiency Appliances Certification Program (iii) The E-Standby Program

Currently in Korea, five national labeling systems are in place: (i) EE label, which serves as a mandatory rating and information label for target products e.g. Refrigerators (2) High efficiency appliance label, a voluntary certification for newer, high efficiency products e.g. transformers (3) Voluntary e-standby label, which certifies products that meet a low standby power requirement e.g. Consumer Electronics (4) Mandatory standby label, a warning label for products not meeting minimum requirements for standby power e.g. TVs. (5) Eco-label, covering a range of energy and environmental attributes

- KEMCO promotes voluntary agreements with industries and businesses investing in energy-saving technologies. These industries are entitled to financial and technical support and tax credits. Further, the Energy Saving Partnership Program (ESP) in Korea aims to share new energy saving technologies within the industrial groups

In China, the industry program supports the development and implementation of policies and standards that increase the energy efficiency of equipment and products in the industrial sector. The program is particularly interested in efforts to:

- o Improve the energy efficiency of energy-intensive industrial sectors by providing technical support and capacity-building on energy planning, auditing, benchmarking, and energy efficiency agreement.
- o Strengthen the energy efficiency of industrial equipment and products by developing and implementing standards and labeling programs for industrial equipment, as well as maximum allowable energy-use standards for industrial products

China has adopted regional residential building energy codes that reflect different climate zones and heating/cooling energy usage patterns as well as a national commercial building energy code. There are national technical codes on building retrofits and lighting design.

Demand Response

On the demand response side, India is still at early stages of testing the concept and has much to learn from other countries. DR model in itself has several variants that could be evolved as the pilot initiatives become successful in India. Among other countries, U.S has been able to implement DR quite efficiently. U.S Department of Energy promotes DR and ensures end user participation through incentive programs. Other countries that provide useful experience here are the Nordic Countries, France, Italy, UK, Australia etc.

Micro Grids

Off-grid RE based systems are promising for India either in the form of micro grids for localized supply of power or in the form of decentralized applications in the rural areas. Despite enabling provisions in the EA 2003 and the National Electricity Policy 2006 such decentralized distribution and generation has not proliferated to the desired extent. The outcomes of several programs have produced mixed results. Micro-grids is another area that has huge potential both in urban and rural context and needs to be explored further. These also come with several associated issues such as lack of advanced storage technologies, infrastructure to support functions such as real time generation and consumption tracking, status tracking and control, battery management, demand side management and response. The success of micro grids in Japan, China and other European countries has primarily been dependent on the effectiveness of policy initiatives in these countries and ensuring implementation wherewithal to affect actual results. This is a critical area that India needs further strengthening on. In several cases favorable policies and regulations are not backed by institutional structures, financing and implementation arrangement to take forward the initiatives.

V ANNEXURE 2: IDENTIFICATION OF INDIA'S PRIORITIES AND COLLABORATION OPPORTUNITIES

Having identified the priorities in the Indian context and the key areas of knowledge exchange, it is important to clearly identify the gaps/issues wherein knowledge exchange from other member countries could be useful. The focus of the following table (Refer table 5) is to undertake such mapping, and also identify countries that could offer relevant experience in this regard.

Table 5: Issues in India with respect to priority areas and best practices offered by countries

Priority Areas	Issues Gaps for India	Collaborative Learning/Opportunities
Variable Renewable Energy Integration	<ul style="list-style-type: none"> ● Voltage imbalance issues due to heavy reactive power drawls and variability in generation. This is the problem in several RE heavy Indian states. ● Planning and Forecasting of RE generation is an integral part of grid integration. The current practices are weak in this regard. Also, Forecasting code is absent. ● Need for evolving regulatory structure related to imbalance settlement. ● Need for evolving regulatory structure related to imbalance settlement. ● Similar issues are likely to be confronted as solar based generation increases. 	<p>Spain</p> <ul style="list-style-type: none"> ● Procedures for responding to voltage dips to prevent possible loss in flow of wind generation and for solar photo voltaic installations have been enacted. Further penalties are imposed for deviations from a range of reactive power control and power factor. ● SIPREOLICO and SIPRESOLAR are internal wind protection tools with CECRE (control centre for renewable energy in Spain). SIPREOLICO generates an hourly wind forecast and SIPRESOLAR generates a probabilistic forecast. These forecasts are modeled into the future network scenarios to monitor and control future power flows ● To handle technical challenges emerging from RE integration, the RED ELECTRICA DE ESPAÑA (REE) has designed network codes to restrict access to generators on causes related to the system's operation security <p>Denmark</p> <ul style="list-style-type: none"> ● Energinet, the Danish national transmission system operator has greatly enhanced its Energy Management System (EMS) to monitor real-time performance of the power system. This includes real-time estimates of wind power to be fed into the grid.

Priority Areas	Issues Gaps for India	Collaborative Learning/Opportunities
		<ul style="list-style-type: none"> ● Danish grid code requires wind turbines on the high voltage grid to remain connected to the grid in order to support the grid during faults. ● Energinet's Drift Planlaegnings (Operational Planning) System (DPS) tool integrates forecasts of wind and CHP output into system planning up to two hours ahead of operation-and in the near future up to five minutes. <p>USA</p> <ul style="list-style-type: none"> ● Due to different grid composition, rules and wind power penetration, the various regional grids of the USA have developed widely varying wind power scheduling, dispatch and operational mechanisms. ● California Independent System Operator (CAISO), as a leader in state-of-the-art mechanisms, has developed a Participating Intermittent Resource Program (PIRP) that allows individual wind facilities to self-schedule according to shared forecasting technologies <p>Germany</p> <ul style="list-style-type: none"> ● Germany has well-established Feed-in Tariffs (FIT) scheme. The FIT scheme rewards people financially to generate and export electricity they produce from renewable sources like solar and wind. ● The FITs make the installation of renewable energy systems a worthwhile and secure investment for the producers, manufacturers, investors and suppliers by guaranteed access to the grid, Favorable rate per unit and the Tariff term guarantee.
<p>Energy Efficiency</p>	<ul style="list-style-type: none"> ● Lack of institutions and capacities for public agencies to organize, transform and develop new and nascent markets for EE goods and services ● Lack of end-use efficiency measures at the utility and consumer level 	<p>South Africa</p> <ul style="list-style-type: none"> ● The EEDSM policy of South Africa intends to stimulate energy efficiency through enabling regulations and institutional governance structures. The respective roles and responsibilities of various entities like Ministry of Energy, Regulator, ESKOM, DoE, NERSA, ESCO, and consumer have been clearly defined. ● The Solar Water Heater Rebate Programme of ESKOM is being implemented under a strong institutional framework with active support by private sector with certain commercial banks, insurance companies, and benevolent donors driving various SWH initiatives in different parts of the country.

Priority Areas	Issues Gaps for India	Collaborative Learning/Opportunities
		<p>Mexico</p> <ul style="list-style-type: none"> ● The Residential Compact Fluorescent Light (CFL's) exchange programme involved a number of institutions/entities which played their respective roles making the project a success. ● CFE was responsible for identification and selection of parties involved in manufacturing, shipping and testing. ● There were entities involved in project design, implementation, distribution, logistic, media/marketing etc. ● There was efficient planning, coordination and monitoring at various stages of the programme. <p>South Korea</p> <ul style="list-style-type: none"> ● In Korea three government agencies collaborate to make its EEP program work efficiently. There is proper coordination and segregation of responsibilities among the institutions. ● The Ministry of Knowledge Economy (MKE) establishes the framework for the program; the Korea Energy Management Corporation (KEMCO) is responsible for EEP program implementation and monitoring; and the Public Procurement Service (PPS), the country's central purchasing agency, negotiates contracts for energy efficient products and services on behalf of local governments and other public organizations. <p>Italy and U.K</p> <ul style="list-style-type: none"> ● White Certificates are being implemented as a market mechanism for incentivizing end users to introduce energy efficiency measures in their use of electricity.
<p>Demand Response</p>	<ul style="list-style-type: none"> ● Lack of infrastructure and associated funding and necessary policy support ● Regulatory Structure for incorporation of costs and benefits from the DR programs ● Lack of Awareness and Resistance by the Consumer ● Resistance from Gencos/Traders and Utilities 	<p>NORDIC Countries</p> <ul style="list-style-type: none"> ● Informational campaigns devoted to improve consumer awareness are a usual practice in these countries. ● The increasing acceptance of DR was the result of high increase in electricity prices. ● Real-time pricing programs are operated in Norway, reference is made to day-ahead market ● Pilot project running in Denmark devoted to residential heating. There are tools allowing users through an internet portal to carry out DR measures in households

Priority Areas	Issues Gaps for India	Collaborative Learning/Opportunities
		<p>USA</p> <ul style="list-style-type: none"> ● The state of California invests nearly \$3 billion per year in energy efficiency and demand response programs that target electricity and natural gas customers to install high efficiency equipment, take measures to reduce their peak demands, and establish time-sensitive price structures that are more in line with the actual cost of providing the electricity. ● The U.S. Department of Energy promotes DR and ensures end user participation through incentive programs like Price-based demand response and incentive based demand response programs ● Bilateral DR programs in U.S include policies <ul style="list-style-type: none"> - Cost recovery and DSM funds - Loading orders and similar regulations - Peak demand mandates and energy efficiency portfolio standards <p>France</p> <ul style="list-style-type: none"> ● Days are distinguished according to price using a colour system. Customers can adjust their consumption either manually or by selecting a programme for automatic connection and disconnection of separate water and space-heating circuits ● "Tempo Tariff" program pertaining to critical peak pricing
<p>Decentralized Distribution & Generation/ Micro Grid</p>	<ul style="list-style-type: none"> ● Funding issues especially in rural areas ● Lack of operational and management model ● Energy storage is a major problem especially in context to variable RE generation 	<p>Europe</p> <ul style="list-style-type: none"> ● The Directive 2003/54/EC (provisions of European Law) has provided guidance to distributed generation. ● The 3 FP's (policy initiatives) in Europe focus on <ul style="list-style-type: none"> - Integrating renewable energy and distributed generation into Europe's electricity grid. - Involvement of 14 partners from 7 EU countries - Seek new control strategies and design solutions for micro grids, and develop suitable tools for micro grid operations - Significant funding from project partners ● Feed-in tariff policies have been effective in promoting distributed generation in countries like Spain, Germany and Denmark <p>Japan</p> <ul style="list-style-type: none"> ● In 1994, Ministry of International Trade and Industry established technical recommendations for distributed generation's access to the grid (EGA970-1993).

Priority Areas	Issues Gaps for India	Collaborative Learning/Opportunities
		<ul style="list-style-type: none"> ● The requirements included provisions for relays, protection switches, islanding prevention, and communication systems. ● Large scale involvement of private sector and stake holders in the implementation of micro grid project. ● NEDO (The New Energy and Industrial Technology Development Organization) funding a number of projects. <p>China</p> <ul style="list-style-type: none"> ● In 2011, China's National Energy Administration (NEA) drafted the Management Methods for Distributed Energy, an attempt to promote the micro grid concept. ● The Technical Standard for Distribution Energy Resources Access to Grid (Q/GDW480-2010) was promulgated and put into force on 2 August 2010. ● Central Government has funded project that has 10 kW of solar PV, two 30 kW wind generation simulators, 5 kW fuel cell, 300 Ah battery bank, ultra-capacitor bank, two 15 kW conventional generators, and various loads.

As observed from table 5, international experience can provide useful insights and lessons for India to develop and evolve customized solutions for specific problems faced by the country.



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**SUMMARY NOTES OF THE LAUNCH EVENT OF
SOUTH - SOUTH - NORTH KNOWLEDGE EXCHANGE
(SSNKE) FACILITY**

Event Held at New Delhi on

18 April 2013



1. BACKGROUND OF SOUTH-SOUTH-NORTH KNOWLEDGE EXCHANGE FACILITY (SSNKE)

1. The Clean Energy Ministerial (CEM) is a global forum to share best practices and promote policies and programs that encourage and facilitate the transition to a global clean energy economy. CEM through its various initiatives aims to develop awareness and facilitate knowledge exchange among the G-20 countries in the areas of Clean Energy and Energy Efficiency. The 21st Century Power Partnership of the CEM aims to bring together the CEM member countries on issues relating to large-scale integration of clean low-carbon generation, distributed generation, renewable energy, energy storage, energy efficiency, demand response technologies through smart policies and programs that leverage smart grid solutions and clean energy technologies, while expanding electricity access and keeping costs to consumers low. These represent emerging areas where various member countries of the CEM have much to share with, and learn from each other.
2. To facilitate the learning process among developing nations as well as deriving relevant experiences from developed countries, the South-South-North Knowledge Exchange (SSNKE) Facility is proposed to be mainstreamed within the 21st Century Power Partnership. The SSNKE will create a platform for organizing knowledge exchange between the countries through specific instruments and activities.
3. The scope of the facility in the first year will comprise of exchange of knowledge and best practices between the CEM countries in the key thematic areas of clean energy technologies, market instruments, regulatory policy & institutional opportunities and innovative financing mechanisms. It will also entail pilot testing of different types of knowledge exchange instruments and monitoring the progress of proposed outputs and outcomes. The SSNKE facility will be a revolving facility with ownership being taken by the host country. Since the SSNKE facility's Secretariat will be hosted within the CEM Secretariat, the country which hosts CEM will take leadership of the facility's activities during the year. India being the host of CEM-4 will lead the SSNKE in its initial first phase of 2013-14.
4. The SSNKE concept recognizes the various bottlenecks and the need for institution development and the imperatives of exchange of experiences between countries in this regard. The knowledge exchange is proposed to take place between senior management and working level officials of different institutions. The proposal for the SSNKE facility was formally presented on April 18, 2013 on the sidelines of CEM-4 in New Delhi, for consideration by the CEM members. Starting with CEM-4 but continuing thereafter into the year to follow in CEM-5 in Seoul, the SSNKE will create a platform for knowledge exchange between peer groups in areas of identified priority.

5. The launch event of the SSNKE discussed the need for knowledge exchange among countries and elaborated the various aspects of the facility. The event was attended by a large number of clean energy sector experts & professionals (list annexed). The session was co-chaired by India (Mr. B.K Chaturvedi, Member, Planning Commission, GoI) and the US (Mr. David Sandalow, Assistant Secretary, US DoE). A formal presentation on the SSNKE concept and contours of knowledge exchange was made by Mr. Neeraj Prasad, Manager, the World Bank Institute (WBI). Post the presentation, the session included a panel discussion (including Ms. Jyoti Arora, Joint Secretary, MoP, Government of India; Mr. Jeung-Soo Huh, CEO, KEMCO, South Korea; Mr. Leonardo Beltran Rodriguez, Deputy Secretary, Ministry of Energy, Mexico and Mr. Anil Jain, Advisor, Energy, Planning Commission, Government of India) where panellists shared experiences on large scale integration of clean energy in their respective countries, successful & best practices, challenges & implementation barriers they face, and also articulated their learning needs for enabling accelerated deployment.

The SSNKE facility was welcomed by all the participating countries and organizations, both Indian and International.

2. SUMMARY OF ISSUES DISCUSSED

1. Importance of Leveraging Global Experience- The delegates emphasized on the need to promote knowledge exchange among different countries of the world, especially between the developing countries with similar economic setting.

Views were expressed as to how leveraging global experience could be an important step for countries to adopt new and innovative methods for a cleaner existence. It was discussed that among the G-20 nations, there is a substantial body of knowledge among member countries on each of the thirteen areas that CEM addresses. In order to leverage global expertise in the area of clean energy, knowledge exchange needs to take place between developing countries and relevant experiences need to be derived from developed countries like UK, US, Germany, Denmark, Spain and so on. Over the past 10 years, programs like CEM, clean energy solutions, tools of dissemination like the clean energy web based forums using World Bank's knowledge exchange platform are being used to promote clean energy development through collaborative learning.

2. Dove-tailing SSNKE initiative with 21st Century Power Partnership- The 21st century power partnership which aims to bring together countries to share their experiences in clean energy is a cross-cutting initiative under the CEM themes. To facilitate the learning process among developing nations as well as exchanging relevant experiences with developed countries, the

SSNKE facility is proposed to be mainstreamed within the 21st Century Power Partnership. SSKNE will provide a platform for having a stronger interaction in a sustainable manner amongst policy makers, regulators, technology experts, practitioners, civil society, finance professionals and the private sector of the CEM member countries in the areas of large-scale integration of clean energy, distributed generation, renewable energy, energy storage, energy efficiency, demand response technologies and smart grids.

3. India as a recipient and provider of knowledge - Being the host of CEM-4 and also the leader of the SSNKE in the first year, India has immense opportunity to benefit from this knowledge sharing platform. Views were expressed on India's role in the SSNKE. The speakers opined on areas where India can learn from other countries, including both developed and developing world. India can also offer useful lessons to other countries in some of the areas. As a developing country, India has taken significant measures for expanding renewable energy and energy efficiency - India is both a recipient and provider of knowledge in both these areas. Since countries like Mexico, South Korea and South Africa are active members of 21st Century Power Partnership, they can play a very important role in the knowledge exchange process including India.

- a. In the area of energy efficiency, India has initiated market driven frameworks for ensuring energy efficiency in the high energy consuming industries (PAT scheme). India has a very successful appliance labelling programme. Further, plan for large scale offtake of super efficient equipments through the SEEP programme is being embarked upon by the country. These can be offered as best practice by India to other countries.
- b. The Ministry of Power (MoP), Government of India is looking forward to energy efficiency experiences especially from countries like Mexico and South Korea and grid integration of renewable energy from countries like Germany and Spain, and is keen to enter into partnerships through MOU or any such formal arrangements with these countries.

4. Need for institutionalization of knowledge- Views were expressed on the importance of institutionalization of knowledge. The participants recognized the various bottlenecks and the need for institution development and the imperatives of exchange of experiences between countries in this regard.

- a. Particular focus of the knowledge exchange will be on institution development at the working level within research institutions, government organizations, academia and civil society organizations.
- b. It was discussed that in India, knowledge exchange needs to take place at the state level as most of the actual implementation of clean energy initiatives takes place at the state level.

- c. It would be useful for India to understand how other member countries have achieved institutional and human development objectives and have succeeded in institutionalization of knowledge. Priority key areas and interventions need to be identified and designed from start to finish. The activities under the identified areas should be comprehensive and cover multiple stakeholders. It was also opined that the participants in a program should not change midway during the program, and that participating countries should commit to the same.
- d. India's collaboration with countries like Mexico and South Korea should involve downstream practitioners and transfer of know-how straight to the institutions of these countries. India shall try and take them directly to the place where they need to be translated. India put forward the opinion that active practitioners should be involved as they carry firsthand experience and knowledge leading to constructive implementation of the knowledge exchange experiences and ideas.

5. Types of knowledge exchange instruments- The discussion also highlighted the importance of having the right mix of knowledge exchange instruments. Various knowledge exchange instruments that were mentioned include:

- a. Dialogues
- b. Face to face workshops
- c. Knowledge exchange through training programmes
- d. Virtual learning
- e. Study tours – these need to be undertaken when the programme is in the advanced stages
- f. Establishing communities of practice where practitioners can interface with each other

6. Experience of knowledge exchange in South - South countries-

Some of the successful knowledge exchange initiatives were discussed by the WBI during the session, which could be taken as learning experiences by other countries.

- a. In response to interest from Thailand, India's, Central Electricity Regulatory Commission (CERC) and the Bureau of Energy Efficiency (BEE) proactively helped in explaining the PAT/REC schemes. A carbon conclave was organised where the BEE in particular shared details like data management, stakeholder consultation, how they assigned targets, how they interacted with industry, etc. Video conferences as follow ups took place to understand specific issues. The sustained support has greatly helped in taking the Thailand's market based energy efficiency program ahead rapidly.

- b. In South Africa, telecom towers are being used as a source to fulfill electricity demand. In Africa where demand for electricity is high, challenges are also exponentially higher. Multiple stakeholders were consulted around the globe. Video conferences were set in Washington and webinars with 32 countries with 190 regional participants helped creating networks.
- c. South Korea hosted the knowledge exchange programme on energy efficiency, which was a part of the World Bank project on knowledge exchange. Similar initiatives with several international organizations could be organized for developing countries in Asia, Africa, Latin America and the Arab states.
- d. India has shared its programme on development of power in the rural areas and experience of SEWA (Self Employed Women's Association) with South Africa. SEWA is an organisation in India which sells energy efficient cook stoves and promotes the use of solar power. The knowledge exchange involved sharing their experiences with regard to the success of the program, bottlenecks faced, their know-how and the process of implementation of the program and how success was achieved.

The discussion focused on the importance of having knowledge exchange among countries which have similar level of development and therefore similar types of problems. These countries can share their experience more intensely and this can lead to better development and improvement.

7. Monitoring results of year 1 and measuring success- It was discussed that the performance of the first year needs to be tracked and measured consistently. The following questions were deliberated upon:

- a. How can success be defined?
- b. How would success look like?
- c. How to measure performance? Would this be measured through the number of workshops conducted or the number of people visiting abroad, number of papers published, investment decisions taken etc.

Mexico mentioned that it would be keen to assess the progress of SSNKE in the first year and reporting of the same in CEM-5. There were views which emphasized on giving more importance to achieving set targets. It was indicated that rather than emphasizing quantification of the progress made, the results of the knowledge exchange should be visible to all stakeholders.

8. Immediate next step(s) - During the session, the importance of establishing an SSNKE Secretariat within the CEM Secretariat was proposed as the immediate next step. Since the SSNKE facility's Secretariat will be hosted within the CEM Secretariat, the country which hosts CEM will take leadership of the facility's activities during the year. India welcomed the concept of SSNKE and emphasized the need to design the knowledge

exchange programs in a manner that the beneficiaries include the states where most of the implementation takes place. Some of the cross-cutting themes which emerged as shared priorities and areas where India and other countries are keen to enter into a process of knowledge exchange include grid integration of variable renewable energy (where India would like to participate as a knowledge recipient) and energy efficiency (where India is keen to participate both as a knowledge provider and as a knowledge recipient).

Annexure 1: Details of attendees

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Annexure 2: Specific opinions and remarks made by some key participants

Mr. Mohd Suleman, Secretary, Energy Department, Government of Madhya Pradesh

"This facility would serve a very meaningful purpose if the states are actively involved from day one, as, in India it is at the state level where actual implementation will take place."

Dr. Ketan Shukla Secretary, Gujarat Electricity Regulatory Commission (GERC)

"Knowledge exchange is extremely important but impediments such as the lack of will to implement certain key initiatives decelerate the process of knowledge exchange, for e.g. if RPO is implemented all over India, all targets will be met by 2020. Lessons can be learnt from Europe on storage and scheduling, experiences of successful implementation of projects and technology transfers."

Mr. Gopal Saxena, Chief Executive, BSES Rajdhani

"In SSNKE, active practitioners, who have gone through the practical route of implementation should be involved and then we need to identify the areas which can actually lead to constructive implementation away from academic forums."

Mr. Arent Doug, Executive Director, NREL

"National Renewable Energy Laboratory is the operating agent for the 21st Century Power Partnership and has developed a set of background documents comprising the vision, structure, etc. for this Partnership."

2. Point of view on GoI request to provide comments on proposed additional legal provisions for performance review of electricity regulators



Sandesh Kr. Sharma
Director (Legal)

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भारत सरकार
GOVERNMENT OF INDIA
केन्द्रीय विद्युत प्राधिकरण
CENTRAL ELECTRICITY AUTHORITY
विद्युत मंत्रालय
MINISTRY OF POWER
सेवा भवन, रामाकृष्णा पुरम
SEWA BHAWAN, RAMAKRISHNA PURAM

नई दिल्ली-110066, दिनांक :

NEW DELHI-110066, Dated :

6th June, 2012

No.CEA/E&C/3/51/2012-legal / 643

Dear Shri *Ashish*.

I take this opportunity to inform you that Government of India, Ministry of Power is in the process of making certain constructive amendments in the Electricity Act, 2003. The proposed amendments are in line with the suggestions of the Working Group on Power, constituted by the Planning Commission, for the formulation of 12th Five Year Plan under the Chairmanship of Secretary(Power), Govt. of India. One of the suggestions of the Group is introducing the performance review of the Electricity Regulatory Commissions established under the provisions of Electricity Act, 2003.

The amendments shall incorporate setting up of a multi-disciplinary body to review annually the performance of the Regulatory Commissions on the basis of Performance Evaluation Matrix to be notified by Govt. of India, Ministry of Power. The report of the body shall be submitted to the appropriate Government for taking further action in the matter. The suggestions have been deliberated upon by the Committee constituted by Ministry of Power under the chairmanship of Chairperson, CEA with members from Ministry of Power, State Governments and Power Utilities including private companies. The Committee desired that Central Electricity Authority may request the World Bank for their advice in the matter and sharing experience if such a performance review mechanism exist in other countries.

The proposed amendments are enclosed for your kind perusal.

With regards,

Yours sincerely,

(Sandesh Kr. Sharma)

Shri Ashish Khanna,
India Energy Section Head,
World Bank,
Hindustan Times House,
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New Delhi - 110001.

Decision taken in the meeting held on 13.03.2012 for proposed Amendment
in Electricity Act, 2003

Section No.	Existing Provision	Proposed Provision	Decision
89(6)- Performance review of Regulatory commission	New provision to be inserted	<p>The performance of the Regulatory Commissions shall be reviewed annually by a multi-disciplinary body on the basis of performance evaluation matrix and report to the Appropriate Government for necessary action. The Constitution of the body for the Central Commission shall be as under-</p> <ol style="list-style-type: none"> 1. Member (energy), Planning Commission- Chairperson 2. Member Technical, APTEL- Member 3. Secretary (Power), GOI- Convener 4. Three outside experts to be nominated by the Central Government -Members <p>Constitution of the body for State Commission shall be as under-</p> <ol style="list-style-type: none"> 1. Chief Secretary of the State Government/UTs – Chairperson 2. Chairperson, CEA – Member 3. Joint Secretary (Power) GOI or his representative - Member 4. Secretary, FOR- Member 5. Three outside experts to be nominated by the Central Government- Members <p>The Central Government shall devise the performance evaluation matrix and constitute a Monitoring Committee for the purpose through appropriate rule.</p>	<p>Consensus emerged that performance review of the Regulators through independent Committee is essentially required. The exact composition and other details may be examined and suggested by the Committee alongwith the draft formulation.</p>
176(2)		(z) to devise a matrix and constitute Monitoring Committee for the performance evaluation of CERC and SERCs	(z) This is consequential provision of proposed Section 89(6). It would be appropriately reworded after finalization of the said Section by the Committee.

Review of Regulatory Performance in the Electricity Sector: Desirability and Alternatives

Background: Government of India is in the process of making certain constructive amendments to the Electricity Act 2003. The proposed amendments are in line with the suggestions of the Working Group on Power, constituted by the Planning Commission, for the formulation of the 12th Five Year Plan. One of the suggestions of the working group is introducing periodic performance reviews of the Electricity Regulatory Commissions established under the provisions of the Electricity Act 2003. This was also one of the suggestions of the “*High Level Panel on Financial Position of Distribution Utilities*” that was led by Mr. V. K. Shunglu to assess the systemic factors for financial losses in electricity distribution.

A committee, constituted by MoP, under the chairmanship of Chairperson, Central Electricity Authority (CEA) has deliberated on various suggestions in this regard. The present proposal is for setting up of a multi disciplinary body to review annually the performance of the Regulatory Commissions on the basis of the Performance Evaluation Matrix to be notified by GoI. The report of the body shall be submitted to the appropriate government for taking further action in the matter. The committee has asked CEA to seek advice from the World Bank on the subject and also for sharing any international experience on such performance review mechanism in other countries.

Context: In the face of accumulated losses of around Rs. 2 lakh crores¹ in the distribution utilities across India, there is an urgent need to remedy the situation but also to understand the malady afflicting the system. Under the aegis of the Electricity Act of 2003, the legal, regulatory and technical systems have robust underpinnings. However, the revenue deficit across the distribution system due to under-recovery of electricity costs points to systemic challenges that encompass several technical, financial, regulatory and political economy issues. While the Electricity Act provides a detailed roadmap on how the regulators should function to achieve these goals, the performance of State Electricity Regulatory Commissions (SERCs) has been vastly inconsistent and varies across the states of the Union. State regulators (who are appointed by the State governments) have not fulfilled their expected role of regular tariff orders and ensuring compliance to improved customer service standards and there is lack of uniformity in application of regulatory principles in tariff orders across States. In order to maintain a broadly uniform regulatory environment in the country, the Electricity Act 2003 provides for bodies that can coordinate regulation, like the Central Electricity Regulatory Commission (CERC) and the Forum of Regulators (FoR), which has not led to desired outcomes as their role is more of providing guidance (than mandatory recommendations) to the State regulators. Decisions of the regulators can be appealed in the Appellate Tribunal, provided as the first forum for grievance redress in the Act. The Appellate Tribunal (authority above all regulators) has already ordered all regulators to *suo moto* rationalize tariffs even if tariff applications are not filed, as Electricity Act allows so.

International experience in regulation of natural monopolies: International experience on regulation of electricity, water, sanitation and other public services has shown that where just one or two utilities report to a regulator, the outcomes for the sector are not significantly different or superior to the original structure of public owned utilities. The regulatory system is most effective in jurisdictions where the sector is operated on commercial principles. Introduction of regulators without public disinvestment just leads to an additional layer in the process of decision making, increasing transaction costs without improving service or cost outcomes for consumers.

In federal states like Brazil and Mexico, a single national regulator oversees the operation of several tens of utilities, with a mix of private and state ownership. In Latin American developing countries like Chile, Peru and Mexico, regulation was accompanied by large scale privatization of electric utilities. These countries, as well developed countries like UK which followed the same model, have achieved high performance on capacity expansion as well as system efficiency (with less than 10% system losses). In Asian developing countries like China and Vietnam and even in developed countries like Germany, the regulation is light and sector is controlled largely by state owned agencies.

¹ Equivalent to Rs. 2 trillion, around \$40 billion

The state owned agencies have shown good performance on capacity expansion and system efficiency (leading to close to 100% electrification and less than 10% losses), all with limited independent regulation. *There is very limited international experience of successful independent regulation for a sector controlled by state owned enterprises.*

Examples of Regulator Review: Internationally, third party performance reviews, through consumer surveys or process or qualitative audits have been rare and far in between. Brazil's constitutional agency National Accounts Tribunal (TCU, the equivalent of CAG in India), conducts performance audits of the regulators, under the supervision of the national legislative body. These audits include verification of compliance with obligations set in the regulatory framework (periodic tariff reviews and adjustments, etc.), as well as other legal aspects (budget execution, expenditures, etc.). More details are available in the Annexes

Basis of managing regulator performance globally: Academic study of the performance of regulatory bodies has focused on three main aspects as success indicators of the regulatory design:

- Their **independence** from political authorities and the autonomy of their management,
- Their **accountability**, both to other branches of government and to the public,
- The **transparency** of both their rule- and decision-making procedures.

Strong transparency and public disclosure requirements are critically important for ensuring the process and outcome integrity of regulation. If the information is not proactively made public, process and performance cannot be monitored, leading to sub-optimal outcomes. Transparency and documentation of the process is important for timely regulatory orders and actions, through public scrutiny and media attention.

Lessons for India and the possible way forward

Electricity as a commercial activity: The letter and spirit of the Electricity Act 2003 was to move the country's power sector towards a commercial orientation, through corporatization. However, the implementation and manifestation of the law in the current state *does not follow the spirit of commercial operation*. It is critical for this sector to be allowed to operate on commercial lines, to achieve the desired objectives of economic efficiency, through high access, satisfactory service and low costs for consumers.

State owners need to exercise their property rights: No regulator can enforce or improve performance if the owners, in this case the State or state governments, do not exercise their property rights and do not push the sector to operate on commercial terms, leading to build up of huge revenue deficits and continuous deterioration in customer service. Regulatory agencies that are tasked with regulating state-owned enterprises through only financial incentives have very limited means of enforcement.

Regulation as a means of solving political and other sector challenges: It should be remembered that regulation, by definition, is *the activity to prevent the State and Society from harming Markets and Markets from harming State and Society*. It is a technical solution to several inter-linked challenges. However, regulation alone cannot overcome political barriers. Political problems need political solutions. Technical and regulatory solutions to political problems will always be sub-optimal.

Regulatory decisions are only one determinant of industry outcomes: Regulatory agencies are by no means the most important determinant of sector outcomes. Sector outcomes may be more affected by poorly designed market structures, inconsistencies in Government policy and/or government unwillingness to allow the regulatory agency to carry out its functions, and external pressures (e.g. macroeconomic and exchange rate crises). In the background of the current system, it is undesirable to create another body to oversee the functioning of regulators. Instead of creating another super-regulator, it is advised to use the existing institutions of the Government of India to provide oversight.

Given the record of sub-optimal outcomes of the regulatory system as reflected in the financial losses and inadequate technical performance, it is worth considering whether it is useful to look at the performance of the

regulators on an individual basis and undertake performance audits. In the existing system, regulatory decisions can face appeals in the appellate system of the Appellate Tribunal for Electricity (APTEL). Strong requirements for public disclosure and process documentation enshrined in the EA2003 have ensured that all processes, documents and judgments are available for public and civil society inspection. Regulators have technical support through the Forum of Regulators and other bodies.

Oversight or review of regulator decisions is a seemingly attractive but ultimately deleterious activity. Whether by design or intent, the presence of a *super-regulator* would inhibit the existing regulators, impinging on their independence and flexibility. Performance audits of specific judgments maybe unproductive, since that would tantamount to second-guessing the regulators. Process audits are best conducted through transparency and requirements of public disclosure of documentation in a timely manner.

In the plethora of regulatory and bureaucratic institutions in India, creating another body to perform such a function would not achieve the stated goals of efficiency in the governance of the electricity sector.

Possible solution for India's context:

The current regulatory system in India provides for significant **transparency**. On **independence**, the performance of regulators varies significantly across states, where only 26% of regulators are currently not dependent on state budgets to meet their expenditure needs. The selection process of regulators further limits their independence.

Looking at the international experience, **accountability** can be determined on following:

- (a) **Process review** for compliance to prescribed procedures;
- (b) **Quantitative review** based on benchmarks for performance of generation, transmission and distribution entities;
- (c) **Qualitative review** (like the performance audits being done in Brazil by TCU).

Following the principles of independence and transparency, the performance review matrix for accountability should be designed and monitored by a multi disciplinary body which has representation from regulators, policy makers, public and private operators as well as civil society. Since the country already has independent institutions like the APTEL, CAG etc., it would not be advisable to create an additional body and this multi disciplinary body can function within and under such existing institutions. This group will ensure compliance to existing mandates, benchmarking of regulators against others and periodic qualitative reviews. These benchmarks would be consolidated under a performance review matrix, with the help of the expert group.

This mechanism will allow an existing constitutional body (CAG or APTEL) to undertake oversight of the regulators, providing a level of review outside the judicial review system in the APTEL. Such a solution will require more consideration on time frames within which these reviews should be held, to avoid long-delayed processes.

Annexes:

1. *Principles of electricity regulation in Latin America* by Pedro Antmann, World Bank
2. *Assessing The Effectiveness Of Regulatory Performance* by Maria Vagliasindi, World Bank
3. *Strengthening of the Institutional and Regulatory Structure of the Brazilian Power Sector* by Ashley Brown and Ericson de Paula, Harvard University

Main Principles of Electricity Sector Reform in Latin America

Enactment of new regulatory framework explicitly defining main rights and obligations of regulated (monopolistic) entities in charge of transmission and distribution services

- - Distribution companies must meet all demand and provide adequate service in their zones of service
 - Transmission (T) and distribution (D) companies must give open access to their networks to authorized third parties
 - T & D companies entitled to charge fair and reasonable tariffs set by the Regulator, ensuring business sustainability (allowing to cover costs of supply and earn a reasonable return on investments) if it is efficiently managed
 - Regulatory agencies (RAs) set quality standards accordingly with concession or license contract and monitor effective fulfillment

New Regulatory Framework-Legal Foundations



- In almost all Latin American reforming countries the principles of the new institutional and regulatory structure of the electric sector were defined through specific laws.
- In several cases (Bolivia, Peru), the laws contain not only the principles but also the specific procedures (and even the formulae) to be followed for calculation of regulated tariffs (transmission and distribution).
- In the cases where the new sector law is including only the principles for tariff setting (Chile, Colombia, El Salvador), the specific procedures and formulae are contained in the regulatory decrees and license or concession contracts.
- In order to give more juridical certainty to investors, some key articles of the law and regulatory decrees are included as part of the concession or license contract. They will stay valid for these contracts even if repealed as norms of general application.
- The whole set of norms (law, decrees, concession or license contracts) is:
 - In all cases fully public
 - In general **very specific** (limited flexibility for discretionary interpretation by involved agents, in particular regulatory agencies).

New Regulatory Framework-Legal Foundations



- **Transparency principle applied in all reforming countries: all what an agency responsible for regulation (economic and service quality) of a monopolistic service does must be public**
- In **all** Latin American reforming countries:
 - A single national electricity regulatory agency (RA) was created (even in Federal countries like Brazil).
 - Congress involved in approving budget and appointment of Directors of the RA. For monitoring and auditing purposes the agency is considered as an entity of the national (central) government
 - **Private sector participation (PSP) was incorporated in at least electricity distribution.** Thus, in general the RA regulates a big group of both private companies and SOEs (Brazil, Colombia, Peru, El Salvador) applying the same principles, rules and procedures to all of them.
 - Full disclosure (publicity) of regulatory documents, processes and activities, together with multiplicity of regulated companies (private and SOEs) tend to promote independency and accountability of the RA
 - The RA is permanently monitored by sector agents, government, NGOs representing consumers, entities auditing government agencies, etc. As everything is public, they don't need to ask "what is happening" but "why is this happening".

The Regulatory Process and Related Time Schedule



- Multi-year tariff (MYT) regime for economic (price setting) regulation
- Duration of regular control (tariff) periods is usually 4 or 5 years
- **Stability of tariff charges and any other relevant operational parameter** is the basic rule within any specific control period:
 - Tariffs are adjusted **only** according to changes in pre-defined parameters (i.e. inflation, depreciation of local currency, changes in bulk supply prices) and applying pre-defined formulae.
 - The time schedule of adjustments is also pre-defined
 - Once the Regulator sets the tariffs for each period, he becomes “hand tied” until following price control and must focus in the permanent task of monitoring service quality and enforcing related regime of penalties/incentives

The Regulatory Process and Related Time Schedule

- Predominant approach (applied in Chile, Colombia, El Salvador, Panama, Peru): distribution companies must prepare and submit to the Regulatory Agency (RA) their proposal of tariffs to be applied for each control period, based on technical studies developed according to principles and methodologies set in the sector law, decrees and regulations.
- Sector law or decrees require that all the technical studies for preparation of the proposal must be performed by specialized consultants, which are previously pre-qualified (EOI) and evaluated by the RA through a quality-cost based selection (QCBS).
 - The RA holds the highest evaluated company as its own consultant
 - Regulated companies must choose other pre-qualified consultants
- The RA may prepare its own proposal and decide between both or perform a technical review the proposal presented by the regulated utility.
- Process usually starts around 8 months before beginning of the control period in most of the countries

The Regulatory Process and Related Time Schedule



- In Brazil the proposal on tariffs for the following period is prepared by the RA (ANEEL) for each transmission (53) and distribution (64) company on a case by case basis.
 - Each tariff review process is fully conducted by ANEEL (from beginning to end), and starts around 8 months before commencement date of the following tariff period (specifically defined in each fully public concession contract)
 - As prescribed in the law creating ANEEL, each proposal is discussed in a public consultation process (including a public hearing)
 - All the documents related to the process are fully public (contributions from stakeholders, responses by the RA, decision and elements supporting it, etc.). There is a specific address for each process in the RA's website, created when ANEEL's proposal becomes public.
 - Currently all meetings of ANEEL's Board of Directors of the electricity regulator (ANEEL) are public and live webcasted (regardless of the matter).

Monitoring performance of Regulatory Agencies

- Entities in charge of auditing performance of government agencies are vested with the competence to monitor RAs (no special treatment).
- Auditing process simplified by full publicity of activities carried out by the RAs (reinforced by laws prescribing publicity of activities of all government entities recently approved in several countries)
- Audits always include verification of compliance with obligations set in the regulatory framework (periodic tariff reviews and adjustments, etc.), as well as other legal aspects (budget execution, expenditures, etc.).
- Audits in general exclude technical aspects of decisions taken by RA. The exception is Brazil:
 - The “National Accounts Tribunal (TCU)” analyzes (during each process and also “ex-post”) the proposals made and decisions taken by ANEEL.
 - But in this field the TCU is just one stakeholder, without specific legal competences

Monitoring performance of Regulatory Agencies

- Disputes on technical aspects of decisions taken by RA within the framework of a certain regulatory process usually involve the RA and one or several regulated companies
- Some countries (Chile in the second wave of reforms started at the beginning of the 21st century) adopted a “quasi-judicial” model:
 - “Ad hoc” Expert Panel (EP) arbitrates on the substantial technical aspects of the decision
 - Members of the EP are appointed following the classic approach for arbitration: each party appoints one member and the two appointees agree on the third member, who becomes the Chairman of the EP.
 - Decisions taken by the EP or AT are final and binding for involved parties (similar to arbitration)

Key aspects promoting effectiveness and accountability of Regulatory Agencies

- **Publicity of each and all the steps of each regulatory process:** 3 basic principles of regulation of monopolistic services by Ashley Brown: (i) transparency; (ii) transparency; (iii) transparency. This is substantially more comprehensive than just having a “website”.
- **Private sector participation in the regulated services:** no successful cases (and several failed ones) in LAC experience of RAs effectively exercising their competences if all the regulated companies are SOEs
- **Multiple companies (private and SOEs) under the jurisdiction of a single RA:** combined with publicity makes impossible “capture of the regulator by the regulated entities”
- **Multi-year tariff (MYT) regimes** providing incentives to responsive regulated companies (all private and some SOEs) to beat regulatory allowances on key efficiency parameters (operating costs, total losses, etc.), as they are entitled to keep the related additional revenues as profit until the following price control:
 - If tariffs are discussed every year, discussions on allocation of increased efficiencies among regulated companies and their customers are futile exercises about percentages of inexistent amounts.

Key questions involving Regulatory Commissions in the electricity sector of India

- **1- Is action of state regulatory commissions (SRCs) a key aspect affecting performance of state-owned enterprises (SOEs) providing monopolistic services (T&D) in India?.**
 - 1.1- Are there specific cases of SOEs in emerging countries whose performance substantially improved after a RC was created?:
 - 1.2- Are there specific cases of SOEs in emerging countries whose performance substantially improved without the incorporation of a RC?

- **2- What is the main failure in performance of SRCs?.**
 - 2.1- Do they fail to exercise their competences (issuing tariff orders, monitoring service quality, etc.)?
 - 2.2- Resolutions by SRCs are not actually enforced? (they are just “pretty poetry”, as mentioned in Tenenbaum’s report))

- **3- Why RCs in emerging countries usually fail to become “real regulators” when only SOEs provide monopolistic services?**
 - 3.1- Is the “same boss” or “family business” situation actually relevant?
 - 3.2- How can the “boss” become sensitive to bad performance of SOEs and promote and lead actions to improve it?

-

Proposed answers to key questions involving Regulatory Commissions in the electricity sector of India

- 1- Is action of state regulatory commissions (RCs) a key aspect affecting performance of state-owned enterprises (SOEs) providing monopolistic services (T&D) in India?. **NO**
 - 1.1- Are there specific cases of SOEs in emerging countries whose performance substantially improved after a RC was created?: **NO**
 - 1.2- Are there specific cases of SOEs in emerging countries whose performance substantially improved without the incorporation of a RC? **YES, THROUGH SPECIFIC "MANAGEMENT IMPROVEMENT PROJECTS"**
- 2- What is the main failure in performance of SRCs?.
 - 2.1- Do they fail to exercise their competences (issuing tariff orders, monitoring service quality, etc.)? **IN SOME CASES**
 - 2.2- Resolutions by SRCs are not actually enforced? (they are just "pretty poetry", as mentioned in Tenenbaum's report) **IN MOST CASES**
- 3- Why RCs in emerging countries usually fail to become "real regulators" when only SOEs provide monopolistic services?
 - 3.1- Is the "same boss" or "family business" situation actually relevant? **ABSOLUTELY CRITICAL**
 - 3.2- How can the "boss" become sensitive to bad performance of SOEs and lead actions to improve it? **PROMOTE SOCIAL PRESSURE FOR A BETTER SERVICE**

Assessing the effectiveness of Regulatory Performance

1. Relevance of Electricity Regulation

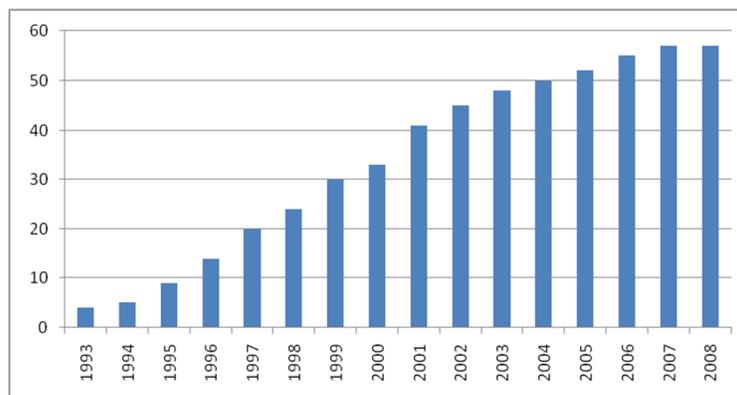
Electricity distribution networks are highly capital intensive systems and timely investments to maintain and upgrade the assets are crucial for long-term reliability and expansion of their service. Much of the assets to transfer electricity (overhead lines, cables, switchgear, transformers, control systems and meters) have long economic lives and become sunk. Also, distribution networks have a diverse set of customers in terms usage level as well as consumption patterns. As demand for electricity service continues to increase the existing networks need to gradually be replaced and expanded and the electricity utilities requires additional investment.

Regulators are in a position where they decide what level of capital and operating expenditure is reasonable and also what the allowed rate of return should be on regulated assets. In distribution these three elements represent around one third each of the total regulated revenue.

The main aim of electricity regulation is to provide utilities with incentives to improve their operating and investment efficiency and at the same time to ensure that consumers benefit from the gains. However, despite progress in economic regulation of networks in recent years, devising suitable incentives for network investments still remains a work in progress and a challenge for many regulators (see Joskow, 2008, Ofgem 2010).

The number of developing countries that have established electricity regulators have been growing substantially, raising from less than 10 in 1995 to about 60 since 2008.

Fig. 1 Cumulative number of autonomous regulators in developing countries



Source: Vagliasindi (2012)

2. Literature on regulatory governance

The economic literature has focused on three main aspects of the regulatory design: a) their independence from political authorities and the autonomy of their management, b) the mechanisms to make them accountable (both to other branches of government and to the public), and c) the transparency of both their rule- and decision-making procedures. Within these categories, indicators range from simple measures to determine, for instance, independence (such as the legal instruments that created the agency) to more sophisticated mechanisms aimed, for example, at improving the quality of regulation (such as Regulatory Impact Analysis).

Research on the regulatory governance of electricity agencies has evolved and changed. Despite the original focus on independence, a growing body of literature has been using more comprehensive approaches to address their institutional design. Good examples of this trend are the works of EBRD (2004), Correa *et al.* (2006), Brown *et al.* (2006), and Andres *et al.* (2007), which approach the assessment of independent regulatory agencies through the classic lens of autonomy, transparency, and accountability, but include a wide array of indicators within these variables as well as innovative tools to understand and assess their functioning. Furthermore, this literature focuses not only on the formal aspects of regulation (provisions existing in agencies' statutes and laws) but also on informal regulation (aspects related to the implementation of the provisions' components). This approach is useful as it recognizes the broad nature of the role of regulatory agencies: they are not only institutions responsible for driving investment in infrastructure but also are decentralized administrative bodies in charge as such of delivering public service to citizens.

Correa *et al.* provide a detailed analysis of Brazilian regulatory agencies. The authors select four aspects of agencies' governance and, based on information collected through surveys, construct three indexes. The first index, the Regulatory Governance Index, is the base-line indicator and represents the most comprehensive dataset of all the indexes. The second index, the Parsimonious Index, captures those variables of the survey that are less subjective. The third index, the Facto Index, is related to actual practices of regulatory agencies. The report finds that independence and accountability are more developed than regulatory means and instruments (particularly qualified personnel and regulatory tools) and decision-making procedures (particularly with respect to those mechanisms that can guarantee consistency of decisions and reduce arbitrariness). It also finds that there is a clear difference between federal and state regulatory agencies, with the former achieving higher results in the autonomy, decisionmaking, and decision tools components of the Regulatory Governance Index.

Brown *et al.* (2006) develop a framework to assess the effectiveness of a regulatory system. They aim to provide the policy-maker with different types of evaluations (quick, mid-level, and in-depth) to carry out these assessments. The authors include aspects related not only to the governance of the regulatory system (independence, transparency, and accountability of the regulator) but also to the substance or content of the regulation (decisions about tariff levels and structures, network access conditions for new and existing customers). Using the independent regulator model as the benchmark of analysis, they select 10 principles that should be followed in order to create an independent regulatory agency. The principles are accompanied by standards that establish the details for their implementation.

Andres *et al.* (2008) evaluate and benchmark electricity agencies of the region based on four main attributes of their governance: autonomy, transparency, accountability, and tools/capacities.

3. Links between regulatory governance and performance

Regulatory decisions are only one determinant of industry outcomes. Regulatory agencies are often by no means the most important determinant of sector outcomes. Sector outcomes may be more affected by poorly designed market structures (California, Ukraine), inconsistencies in Government policy and/or government unwillingness to allow the regulatory agency to carry out its functions and external pressures (e.g. macroeconomic and exchange rate crises).

The introduction of regulation, particularly incentive regulation regimes based on RPI-X models and benchmarking, has in most cases improved the efficiency of network utilities. The recent literature on regulatory governance for utility service industries has been pioneered by Levy and Spiller (1994). More recently there has been more systematic evidence that better regulatory governance increases efficiency.

Many recent studies show that having a regulatory agency is significantly associated, either directly or indirectly, with higher capacity and higher labor productivity. Cubbin and Stern (2006) made an econometric analysis of the relationship between the quality of regulatory governance and the level of generation capacity per capita and some efficiency measures for a sample of 28 Latin American, Caribbean, Asian and African countries over the period 1980-2001. Andres et al. (2008) suggested that the mere existence of a regulatory agency, regardless of the utilities' ownership, has a significant impact on performance.

Attracting significantly higher private investment has been quoted as one of the most important reasons for the promotion of independent regulatory agencies in electricity both in the policy and academic arena. In addition, the existence of an effective regulatory framework can also encourage the growth of private investment and/or private finance within the public sector, as has been happening in recent years in India and China. Whereas the mere existence of regulatory agencies have significant impacts on the likelihood to attract private investment over time it did not significantly affect the level of investment (Vagliasindi, 2012).

Few studies assess the relevance of different regulatory dimensions on performance. Vagliasindi (2010) shows that regulation governance is only marginally linked to access, which is not surprising given that most sectoral policies are outside the control of regulatory authorities. Among the regulatory subdimensions, accountability and quality of the regulatory tools are most closely linked to higher performance. Regulatory tools (rated by the existence of a tariff methodology and a periodic review process) are characterized by a strong correlation with the operational and financial performance of utilities in the electricity sector.

Table 1. Correlation between Regulation and Performance

	Access	Quality	Operational	Financial
Regulatory Scorecard	0.13	(0.49)	0.32	0.10
Autonomy	0.22	(0.27)	0.38	0.59
Transparency	0.20	(0.27)	0.34	0.32
Accountability	0.30	(0.36)	0.62	0.07
Tools	0.25	(0.37)	0.75	0.86

Source: Vagliasindi (2010)

4. Challenges of SOE Regulation

Regulation is but one dimension of governance, and it may not be the most powerful mechanism to improve SOE performance. Notably, strong theoretical reasons suggest that public and private enterprises respond in different ways to the same regulatory incentives, and some evidence from developing countries shows this to be the case (see Berg, Lin, and Tsaplin, 2005). The Ukrainian electricity market represents a good laboratory to examine the differential impact of regulation on SOE vis-à-vis the private sector. In May 1998 the National Electricity Regulatory Commission (NERC) adopted a price setting methodology for electricity distribution and tariff supply. NERC expected this methodology to create a strong incentive for profit maximizing utilities to reduce losses. It set an allowed level of line losses (normative technical losses) in the retail electricity price and charged it to all consumers. Reduction of losses below the allowable level gives electricity utilities greater cash flow, and excessive losses produce lower cash flows. Thus, the system rewards enterprises that successfully address the issue of under-loading, deferred maintenance and commercial losses due to non payment and theft. SOEs were less motivated to increase cash flows due to lack of managerial motivation (low salary) which

implied that they did not respond as effectively as private ones to incentives associated with reduction of technical and commercial losses. The results conformed to these expectations. Vagliasindi (2011) confirms the lack of effectiveness of SOE regulation for a sample of countries in Eastern Europe, East Asia, Sub Saharan Africa and Latin America.

Regulating SOEs is very different from regulating a privately owned utility. For example, many tariff setting mechanisms presume that the regulated entity that will respond to economic incentives. But that is probably not a reasonable assumption for a state-owned enterprise. For example, it is doubtful that a tariff setting system that attempts to get better performance through overall economic rewards and penalties for the enterprise is going to be very effective unless there is some mechanism to ensure that these rewards and penalties flow through to employees.

In the case of public enterprises, the use of "sticks" (penalties) can be problematic and, on the other hand, "carrots" may not translate into incentives within the organization—given civil service salary constraints, as the evidence reported in Berg and Muirwe (2006) shows. In other words, the rewards and penalties of the tariff setting system have to be better targeted to have an impact of SOE behavior. How can a country make regulation of SOEs more effective in enhancing performance, and how might it assure that the regulatory framework translates into the firm's internal reward systems?

What about the effectiveness of performance contracts?

Performance contracts are negotiated, written agreements that clarify objectives of governments and motivate managers. Performance contracts typically include approval of business plan and specify a number of key performance measures and indicators. By introducing ex post evaluated targets— can reduce ex ante controls and provide incentives to managers to do what is necessary to achieve targets.

Performance contracts do not always reduce the information advantage that managers enjoy over owners and Managers negotiate targets that are hard for outsiders to evaluate or easy for the utility to achieve

Each year, Eskom (the South African state owned electricity utility), in consultation with the minister of public enterprises, aligns its performance objectives, measures, and indicators with treasury regulations under the PFMA. The annual targets are consistent with a list of principles agreed upon by Eskom and its shareholder, under the shareholder compact.

About half of the key performance indicators were not met in 2008, due to below-target financial performance and investment efficiency, both in capital and operational expenditure. This inability to meet targets provided an important warning sign of the imminent crisis.

Table 2 Eskom Performance Target and Actual Indicators in 2008

Key Performance Indicators	Target	Actual	Performance
Financial Performance			
Rate of Return on Capital (ROC)	>6.1	5.4	Not achieved
Earnings before interest and tax margin (EBIT)	>11.5	9.2	Not achieved
Capex (Capital Expenses) Efficiency			
Generation capital expenditure (Rand million)	>9,940	11,004	Exceeded
Transmission capital expenditure (Rand million)	>2,171	2,394	Exceeded
Generation technical plan expenditure (Rand million)	>3,703	3,461	Not achieved
Generation capacity installed and commissioned (MW)	>1,041	1,061	Exceeded
Transmission lines installed (km)	>270	246	Not achieved
Transmission installed (MVA)	>295	1,295	Exceeded
Distribution capital expenditure (Rm)	>3,476	3,886	Exceeded
Opex (Operational Expenses) Efficiency			
Major incidents (system minutes lost)	≤ 1	6	Not achieved
Severity degree one (>1 but less than 10)	≤ 1	5	
Severity degree two (>10 but less than 100)	0	0	
Severity degree three (>100)	0	1	
System minutes lost (<1 system minute)	≤ 3.90	3.56	Exceeded
Unplanned capability loss factor (%)	≤ 4.50	5.13	Not achieved
System average interruption frequency index (SAIFI)	≤ 22.8	33.72	Not achieved
System average interruption duration index (hours per annum)			Exceeded
Operating cost per megawatt hour (R/MWh)	≤ 183.00	189.25	Not achieved
Socioeconomic Factors			
Eskom trainees and bursars (number)	≥ 4,000	5,368	Exceeded
Number of engineering trainees/apprentices	≥ 3,000	4,563	Exceeded

Some innovative tools might align internal and external incentives. In this respect, the regulator may play a constructive role. For example, the performance contract between the Government of Mozambique (GoM) and Electricidade de Mozambique (EDM) is equivalent to a partial “regulatory contract.” It specifies financial, operational and investment performance that the GoM expects EDM to achieve over a three-year period. However, it is not a normal commercial contract because the obligations are mostly one-sided (on EDM), and there are no explicit rewards and penalties apart from the ability of the Government to replace the EDM President and Executive Board. When the regulator (CNELEC) monitors EDM’s performance under the contract, it acts under instructions issued by the Ministry of Energy and the Ministry of Finance. Mozambique attempts to use a regulator to publicly monitor the

performance of state enterprise under a performance contract. “Public monitoring” means that the general Mozambican public will be informed of the contents of the periodic evaluations of EDM’s performance that are made by CNELEC.

Additional strategies to adapt regulatory rules to SOEs include avoiding taking on “too much, too soon”, in terms of objectives related to cost recovery achieving public confidence through “early wins” and transparency for both the utility and the regulator, and developing capacities for quality of service regulation, in addition to price regulation. This may help to make effective regulation that lead to higher cost recovery level more acceptable to citizens who end up paying higher prices.

Finally, reform should include strengthening the quality and availability of governance indicators, a strategy which can help reduce the incidence of corruption and enhance accountability and transparency, particularly toward the most vulnerable users of infrastructure services.

5. Assessing Regulatory Governance Performance

The outputs of regulatory system are regulatory decisions. Regulatory decisions refer to any action or inaction that materially affects the interests of participants in the regulated sector – consumers, producers and investors.

Good regulatory decisions protect (current, potential and future) consumers and help establish and maintain sustainable commercial operation, help achieve government policy objectives (e.g. connection targets, fuel diversity goals, efficiency targets, etc.) and can also help reveal inconsistencies in government objectives.

Bad regulatory decisions can be divided into:

- Omission (Failures to ... investigate and understand cost structures, institute adequate quality of service indicators, define regulatory methodologies, etc.)
- Commission (Unreasonably ... setting inappropriate benchmarks, allowing growing divergences between costs and prices, setting low penalties for serious offenses, etc.)

Good regulation does not always produce good outcomes for the regulated sector, but bad regulation will almost always contribute to bad outcomes.

Regulation should always be kept to the minimum necessary to assure efficiency and fairness. For example, economic and social Benefits exceed the likely economic and social costs only where significant market power exists, where consumer protection requires it, where clearly specified, government-mandated social policy is most efficiently carried out by regulation

Where regulatory actions are necessary, they should be:

- Well targeted
- Proportionate to the problem being addressed
- Measured against the alternatives

In what follows we report best practice principles on conducting regulatory assessment of performance

- **Conduct hearings to review the agencies’ performance**
Legislative committees and/or relevant ministries and executive task forces periodically conduct hearings to review the performance of regulatory agencies.

The issues that should be covered include oversight of regulators, on a prospective basis, which should be exercised by policymakers who possess the authority to make meaningful and binding changes. That generally translates into the need for both legislative and executive officials to be involved in the process of oversight. Conducting the review at that level has the positive effect of permitting effective review not only of the performance of the regulators themselves but, perhaps even more importantly, of the entire regulatory system, including laws, methods, processes, and other issues, both broad and narrow.

Such a process will produce two major benefits.

The first is that it will encourage stakeholders to periodically focus inward on the regulatory process and evaluate their own performance and obtain the input of others on how things might be improved.

The second is that the mere existence of a formal, periodic review process will help channel discontent with regulators into productive, less disruptive directions than might otherwise occur.

- **Hire outside experts to prepare reports on the agency's performance or other special topics**
The government or legislative authorities should periodically engage the services of a panel of financially disinterested "outside" experts (which could include international experts and regulatory staff from neighboring or similar countries) to prepare a report on the overall performance of the agency, or on specific areas of interest.

One very useful way of reviewing the regulatory regime, including but not limited to the performance of the regulators themselves, is to engage the services of financially disinterested, outside (international) experts to prepare periodic, public reports that analyze various aspects of the regulatory regime. Such outside perspectives allow for new ideas and ways of doing things to be brought into the system. They also allow regulators and policymakers to look at regulatory matters from different points of view, and provide useful guidelines for the future from international experience.

- **Conduct periodic audits**
Regulatory agencies should be subject to periodic management audits and to other types of effectiveness review (for example, policy audits).

Regulatory agencies are no different from other types of organizations in the sense that they are well served by having their operations periodically evaluated by outside auditors (that is, consultants) who can evaluate the agency's organization, processes, and relations with the public and with other parts of government. Such consultants also have the advantage of being able to interact more freely with the participants in the regulatory process than the regulators themselves can ordinarily do. This allows them to look at the agency from both the inside and the outside.

Similarly, outside consultants can conduct policy audits as well. Policy audits can evaluate the consequences of pursuing a particular policy or course of action. These types of analyses are useful for both policymakers and regulators because they permit a disinterested analysis of issues in which partisans on various sides make contentions, often very loudly, that may or may not be true.

The use of management or policy auditors, or both, can also be quite useful in enriching the entire regulatory culture by adding new and differing perspectives and by performing professional, unbiased analysis of issues being debated within regulatory circles.

THE WORLD BANK

PPIAF PROJECT FOR BRAZIL POWER SECTOR

**TASK 4: “STRENGTHENING OF THE INSTITUTIONAL AND REGULATORY STRUCTURE OF
THE BRAZILIAN POWER SECTOR.”**

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INTRODUCTION

The purpose of the Public Private Infrastructure Advisory Facility – PPIAF – application is to provide support for the Brazilian government, with particular emphasis on the most urgent issues to be dealt with. If the work produced by international and Brazilian consultants under the tasks listed below results in workable solutions, ANEEL and other sector entities would take the lead in implementing solutions with their current or proposed legal authority. The focus of this work is on Task 4, “Strengthening of the institutional and regulatory structure of the Brazilian power sector.” Depending on financial resources, a second work will be developed with a wider view of the institutional structure and its other main actors.

During the week of August 5-9, 2002, both consultants conducted 21 interviews with different actors of the Brazilian energy sector (see attached working agenda – Appendix 1). The first meeting was with ANEEL, and focused on the agency’s views of where the consultants could be of greatest use, what interviewees should be added to the list presented, and clarification of the terms of reference. Although the interviews were not necessarily limited to the original list of topics, the attached document “ANEEL Queries” (see Appendix 2) constitutes the questions posed by the terms of reference. A second round of 18 meetings was held during the week of October 10-15, including conferring again with ANEEL (see attached working agenda – Appendix 3). In addition, there were a few supplemental interviews conducted by telephone.

A draft report has been prepared by the two consultants and sent to the coordinators at the World Bank and will be presented to ANEEL in late November.

Following this, a meeting with the interviewees, staff of ANEEL, and World Bank, together with consultants, will be held at the World Bank offices in Brasilia on December 11, to review the main points.

Recent Developments in the Restructuring of the Brazilian Energy Sector

The process of reform and deverticalization is mainly based on Law 8.987/95, of the Concessions of Public Services and on Law 9.074/95 which provides independent power producer and private investors with the opportunity for participating in the generation and distribution business, through bidding processes. Also of great importance is Law 9.427/96 which created ANEEL, the power sector regulator with the responsibility for promoting competition and regulating residual monopolies.

This proposed restructuring set out to divide the electricity industry into competing generators, high-tension transmission service, energy distributors, and free consumers and traders. The new model envisioned electricity as a commodity sold on the open market. To this end, Law 9.648/98 created the MAE (Mercado Atacadista de Energia) and the ONS (Operador Nacional do Sistema), which provided a new dynamic for the sector, with a new market structure and greater commercialization. These new structures also established the rules governing competition and created conditions to optimize the operation of the system, which is more than 90% hydro-based.

Privatization of state owned assets and solicitation of private investment for system expansion was a central element of the restructuring. In fact the Brazilian power sector privatization was, unlike in many countries, implemented before regulation was in place and before there was a market structure. Many items, such as tariff methodology, which is other countries, were defined in considerable detail in either concession documents or in the law,

were left more open in Brazil. Indeed, the concession documents use the word, repositioning, with no further definition, to describe what will be done with regard to tariffs after the expiration of the term set for the first tariffs. Thus, the task for subsequent regulators was not as well defined as was the case elsewhere, and the burdens of making regulatory decisions and the stakes involved was heightened substantially. While the issues that followed from this deficiency is the subject of this report, it is an important element of the context of the document as well as an indication of issue with which ANEEL will continue to have to contend unless a future government decides to propose amendments that would add more clarity and certainty to the tariff setting system for distribution entities.

Privatization began in the distribution sector. Private ownership of the distribution sector, measured in load, has gone from 2% in 1994 to 70% today. Much of the distribution sector which remains under state ownership is in such large vertically integrated (at least in part) companies such as CEEE, COPEL, CELESC, and CEMIG. In generation, however, only 30% of capacity is privately owned today. Efforts to bring more private investment into generation have been stymied by a variety of factors. Recently, the government has been developing a process of strategic partnership between para-statal enterprises and private investors in order to expand the energy supply with greater private investment.

The 2001 Energy Crisis

In April 2001, Brazil faced its worst ever energy crisis, caused by the drying up of its reservoirs due to a combination of five years of low rainfall and delay in the construction of new power plants. Lack of investment in generation and transmission system also significantly contributed to the shortfall in supply. The actors involved in privatization focused more on fulfilling that mission than they did on planning and sufficiency of supply

to meet growing demand. The latter concerns were critical to personnel in the power sector, but their concerns were never adequately integrated into the privatization process. In short, there was a fundamental disconnect between those with privatization responsibilities, and those entrusted with planning for future supply.

To deal with the crisis the President created the National Chamber for the Management of Energy Crisis (GCE) through a Provisional Measure on May 10, 2001, with the purpose of managing the energy supply crisis in the Southeast and Northeast. The GCE, in effect, took over the oversight of the power sector and effectively, although only for the duration of the crisis, preempted the National Energy Policy Council (CNPE), ANEEL, and other institutions with oversight responsibilities. One of the most dramatic steps taken by GCE was to order the rationing of electric energy in order to effect a 20% reduction in consumption. Earlier this year, after the reservoirs had been restored to sufficient levels, the rationing program was terminated.

At the conclusion of the crisis, GCE transferred its activities to the Ministry of Energy, with the publication of the Energy Sector General Agreement (under Law 10.438) that compensates the generators and distributors for losses due to rationing. The GCE finally presented 33 measures identifying the problems and imperfections in the design and implementation of the original reform model, in order to bring back investment and increase energy supply, of which 11 were considered priority measures and will be effectuated this year:

- Implementation of price methodology
- Commercialization of energy supplied by state companies
- Requirements for bilateral contracts
- Exchange at Normative Value – VN

- Incentives for natural gas thermal power generation
- Free and captive consumers
- Deverticalization
- Limits to cross participation and self-contracting
- Breakdown of distribution tariffs
- Tariff alignment and
- Tariff review criteria

With the end of the crisis and the restoration of full authority to the permanent institutions with oversight responsibility for the power sector, it is only natural to reexamine aspects of the oversight regime that pre-existed the crisis. With this in mind, as well as a desire to assist the Government of Brazil, The World Bank, through the Public-Private Infrastructure Advisory Facility (PPIAF) facility, has undertaken to assist the effort. This report is only one part of the PPIAF endeavor. The other tasks undertaken are reform of the power market and conception of the auction design, reviewing distribution tariff methodology, reform of the power purchase pass through arrangements, and reviewing discount programs for low-income customers. The purpose of the task addressed in this report is to strengthen the institutional arrangements in the regulation of the power sector. The emphasis is on regulatory governance as opposed to specific regulatory decisions. *Therefore, no effort has been made to evaluate the merits of any regulatory decisions taken, nor is any criticism of such decisions implied.* Instead, the focus is on analyzing developments from an institutional perspective and to make recommendations that will hopefully contribute to improving in the operations of power sector regulation.

One final introductory matter is to note that the focus of this report is on substantive matters. The form of implementing the recommendations being made is intentionally left open. To the extent that

implementation requires changes in the law, the authors are not position to make the technical, legal, and political judgments as to whether the changes should be made through a Medida Provisoria, or Congressional enactment. In some cases, on less fundamental matters perhaps, action by MME, CNPE, judicial authorities, or perhaps by ANEEL itself, might suffice. *The critical principle to be followed in making such a determination, however, is that the form of implementing the recommendation be the one best suited to making it permanent and binding.*

RECOMMENDATIONS

For the reasons fully explained in the Analysis below, the following Recommendations are made:

- 1. ANEEL should be provided with authority under the law to establish its own hiring practices, or at least, allowed the flexibility to deviate from generally applicable practices, where the skills and expertise required are unique.**
- 2. ANEEL should be enabled to establish compensation packages for employees which are either benchmarked to the levels of compensation paid by regulated companies, or, at least to allow ANEEL salaries to be comparable to other government agencies whose compensation is in excess of generally applicable government pay scales (e.g. Banco Central).**
- 3. ANEEL must be permitted to hire staff on a permanent basis.**
- 4. Directors and Staff of ANEEL should, for a period of one calendar year from the date of leaving ANEEL, be legally prohibited from employment of any kind, including on a consulting basis, which relates in any way to matters pending at ANEEL. In regard to those specific matters on which a person worked while at ANEEL, the prohibition should be of lifetime duration.**
- 5. Relevant legal instruments be amended to list the professions from which Directors must be drawn. At a minimum those professions should include economics, law, engineering, and accounting. No more than two Directors can be drawn from the same profession.**

- 6. The law should be amended to state that ANEEL, while continuing to be authorized to collect 0.5% of the electricity revenues, would have to undergo precisely the same budget approval process to which other parts of the government are subject. If ANEEL's approved budget amounts to less than 0.5% of electricity revenues, then the difference between expenditures and collections should be subject to the measures set forth in Recommendation 7.**
- 7. The second measure is a prohibition, written into the law, against those funds being diverted to other use by the Government. If the Government decides to make across the board cuts in spending and apply them to ANEEL, then it could do so, but the excess created in regulatory fees by the cutback, would then automatically revert to the regulated companies for passing back to the consumers. That way the Government could impose controls on overall spending, but would have no incentive and no ability to divert funds intended for regulatory use. This type of revolving fund mechanism is common in regulatory agencies in the United States and elsewhere.**
- 8. The practice of having a performance contract for regulators should be discontinued.**
- 9. The law should be amended, or policies put in place, to provide for periodic, public, transparent review of the activities of ANEEL by designated legislative and/or executive authorities on a regular, periodic basis (perhaps every 4 or 5 years).**
- 10. ANEEL's rules, or preferably, the law, should be amended to require that all communications between ANEEL and any party, specifically including any**

agency of the Government, on a matter currently, or about to be, pending before the agency, be made in a publicly accessible, completely transparent way.

11. All decisions of the agency be in writing and should explicitly follow the format below:

a. General Description and History of the Matter(s) Under Consideration;

b. Summary of the Views Offered by All Parties to the Matter;

c. ANEEL's Analysis of Law Facts, Evidence, and Opinions Offered;

d. Formal Statement of the Decision and its Rationale.

12. All decisions should be taken by vote of the Directors in a public meeting with each Director having the opportunity to speak about his (her) decision, and with each Director having the opportunity to submit a separate written opinion either concurring with the majority of Directors, but for different reasons than those set forth in the majority decision, or dissenting.

13. ANEEL should seek formal input from all interested parties into how it might make better use of public hearings for testing information and ideas that have been put before it. Upon receipt and analysis of the input, the agency should adopt procedural rules that provide for a more rigorous, open opportunity to test information given to ANEEL for consideration in any given matter.

14. A conference should be convened including CNPE, legislative leadership, and the regulators, with stakeholder input, to propose basic legislation clarifying and fully defining the respective authorities of CNPE and ANEEL. The legislation can set the desired boundaries, but it should also include the following principles:

- a. **Executive policy determinations are binding only where the executive agency acts within its defined authority and where its actions or articulation of policy precede any decision of ANEEL on the same subject;**
 - b. **Only a duly constituted Court can determine if ANEEL has exceeded its authority under the law, and reverse the decision for having done so;**
 - c. **ANEEL be given the authority to seek guidance from CNPE where it believes such guidance is necessary for jurisdictional reasons, provided that ANEEL seek and obtain, and that CNPE provide the guidance in a fully transparent and open way;**
 - d. **ANEEL be provided with the discretion to decide matters where the articulation of policy is not complete or comprehensive, but where a determination is necessary for the fulfillment of the agency's responsibilities, is relevant to a pending matter, and where the action constitutes a reasonable exercise of ANEEL's lawful authority.**
- 15. ANEEL should open a formal proceeding in which comments are solicited through both written submissions and public hearings to determine the optimal level of centralization and decentralization of the regulation of the distribution sector. Among the questions to be posed should be the following:**
- a. **Does delegation have to be identical for all states?**
 - b. **Is there an asymmetry between possession of service quality information and authority to use it?**
 - c. **If ANEEL should delegate more authority to the states, what appellate and/or supervisory authority should it retain? What criteria, if any, should**

- ANEEL set for the exercise of regulatory authority by the states? Who should oversee quality assurance in regulation?**
- d. Will more delegation lighten the work burden borne by ANEEL or will it simply complicate matters?**
 - e. What assurances are there that state regulatory agencies will function independently?**
 - f. What will be the effect of state regulation of the energy buying practices of distribution companies?**
- 16. The responsibility for conducting auctions and for granting concessions should ultimately be assigned to another designated entity (either private or governmental), with experience in conducting auctions or other competitive solicitation. All concession related documents and the methodology used in conducting competitive solicitations should be pre-approved by ANEEL**
- 17. ANEEL, after extensive, transparent proceedings, should promulgate performance standards for both MAE and ONS. In regard to incentives, ANEEL should, in the course of the same proceedings, seek out opinions as to what types of incentives are best suited for not for profit entities such as MAE and ONS, and should specifically inquire as to whether incentives for managers at those institutions would yield the same results as incentives for the institution as a whole. Once the standards are in place, ANEEL should conduct oversight proceedings for both MAE and ONS on a regular, perhaps annual, basis in which input is sought from all market participants in regard to the performance of each institution, and as to the continuing applicability of the performance standards and incentives At the conclusion of each proceeding, ANEEL should issue a**

report indicating its evaluation of the performance of the two organizations. ANEEL's report should also indicate what revisions, if any, are appropriate for the performance standards and incentives.

- 18. ANEEL should propose and seek public input on the creation of an Independent Market Monitor in Brazil. The proposal should include a proposed structure, finances, and mode of operation for the entity.**
- 19. ANEEL should establish an expedited dispute resolution process to be put in place in order to expeditiously resolve any complaints brought before it regarding actions of MAE or ONS. It should also establish a procedure for the regulatory agency to initiate an inquiry into MAE and/or ONS on its own.**
- 20. All appeals from regulatory agency decisions be directed to a single forum, the decision of which would, in the absence of any constitutional issues, be final.**
- 21. That forum should either be a specialized court formed for the sole purpose of hearing appeals from regulatory agencies, or, in the alternative, should be the Superior Tribunal of Justice. A panel of legal experts be assembled to consult with relevant parties, both public and private, and to conduct whatever research is necessary, to recommend the appropriate forum to be designated, and then to draft whatever documents are required to effectuate its recommendation.**
- 22. Appellate bodies reviewing regulatory decisions are required to affirm the decision of the regulatory agency unless it is specifically determined that the agency exceeded its lawful authority, or acted arbitrarily or unreasonably, acted contrary to the manifest weight of the evidence before it, or failed to follow proper legal and constitutional procedures and processes. In considering appeals, the appellate bodies are prohibited from consideration of any evidence or argument**

that the appealing parties failed to put before the regulator and are prohibited from reassessing the policy implications of any decision as long as they are not defective for the reasons noted above. In considering any application for a stay of execution of a regulatory order, pending full appeal, the appellate body must presume that the decision was correct. Such presumption, for purposes of temporary relief from a regulatory decision, may be rebutted, but only upon a clear showing that implementation of the decision will cause irreparable injury to the appellant, and that the appellant has a substantial likelihood of success on the overall appeal

- 23. If the appellate body finds that a decision of the regulatory agency should be reversed and that additional corrective measures need to be taken, the preferred method for undertaking further action is to remand the matter to the regulatory agency with instructions to take such actions as are necessary and consistent with the decision of the appellate body. The appellate body may also set a deadline for re-assuming responsibility for fashioning a remedy if the regulator fails to act.**
- 24. No person or party may appeal a decision of the regulator unless that person has been a participant in the proceeding in which the decision being appealed was made. No issue may be raised on appeal that was not presented to the regulator first.**
- 25. ANEEL should undertake the leadership, in coordination with other governmental and non-governmental entities to find ways of permanently funding continued advocacy for the interests of small customers before ANEEL.**

- 26. A task force consisting of representatives of ANEEL, ANP, and ANA, plus relevant Ministries and legislators be convened to study and issue a report proposing ways to achieve closer, more formal, coordination between the three agencies. Part of that study should include examination of all relevant options for closer coordination between the regulatory agencies (e.g. joint proceedings/activities, consolidation of functions, or common rules). Particular attention should be paid to coordinating regulatory policies in the evolution of generation and fuel markets. It would be useful to engage the services of consultants to facilitate the effort.**
- 27. A task force, consisting of regulators, regulated market participants, academics, and government officials be convened to propose a program for the creation and sustenance of a national program to provide the intellectual infrastructure for economic regulation in Brazil. The proposal should also include proposing a method for funding such programs, and coordination with related international activities.**
- 28. ANEEL should play only two roles in the planning process. One is to determine, upon request only, whether certain costs or risks should be socialized by passing them through to consumers. The other is to adjudicate planning disputes.**
- 29. ANEEL should open a public inquiry into the continued use of price caps in the regulation of the distribution companies. The inquiry should focus on the pros and cons of the existing system and on the potential benefits or pitfalls of replacing price caps with a cost of service or revenue cap system.**

ANALYSIS AND RESTATEMENT OF RECOMMENDATIONS

A. Human Resource Issues

A useful bit of advice received for this report, given by a high official of the Government, was to begin with the basics. Nothing, of course, is more basic than the question of resources. Unfortunately, it is in that area that ANEEL, for reasons not of its own making, has had a great deal of difficulty. The human resource problems the agency is experiencing relate to low pay, impediments to recruiting and retaining staff, and lack of professional diversity at the leadership levels. There are some financial resource concerns that merit attention as well. It is useful to put these matters in at least two contexts.

The first context is that the sense of dedication, seriousness of purpose, and level of effort by ANEEL personnel at all levels is widely recognized and appreciated. *The human resource problems identified were of an institutional nature rather than some specific failing by agency personnel.*

The second context is historical. While Brazil had very little experience with what might be described as independent regulation, ANEEL did have a predecessor agency, DNAEE, whose legacy may well include many of the seeds of ANEEL's resource problems. Because DNAEE was part of the Ministry of Mines and Energy, and because it regulated state owned enterprises, it could engage in, or be subject to, practices that are inappropriate for a modern, independent regulatory agency. Two of those practices merit specific mention. The first is that DNAEE had very few permanent employees. It was almost entirely staffed by personnel of state owned companies who worked at DNAEE on temporary assignment. Thus, these temporary staff members were compensated not by the regulatory agency according to governmental salary schedules, but rather by the regulated companies at their

higher levels of compensation. The second legacy from DNAEE was the budgetary treatment of the regulatory agency as just another bureau of the government as opposed to an “independent” entity. As such, budgetary, personnel, and administrative matters were handled precisely as they were elsewhere in the government.

The laws creating ANEEL as a modern, independent regulatory agency failed to adequately take account of the differences between the new and old regulatory regimes, and between regulatory agencies and other parts of government, as they related to human and financial resources. Thus, for example, while the law did adopt provisions to make salaries competitive with comparable tasks elsewhere in the government, it failed to consider ANEEL compensation packages in comparison with those found in the regulated private sector. They did, however, recognize the obvious conflict of interest inherent in an arrangement where an independent regulatory agency is fully staffed by temporarily assigned employees of the regulated companies who continued to draw compensation from, and still were pursuing careers within, those regulated companies. That practice simply had to be abandoned, and was. Unfortunately, the personnel and resource issues that flowed out of the discontinuation of that practice were simply overlooked.

Independent regulatory agencies differ in at least three ways from most other government bureaus. The first is that responsibility and value is defined less by number of people supervised than by expertise and substantive knowledge. The second is staff continuity is of very significant value in regulation. The staff is the institutional memory that provides a level of continuity and predictability that provides all investors and market participants the measure of comfort they require. Equally important is the fact that staff continuity is essential for allowing the full development of skills and expertise through both formal training and hands on experience. The third is that regulatory bodies are responsible

for overseeing private companies whose personnel, particularly at senior levels, are compensated at levels substantially higher than similarly situated people in the public sector. Since regulatory expertise is in high demand by regulated companies, disparities in compensation between the regulators and the regulated provide perverse incentives that are best avoided. The perverse incentives are those that entice skilled regulators to move to the regulated companies. This “revolving door” can create, at a minimum, the appearance of impropriety, if not constituting an impropriety itself. Such events severely damage the credibility, if not the effectiveness, of regulation. Each of these differences merit scrutiny in the context of ANEEL

Management and recruiting rules that are generally applicable to public administration are not always appropriate for regulatory agencies. A classic example is that often the level of responsibility, and therefore, of compensation, relates to how many people are, or how much money is, being managed by a person. In regulatory agencies, staffs and budgets are generally quite small relative to resources found in other parts of the government. Real value is derived from expertise in a variety of technical, often arcane, matters. Thus, when people are being recruited, the skills and knowledge required are often focused and narrow, something very different than the qualifications demanded in other government activities. There is, therefore, a very compelling logic to allowing regulatory agencies greater latitude in both hiring and compensating staff. ANEEL appears to have attempted to follow that logic and ran into legal difficulties related to generic criteria applicable to government. *Without getting into the minutiae of the legal issues, the Government would be well advised to take whatever steps are necessary to allow ANEEL to implement recruiting and hiring practices that are best suited to enable the agency to find the best persons for carrying out the specific responsibilities with which the agency is charged.* There is precedent for such flexibility in Argentina. There, the regulatory agencies, both

national and provincial, have utilized very innovative and unique means of testing, training, and hiring staff. They included selecting candidates for positions and conducting interactive training sessions with them including subsequent evaluations of each candidate's performance. Brazil would be well advised to provide ANEEL with similar flexibility.

Many of those interviewed commented on and complained about the problems ANEEL has experienced retaining staff. The concerns most commonly expressed, not surprisingly, were that continuity and institutional memory were lacking at the staff level, and that the staff, because of inexperience, often had to learn as it carried out its duties. The inability to retain staff appears to have its roots in three sources. The first is the previously mentioned termination of DNAEE's old practice of borrowing staff from the regulated companies. The end of that practice obviously necessitated the exodus of all such employees. The second problem is that the pay scales in regulated companies, especially at higher levels, are significantly higher than ANEEL's, so some staff were lured away by better economic opportunities. Finally, legal troubles encountered by the agency in its hiring practices have left it in the unfortunate position of not being able to hire any new staff on a permanent basis. It can only offer three-year contracts to new hires.

While some attention has already been given to the first root of the problem, the second and third also require some perspective. Regulatory agencies have to compete for staff in the same labor market as the regulated companies and other market participants. Therefore, compensation packages for ANEEL personnel need to be made reasonably competitive with those found in the regulated private sector. To the extent that regulatory agencies cannot compete in terms of the compensation it can offer to recruits, the quality of regulation will suffer. Secondly, skilled, experienced staff will find better opportunities elsewhere and will leave the agency. Neither circumstance augers well for the quality of regulation. Similarly, as

mentioned earlier, the incentive to learn regulatory skills at a regulatory agency and then market them elsewhere is quite problematic from two points of view. The first is the waste inherent in the agency investing in training and equipping a staff member to do his/her job, only to lose that person to a private company. The second is the ethical issue inherent in people moving back and forth between regulatory agencies and regulated companies. Such movements create the appearance, if not the reality, of conflicts of interest. Such situations can, and have in innumerable examples around the world, done considerable harm to the credibility and effectiveness of independent regulation. There are two elements of the equation, the first being competitive compensation packages for regulatory personnel, and the second, reasonable ethical standards. Many jurisdictions have enacted laws or rules limiting the ability of regulators to work for regulated companies after leaving regulation. While such rules make perfect sense from the point of view of ethics and public policy, they are somewhat unfair to the staff and directors of regulatory agencies, in that the skills they have developed are largely marketable only to participants in the regulated market. Although not involving ANEEL, there has already been at least one controversy in Brazil about a regulator leaving his position to go to work for a regulated company. The obvious solution, one that provides the proper balance between fairness to staff on one hand, and sensible public policy and ethical constraints on the other, is to make certain the salaries paid to regulators are reasonably competitive with those paid in the regulated sector, while imposing reasonable and measured ethical requirements which strike the balance between assuring ethics and credibility on one hand, while not imposing undue restrictions on regulatory personnel. Those ethical restrictions should be applicable not only to the Directors, but to the superintendents and other senior personnel as well. Many jurisdictions in developing countries have been able to accomplish this by indexing the compensation of regulators to

the levels found in such other independent agencies of government as the central bank, or by creating benchmarks to salaries paid by regulated companies, or by some other means of elevating the salaries paid to regulators to levels higher than those found in other parts of the government. Indeed, at least one state in Brazil, Rio Grande do Sul, has been able to do that for people who work for AGERGS, that state's infrastructure regulatory agency. The other half of the equation, as noted, is often dealt with through prohibitions on subsequent employment as recommended below.

The third root of the problem is in the laws and judicial interpretation of laws governing employment in the public sector. ANEEL's hiring practices were challenged in court on the theory that people being hired were being allowed to bypass the examinations that are generally required of government employees. ANEEL lost the case and is now effectively barred from hiring new personnel on any basis other than as contractors for a period not to exceed three years. On its face, such a restriction is devastating in effect and constitutes a major impediment to ANEEL being able to conduct business. Clearly a solution must be found.

It is an understatement to say that the situation is very unsatisfactory. *ANEEL cannot reasonably be expected to perform at anything approaching optimal levels under such constraints.* Indeed, agency personnel should be commended for performing as well as they have under such difficult circumstances. Accordingly, the following recommendations should be considered:

- 1. ANEEL should be provided with authority under the law to establish its own hiring practices, or at least, allowed the flexibility to deviate from generally applicable practices, where the skills and expertise required are unique.**

- 2. ANEEL should be enabled to establish compensation packages for employees which are either benchmarked to the levels of compensation paid by regulated companies, or, at least to allow ANEEL salaries to be comparable to other government agencies whose compensation is in excess of generally applicable government pay scales (e.g. Banco Central).**
- 3. ANEEL must be permitted to hire staff on a permanent basis.**
- 4. Directors and Staff of ANEEL should, for a period of one calendar year from the date of leaving ANEEL, be legally prohibited from employment of any kind, including on a consulting basis, which relates in any way to matters pending at ANEEL. In regard to those specific matters on which a person worked while at ANEEL, the prohibition should be of lifetime duration.**

One other item in regard to personnel relates to the composition of the Directors. While the appointing authority has fairly broad latitude in terms of the qualifications of appointees, it is striking that virtually all of the board appointments have been from the engineering profession. There is some logic to why that happened, given that the Brazilian power sector has historically been engineer driven. An excellent talent pool existed from which directors could be drawn. There is nothing unique about Brazil in regard to those circumstances. The better practice that has evolved internationally, however, is to diversify the professional composition of regulatory boards. In fact, the expertise to be applied is truly multidisciplinary. Economics, law, and accounting, in addition to engineering and other disciplines all play critical roles in regulation. *Given that it is a common human tendency to look at matters through the prism of one's own experience, it would be useful if each of those disciplines were represented on the Board itself.* While the President or Minister is certainly free to appoint people of diverse

backgrounds to the Board, it might be prudent to write a professional diversity requirement into the law itself. Accordingly it is recommended that:

- 5. Relevant legal instruments be amended to list the professions from which Directors must be drawn. At a minimum those professions should include economics, law, engineering, and accounting. No more than two Directors can be drawn from the same profession.**

B. Financial Resource Issues

The funding of regulatory agencies is central to the balance between independence and accountability. On the one hand, it is critically important that regulators have the financial means to carry out their activities on a consistent basis. That objective would seem to carry with it the ability to avoid government impoundment of funds intended for the regulatory agency. On the other hand, regulatory agencies, like any other organ of the government, need to be held accountable for their use of public funds. It ought, therefore, to be subject to all of the same budgetary and accounting requirements applicable to the rest of the government. *The problem is that the ability of the Government to take resources away from the regulatory agency in the middle of budget cycles can constitute an effective means of subverting regulatory independence. Additionally, mid-cycle budget uncertainty adds a level of unpredictability to the performance of regulatory activities, something that can do significant harm to both investor and consumer interests.* For those reasons, an effective balance needs to be drawn between the desired goals of accountability, independence, predictability, and dependability.

There has been no suggestion that the Government has meddled with ANEEL's financial resources in an effort to influence, penalize, or reward the agency in regard to

decisions it may have taken, or will soon have to take. However, there has been discussion within the Government about the possibility of impounding some of the funds intended for regulation and diverting them to other uses. The motivation of the discussants likely had little to do with ANEEL's decisions, but was rather motivated by a desire to shift resources to some other governmental use. The effect of such actions on ANEEL, however, would be to disrupt the ability of the agency to conduct its business.

Under the law ANEEL receives 0.5% of all revenues collected in its jurisdictional market. That percentage, by international standards, is not at all unreasonable. The concept that the agency should be funded by "regulatory fees" is also consistent with international practice. A problem arises for ANEEL, as it does for many regulatory agencies in other countries, when regulatory fees are diverted, as if they were like other taxes intended for general government use. *The fees are paid by consumers for very specific regulatory services, and not as a type of general taxation. To divert those funds to uses other than that to which the law directs them is neither fair nor appropriate and severely limits independence.* That being said there is no reason for regulatory agencies to not be held to the same budgetary and auditing constraints as other agencies of the government. The fact that ANEEL's fees are specifically set out in the law may provide an almost irresistible temptation to fiscal authorities to divert some of those funds when the government is financially constrained. It seems appropriate to look at alternatives to the current situation.

The key is to find a compromise between ANEEL's need for budgetary certainty and the Government's need to oversee both overall spending and exercise appropriate controls. It is also important to put the matter in context. ANEEL's total budget is insignificant in the context of the overall budget of the state. Diverting some portion of that can serve only the most limited of purposes. Although there is no evidence that the Government has diverted

funds as a way of punishing or influencing ANEEL, there is no protection against some future Government from doing so. Thus legislators should simply eliminate the possibility by legally prohibiting diversion of regulatory fees. That being said, however, the Government does have a legitimate interest in controlling overall spending and in making sure that funds are spent in ways that are consistent with proper controls.

Two measures are worthy of consideration in order to balance the competing legitimate interests. Accordingly, the following recommendations are offered:

- 6. The law should be amended to state that ANEEL, while continuing to be authorized to collect 0.5% of the electricity revenues, would have to undergo precisely the same budget approval process to which other parts of the government are subject. If ANEEL's approved budget amounts to less than .05% of electricity revenues, then the difference between the expenditures and collections should be subject to the measures set forth in Recommendation 7.**
- 7. The second measure is a prohibition, written into the law, against those funds being diverted to other use by the Government. If the Government decides to make across the board cuts in spending and apply them to ANEEL, then it could do so, but the excess created in regulatory fees by the cutback, would then automatically revert to the regulated companies for passing back to the consumers. That way the Government could impose controls on overall spending, but would have no incentive and no ability to divert funds intended for regulatory use. This type of revolving fund mechanism is common in regulatory agencies in the United States and elsewhere.**

C. Performance Contract

ANEEL has a performance contract with the Ministry of Mines and Energy. Theoretically, the contract should serve as a vehicle for holding regulators accountable. While well intended, there seems to be little evidence that it has served its purpose. It has now expired and there seemed to be little sense of urgency in either ANEEL or the Ministry in either conducting a performance review under the old document or in negotiating a new arrangement. That lack of enthusiasm seemed to be shared by stakeholders, who did not see much value in the existence of such a document. Indeed, few people seemed to have much knowledge of the terms of the contract. Additionally, it is not clear what the consequences would be if ANEEL failed to live up to what is contractually expected of it. From the perspective of regulatory independence, in fact, consequences may well be inappropriate. Performance contracts for regulators play little role in any country or state. Given that the efficacy of the document in Brazil has been dubious at best, continued use seems to serve little or no purpose.

While performance contracts may be of little practical value, the goal of holding regulators accountable through performance review is certainly laudable. The question is how to conduct such reviews without compromising independence. The model for doing so in many jurisdictions, particularly in the United States, is through formal reviews by legislative committees on a periodic basis. Such reviews could also be conducted by the CNPE, or some other executive agency. It might be optimal if the review were conducted jointly by legislative and executive authorities. The purpose of the reviews would not be to compel any particular action, or to punish regulators who failed to live up to expectations, but rather to assess the function and direction of the agency, with a view towards contemplating changes in law or policy suggested by experience. The oversight activity, to be

most effective, should take place in public and be open to public participation. The public conduct of such proceedings will hopefully allow for intelligent debate on regulatory matters and will help the public to better understand the role of regulatory institutions. It will also help to maintain the balance between independence and accountability. The following recommendations are in order:

- 8. The practice of having a performance contract for regulators should be discontinued.**
- 9. The law should be amended, or policies put in place, to provide for periodic, public, transparent review of the activities of ANEEL by designated legislative and/or executive authorities on a regular, periodic basis (perhaps every 4 or 5 years).**

D. Transparency

(For contextual information on transparency see Appendix 4)

Opinions offered about transparency were remarkably uniform. *Everyone who commented on the subject believed that ANEEL, perhaps more than any other agency of government, provided access for public input, put the Internet to excellent use, and was generally transparent in stating its intentions and making known its positions.* Interestingly, that positive view of regulatory transparency tended to break down when the questions went to such matters as how, or if, ANEEL used the input its received, whether the rationale for decisions was well articulated, and whether the reasoning and deliberative process used in arriving at decisions was clear and articulated. There was also a broadly held opinion, that ANEEL received frequent, non-transparent communications from such other parts of government such as the Ministries of Finance, and

Mines and Energy. While no attempt was made to verify the truthfulness of such assertions, and some officials denied the existence of any such communication, it is significant that the opinion seemed to be widely held by stakeholders. In fact, some observers noted that ANEEL's often repeated description of its mission as one of implementing, not making, policy, implied that there were non-transparent "policy" directions being given to regulators by government ministries. As will be noted below, many also criticized ANEEL for the opposite misdeed, namely, failing to follow government directions in some circumstances. The issue is not whether the critics are right or wrong. Rather, it is what steps might be taken to assure that ANEEL is independent, and transparent in the best sense, and to assure all parties that such is the case

It is useful to briefly discuss the relationship between independence and transparency. They are inextricably interwoven. No regulatory process can be truly transparent if it is not independent. Participants in the regulatory process should have every right to expect that they are involved in the authentic decision-making process. *They are entitled to assurance that no adverse party or interest to a proceeding has better access to decision-makers than they have, that the evidence and arguments being offered to decision-makers by any party, are available to all parties, and that the regulators cannot be bypassed by parties quietly pleading their case to "higher authorities."* In short, for the regulatory process to be independent, it has to be utterly transparent. Toward that end it is recommended:

10. ANEEL's rules, or preferably, the law, should be amended to require that all communications between ANEEL and any party, specifically including any agency of the Government, on a matter currently, or about to be, pending before the agency, be made in a publicly accessible, completely transparent way.

The broad consensus that ANEEL has provided excellent access to all parties seeking to provide input provides a firm foundation for the next steps toward total transparency. The next steps, of course, refer to queries posed by interviewees regarding how ANEEL considers the comments it receives, the nature of the deliberations, and how it articulates the rationale underlying its decisions. There are three critical purposes for adding to the agency's transparency in making decisions.

First is the obvious fact that it provides all participants with insight into how the agency considered the input it received. Some regulatory agencies use a format for their decisions that explicitly restates or summarizes the arguments that various parties have made in a proceeding. That practice has three beneficial effects. It allows participants to know that their views were not ignored and that their involvement is meaningful. Obviously, that makes the entire process more credible. Perhaps more importantly, it provides participants an insight into the thinking and analysis of decision makers that allows them to more effectively participate in future matters. Finally, it compels the regulators to think about the input received. Both the process and the regulators themselves benefit from more effective public participation.

The second purpose is that it adds immeasurably to the credibility and sustainability of the regulatory process itself. The full revelation of the technical and substantive expertise brought to bear in making a decision is of immeasurable value in defending against political interference in regulatory matters. One of the reasons for the creation of professional regulatory agencies is to allow for bringing technical expertise to bear in making decisions. Demonstrating that capability can serve, and often has, as a deterrent to those who may want to interfere, but lack the technical sophistication to do so in a fully transparent process.

Finally, full transparency provides all parties with a level of confidence that the process is honest, substantive, and credible. While not all parties will be happy with a decision, it is paramount that they feel the process was fair and that they were given many opportunities to be heard.

How can full transparency be achieved? Based on the virtual unanimity of the people interviewed, ANEEL has made an excellent start in that direction. It need only add to the steps it has already taken. The additional measures taken should be designed to make manifest how input was considered, the nature of the reasoning process, and the full range of opinions considered within the agency. Toward that end, the following recommendations are made:

11. All decisions of the agency be in writing and should explicitly follow the format below:

- a. General Description and History of the Matter(s) Under Consideration;**
- b. Summary of the Views Offered by All Parties to the Matter;**
- c. ANEEL's Analysis of Law, Facts, Evidence, and Opinions Offered;**
- d. Formal Statement of the Decision and its Rationale.**

12. All decisions should be taken by vote of the Directors in a public meeting with each Director having the opportunity to speak about his (her) decision, and with each Director having the opportunity to submit a separate written opinion either concurring with the majority of Directors, but for different reasons than those set forth in the majority decision, or dissenting.

In discussing the idea of dissenting and concurring opinions, many of those interviewed suggested that while the idea had merit, it ran against a cultural tendency in Brazil to avoid confrontation and to operate by

consensus. While that observation may well be accurate, there are reasons why it should not be used as a counter to the need for transparency. The first is that the decision making process needs to follow procedures that are credible to both Brazilians and to investors, who in many instances are foreign. While Brazilian norms ought to be the critical ones, a process that alienates foreign investors will certainly have the effect of discouraging investment from outside the country. Some balance, therefore, is required. Secondly, the so-called consensus model is not uniformly practiced in Brazil. Obviously, most legislative bodies in Brazil make decisions that have public opposition by members of the bodies. Similarly, multi-judge Courts do not always operate by consensus. Dissents are often expressed by a minority of the judges deciding a matter. ANEEL, being both quasi-legislative and quasi-judicial can follow the same model. Collegiality and respect for the institution should not be confused with a need for consensus and unanimity. If one or more Directors disagree with the majority, providing many opportunities to air such views only adds to the credibility of the agency and its processes. Moreover, diversity of opinion among Directors, when stated respectfully and clearly, helps to focus the discussion within the agency, and promotes a rigorous and focused debate among stakeholders as well. The entire process is enriched. *It seems more credible to Brazilians and non-Brazilian alike to acknowledge the obvious, namely that all five directors will not always agree and to allow for the statement of honest disagreement.* Acknowledgement of a diversity of opinion seems far more likely to enhance credibility and to enrich the process than does surface consensus.

Judging from some of the interviews, it might also be useful to make the process of establishing the facts and analyzing the issues both more transparent and rigorous. “Information” offered to regulators often requires some degree of testing before it can be relied upon for decision-making. The model for doing so in United States regulatory

agencies has been a judicial one. All parties submitting information must do so under penalty of perjury and submit themselves to cross-examination by adverse parties. That process has been criticized, perhaps justifiably, for being ritualistic, expensive, and time-consuming. Nonetheless, the complete absence of formal and open testing of information seems inadequate for a disciplined process of decision-making. In England, for example, the absence of such a process was contributory to the regulator being left unaware of the true costs of the distributors. That lack of information had some unfortunate consequences. There are a number of alternatives to the opposite poles of the U.S. and English models. They might include opportunity for cross-examination on a complete or partial basis, and public hearings with sufficient time allowed for meaningful debate/dialogue between parties and/or experts, formal questioning in public hearings by Directors or staff of parties and their experts. In fact, some interviewees specifically offered the view that ANEEL should make much better use of public hearings by allowing more time for substantive presentation and debate. Rather than prescribing any specific mechanism to use, the following recommendation is made:

13. ANEEL should seek formal input from all interested parties into how it might make better use of public hearings for testing information and ideas that have been put before it. Upon receipt and analysis of the input, the agency should adopt procedural rules that provide for a more rigorous, open opportunity to test information given to ANEEL for consideration in any given matter

E. Clarifying And Delineating Roles and Responsibilities

There appears to be considerable confusion sorting out the respective responsibilities of the Ministry of Mines and Energy (MME), ANEEL, The National Energy Policy Council (CNPE), and other agencies. As noted earlier, ANEEL describes its mission as the implementer not the maker of policy. In interviews, it became clear that there was no common understanding as to what that meant. Indeed, in terms of international regulatory experience, that distinction has little meaning. *There are very few decisions that regulators make which lack policy components or implications. For better or worse, regulators do make policy.* Thus the issue is better defined as setting the parameters within which they may set policy. It could be argued that the proper boundary line is between energy policy and regulatory policy, with the latter falling to ANEEL to decide. The fact is that legislative authorities, and perhaps CNPE in designated circumstances, should and can articulate the basic policies in regard to both energy and regulation. Unfortunately, that has not occurred and confusion governs the question of who bears what responsibilities. The recent controversy over the valuation of the assets of the distribution companies is an excellent case study of the issue.

Although it is beyond the scope of this report to delve into the substance of the asset valuation controversy, the institutional aspects of the dispute are very instructive. When the distribution companies were privatized and the initial concessions were granted, nothing was reduced to writing to explain the methodology to be used in valuing the assets of the companies when rates and tariffs were to be reviewed. In contrast, the primary or secondary laws in Argentina, Bolivia, Chile, and Peru provided a fairly high degree of specificity that the regulatory asset base would be calculated using a replacement cost methodology based on the concept of a “model efficient company” in future tariff proceedings. Similarly, in the U.S., many state regulatory statutes expressly designate the methodology to be used, in most

cases, original cost less depreciation. Unfortunately, in Brazil, neither statute nor secondary law articulated the methodology. The distribution companies believed that there was an understanding that the methodology to be used was to be the same as those used to determine the minimum or bid prices for the concession at the time of sale. No such understanding, however, can be found in any legal document binding subsequent regulators. Indeed, at the time that several of the concessions were granted, the regulatory system did not yet exist. As the time for the new, multi-year rate and tariff review drew near; some of the distributors believe that they extracted a commitment from CNPE to pronounce on the methodology to be employed before ANEEL acted. ANEEL, however, not knowing of any such arrangement and feeling obligated to begin timely review of the rates and tariffs, commenced a proceeding on asset valuation. It solicited and received proposals and ideas and then issued a decision utilizing an asset-by-asset replacement cost methodology. The distributors, unhappy with the result, then appealed to the Ministries with seats on CNPE to declare the asset valuation question to be a policy matter which they, not ANEEL, were empowered to decide.

The institutional aspects of the controversy reveal a number of issues. The first and most obvious problem was the fundamental error of privatizing before implementing regulation, or, at least, specifying in more detail the tariff setting system that subsequent regulators would be required to implement at the end of the first tariff setting period. Issues such as the methodology of asset valuation would likely have been addressed had sufficient thought been given to the regulatory regime before the concessions were granted. That error in sequencing has left a legacy of uncertainty as to the scope of the regulator's authority and has unnecessarily complicated the lines between energy policy and regulation.

A second matter of significance revealed by the asset valuation controversy is the continuing lack of clarity regarding sequencing. For example, if asset methodology is a matter of energy policy rather than a regulatory matter, then logic would dictate that it would be decided before the regulators took a decision. ANEEL certainly gave adequate notice of its intent to take up the issue when, in 2000, it conducted Public Hearing 7/2000 to receive input from all parties on that very topic. It was only after the regulator took action, however, that the “policy-makers” at CNPE took up consideration of the issue. To the outsider, it would appear that the CNPE is acting as an appellate court rather than as policy-maker. Several of those interviewed took issue with that perspective and contended that CNPE has authority to decide such matters, but had simply failed to act before ANEEL took up the issue. They contend CNPE had every right to review the issue even though ANEEL had already done so. If the latter argument is correct, then there is still a counter-intuitive sequencing process under way. *How can ANEEL be subservient to government policies that remain unarticulated?*

A third issue is that there is no clarity as to the boundary between regulatory policy and energy policy. Asset valuation could arguably fall into either category, but it seems apparent that no one is certain as to public policy on the question. It is to be expected that all policy issues cannot be anticipated in advance, and that uncertainties will occur. Certainly, that was the case when ANEEL conducted Public Hearing 7/2000. Likewise, issues will constantly arise which raise policy questions, but perhaps on a scale that policy makers fail to take notice of. Who then is to decide such matters?

The issue of the relationship between policy making and regulation is rendered more complicated in Brazil by the existence of an Executive Branch policy-maker, CNPE, supplementing the role of legislative policy-makers. It creates a more real time, more micro

oriented dynamic to policy-making than if the Congress were the sole policy maker. That complexity is enhanced by the fact that CNPE is still a new institution trying to fully define its role. Most countries with independent regulatory bodies do not have such a body, although in most Indian states, this policy making authority is reserved for the government acting through the state Ministry of Power. Basic policy is set forth in statute, and micro policy issues are sorted out by either the regulator, or the Ministry, depending upon how the legislators decide to allocate responsibility. Moreover, the allocation of responsibility is usually made based on agency missions, not based on a sense of hierarchy of decision-making. Hence, if the responsibility for a matter is assigned to the Ministry it is generally because it is consistent with the ministry's duties, not because legislators want a ministry dictating policy to regulators. That issue is so sensitive that in some countries such as Argentina, legislators have contended that regulators are part of the legislative branch of government, not of the executive branch. Finally, if policy can be established after ANEEL has decided a matter, and the effect of the policy decision is to reverse the regulators' decision, has regulatory transparency and independence been seriously compromised? What predictability or stability can be expected of a regulatory regime that allows for *ex post facto* decisions on policy matters?

Clarity must be brought to the entire question of jurisdictional boundaries and the notion of policy-making versus implementation of policy be replaced by a clear definition of jurisdictional boundaries. Rather than making specific recommendations on what the boundaries should be, the following recommendation is offered:

14. A conference should be convened including CNPE, legislative leadership, and the regulators, with stakeholder input, to propose basic legislation clarifying and

fully defining the respective authorities of CNPE and ANEEL. The legislation can set the desired boundaries, but it should also include the following principles:

- a. Executive policy determinations are binding only where the executive agency acts within its defined authority and where its actions/articulation of policy precede any decision of ANEEL on the same subject;**
- b. Only a duly constituted Court can determine if ANEEL has exceeded its authority under the law, and reverse the decision for having done so;**
- c. ANEEL be given the authority to seek guidance from CNPE where it believes such guidance is necessary for jurisdictional reasons, provided that ANEEL seek and obtain, and that CNPE provide the guidance in a fully transparent and open way;**
- d. ANEEL be provided with the discretion to decide matters where the articulation of policy is not complete or comprehensive, but where a determination is necessary for the fulfillment of the agency's responsibilities, is relevant to a pending matter, and where the action constitutes a reasonable exercise of ANEEL's lawful authority.**

F. Delegation of Authority to State Regulators

The Brazilian Constitution specifically vests responsibility for the power sector with the national government. That delegation of power, however, does not preclude the delegation of some of that authority to state governments. Indeed, the law creating ANEEL specifically enables the delegation of regulatory powers to the states. ANEEL has signed contracts with 13 states to do just that in the areas of handling consumer complaints and auditing. The question is whether those arrangements are sufficient, or whether more authority should be

delegated to the states. In evaluating the issue, it is appropriate to consider the five contexts in which further delegation is considered.

The first context is simply that the only part of the industry where substantial delegation to the states is feasible is the distribution sector. Certainly, the limited powers ANEEL has delegated relate exclusively to distribution companies. No one suggested any such delegation of economic regulatory powers in regard to either transmission or distribution, although it should be pointed out that much of the environmental regulation of generation and transmission is jurisdictional to the states. In that same context is the question of whether state regulation of distribution companies, the biggest purchasers of energy in the wholesale market, would allow greater diversity in how energy purchasing decisions are made, thereby enhancing and enriching the marketplace. In theory, if the states rather than ANEEL were overseeing the prudence of the energy purchasing activities of the distribution companies, the standards employed are likely to be less uniform. The lack of uniformity will allow for greater opportunities in the marketplace. While it is arguable whether the theory will hold up in practice, the question does deserve attention.

The second context relates to the states themselves. Not all of the states have established independent regulatory agencies. There appears to be a wide disparity in the perception of the quality of administration and professional capabilities of the various state governments. Although the authors of this report were impressed by the seriousness and depth of knowledge demonstrated by state regulators interviewed for this report, some of the people interviewed were of the opinions that some states were never likely to be in position to effectively regulate within their state. A number of interviewees, although certainly not all, were of the opinion that the state regulatory agencies were too politicized to exercise independent judgment. Some of them (although fewer, it should be noted) thought that

about ANEEL as well. It was also pointed out that the power market structure varied from state to state. In some states, the industry remains vertically integrated, while in others distribution has already been unbundled. Not all states had completely privatized their electric utilities, and a few had not privatized at all. In short, the states appear to be quite diverse in terms of capabilities and evolution of the industry.

The third context is ANEEL's workload. As noted, the agency is laboring under a variety of institutional constraints that are, to understate the point, challenging. Despite the problems, ANEEL is being asked to undertake a Herculean burden, namely regulating all aspects of the industry, conducting auctions, granting concessions, overseeing the development of the market, monitoring ONS and MAE, making rules for quality of service and a variety of other activities, carrying out liaison with other branches of the government, and many other tasks. It is not clear whether carrying out such a vast array of responsibilities, particularly in the contexts of all of the problems encountered to date, is feasible. In many other federal systems of governance around the world, India, Canada, U.S., Australia, Argentina, and Russia, for example, power sector regulation is, to varying degrees, decentralized. In that context, delegating more responsibility to the states may be a meritorious idea.

The fourth context relates to the private investment that has been made. Much, although not all, of the privatization of the power sector, was carried out by the national government. Some argue, therefore, that the regulatory treatment accorded those entities should be the responsibility of the national government as well. That argument is somewhat ironic in light of the dispute over asset valuation, but cannot be disregarded. There has been some concern in Brazil since the beginning of privatization, that too much devolution of regulatory responsibility to the states would cause confusion for foreign investors and therefore

discourage the flow of capital into the sector. Thus, there is a question related to whether there is an implied assurance to investors that most regulatory responsibilities will remain in Brasilia.

The fifth and final context flows out of the delegation of responsibility that has already been passed to the states, namely the handling of complaints and auditing. The question is whether an asymmetry has been created between possession of information and actual responsibility. Because of their responsibilities for monitoring service quality and auditing, those states with whom ANEEL has contracted may well be in possession of much greater information regarding service quality and costs than does ANEEL itself. Nonetheless, ANEEL has retained the authority to set tariffs and to promulgate the rules regarding quality of service and the interface between distribution companies and their customers. While the states are obligated under their contracts to provide ANEEL with periodic regular reports of data in their possession, the familiarity with the information is likely greater at the state than at the national level. Thus it is useful to ask whether it makes sense to build the database necessary for both service quality and ratemaking at the state level, while confining the use of that information to national regulators.

The opinions expressed by those who were interviewed ranged widely on the question of delegating more responsibility to the states. Comments ranged from “forget about it,” to “seems like a good idea.” Not only were the comments widely varied and contradictory, they cut across interest group lines. Private utility companies and consumer groups alike had very diverse opinions among themselves. Some interviewees who were generally opposed to giving more authority to the states indicated that their opinions might change if ANEEL were to retain supervisory oversight and/or appellate functions over decisions made by state

regulatory agencies. Given that there was no consensus, it makes sense to recommend the following:

15. ANEEL should open a formal proceeding in which comments are solicited through both written submissions and public hearings to determine the optimal level of centralization and decentralization of the regulation of the distribution sector. Among the questions to be posed should be the following:

- a. Does delegation have to be identical for all states?**
- b. Is there an asymmetry between possession of service quality information and authority to use it?**
- c. If ANEEL should delegate more authority to the states, what appellate and/or supervisory authority should it retain? What criteria, if any, should ANEEL set for the exercise of regulatory authority by the states? Who should oversee quality assurance in regulation?**
- d. Will more delegation lighten the work burden borne by ANEEL or will it simply complicate matters?**
- e. What assurances are there that state regulatory agencies will function independently?**
- f. What will be the effect of state regulation of the energy buying practices of distribution companies?**

G. ANEEL Role in Auctions and Concessions

In addition to all of its regulatory obligations, ANEEL is required to conduct auctions and grant concessions for new energy supplies and for new privatizations. While it is not

unheard of for regulatory agencies to fulfill such responsibilities, the only explanation that was offered in the interviews as to why these tasks were assigned to ANEEL in the first place was that they were new functions and since ANEEL was the new agency, it seemed practical to do so. Other countries, such as Peru, have decided that granting concessions and conducting auctions are simply not a regulatory function. In light of experience and given that there is now more time for contemplation, it is useful to reevaluate whether these functions should remain responsibilities of a regulatory agency.

The first question to ask is what is the regulatory interest in the auctions and concessions. To be sure, there is a regulatory interest. The terms and conditions under which regulated companies must operate are certainly significant matters. The regulatory interest goes almost entirely to the substance of the concessions and licenses that are granted, and to the fairness/transparency of the auction itself, but not to the actual identity of the successful bidder(s), other than perhaps to some general qualification criteria. The regulator is the one with the responsibility for assuring compatibility of the concessions with market and regulatory rules, and who has to enforce the terms and conditions of the concession documents. Thus, there is a very clear role for the regulators in setting the terms and conditions within concession documents and in making certain that auctions are conducted fairly and transparently.

In regard to the actual procedures for the auctions and granting of concessions, the regulator has both responsibilities and conflicts that must be considered. The responsibilities include making sure that successful bidders meet certain minimal qualifications (e.g. financial or technical) for being a licensed market participant, making certain that the concessions granted are compatible with both the market and regulatory rules, and to generally make certain that the interests of the power sector as a whole are protected. A common example

of the latter is the basic tension that exists in the privatization of a state owned company between the government's interest in maximizing the revenues from the sale on one hand, and the sector's interest in making sure the asset is privatized in a fashion that best enables efficient pricing, optimal operation of the market, and consumer benefit. It falls necessarily to the regulator to assure the latter interest. These interests can be protected on either a generic, or pre-action basis. Certainly setting minimal qualifications for market participants is a matter of setting generic criteria that bidders either meet or fail to meet. Company specific approvals are both unnecessary and subject to allegations of discrimination and favoritism. Thus ANEEL, if it chooses to do so, may set minimal criteria for eligibility for participation in an auction or being granted a concession. Similarly ANEEL can approve all of the concession documents and/or authorize the methods for conducting auctions on either a generic basis, or, at a minimum, before any players or potential players are identified.

Avoiding allegations of favoritism or discrimination is not the only reason for ANEEL to avoid involvement in actual selection of market participants. The agency has at least three inherent conflicts of interest in determining who will be awarded licenses. The first is that the regulator will inevitably have to make judgments about a market participant's performance. A regulatory agency will have far more credibility and greater appearance of objectivity if it has played no role in selecting market participants than if it is making judgments about a company it specifically chose to be a market participant. The second conflict is that it is the ultimate judge as to whether auctions are conducted fairly or to whether concessions are properly granted. Obviously, if it is ANEEL itself who is carrying out those responsibilities it cannot then sit in judgment on how it conducted itself. The third conflict is the one mentioned earlier. The Government may have multiple purposes in granting licenses. Maximizing revenues and making the sector more efficient, as noted, are

two such purposes. ANEEL has an inherent interest in looking out for the sector and cannot be expected to weigh all of the governmental interests. While it can and should articulate certain principles to be followed, it cannot be expected to balance all of the interests of the state. Finally, the actual conduct of auctions and granting of concessions is very labor intensive. As noted earlier, ANEEL has an extraordinary breadth of responsibility, and it need not be compelled to perform what should be an administrative function. That activity can just as easily be performed elsewhere in the Government or by private sector actors. In fact, ANEEL has, itself, recognized this possibility by contracting out the auction activities as they related to transmission additions. It is, therefore, recommended:

16. The responsibility for conducting auctions and for granting concessions should ultimately be assigned to either the Ministry of Mines and Energy or another designated entity (either private or governmental), with experience in conducting auctions or other competitive solicitation. All concession related documents and the methodology used in conducting competitive solicitations should be pre-approved by ANEEL

H. Regulatory Oversight of MAE and ONS

ONS and MAE, as the system and wholesale market operators respectively, are institutions central to the functioning the power sector. It is essential that they be subject to close regulatory oversight. Many of those interviewed were of the belief that ANEEL had, prior to the crisis, been entirely too passive in exercising its oversight. In the case of MAE, the passivity was, at least in part, motivated by the paradigm that the energy exchange was to be self-governed by a stakeholder board. Almost everyone acknowledges that the design was

a weak, and ultimately, dysfunctional one. Too many interests had too much at stake to allow for more effective compromise and resolution of disputes. Exemplary of the inability to function was the fact that the amount of funds held in escrow for distribution to market participants, perhaps the central purpose of MAE, grew into the billions of reals while the various interests have been quarreling over entitlement to the money. While there are now reports that a settlement may be near, no market can be expected to function in the face of such longstanding deadlocks over the flow of money. While one might have expected the regulator to intervene in order to break impasses, the self-governing paradigm, and perhaps other factors, operated as a constraint on ANEEL. In April 2002, in response to the crisis, the governance of MAE was altered. The Administrative Council now consists of five members elected by the "General Assembly," which is representative of the generators and traders. They, in turn select an organizational structure composed of a superintendent and seven managers, all of whom are employees of MAE for a term of two years, and who actually manage the agency. At the present time the positions President of the Administrative Council and that of superintendent are held by the same person. It is now expected, in order to avoid the mistakes and deadlocks of the past that ANEEL will engage in more rigorous oversight of MAE.

ANEEL has taken note of the impasses that had been characteristic of MAE. In response, it has created a mechanism for trying to mediate such disputes. While the effort is useful and laudable, *it is not clear that mediation alone will be sufficient*. It makes sense, therefore, to supplement it with a binding dispute resolution process that operates on an expedited basis and possesses the power to impose a resolution in the event that a party seeks such a resolution to a dispute. One possibility would be the appointment of an independent arbitrator appointed by ANEEL, although it is imperative that the arbitrator issue a formal,

fully explanatory opinion because it is essential that ANEEL be kept fully abreast of any problems in market operations. Several interviewees noted that ANEEL has to maintain intimate knowledge of marketplace developments.

The performance of the regulators in regard to ONS was also the subject of a number of comments. Many of those interviewed were of the belief that ONS was too dominated by the perspective of the state owned hydro generators and conducted their activities with undue focus on the use of the hydro plants. Although that point of view was widely shared, the ONS governing structure itself was broadly based among market participants. There are nineteen members of the Administrative Council, seven representatives of producers, seven from consumer interests, and four from transmission, all nominated by a “General Assembly” of market participants. In addition, there is a representative of the Ministry of Mines and Energy on the Board. That representative possesses veto power. Unlike MAE, the stakeholder model of governance at ONS has not been modified. The purpose of MME’s presence with a veto, of course, is to avoid deadlock, such as occurred at MAE. The Administrative Council elects the President and four Directors who actually manage the agency. Several of the members of that body were drawn from the generating sector, perhaps reinforcing the perception of bias. One question often raised was why regulatory oversight failed to mitigate the bias, or, if the bias was not proven, why ANEEL did not make a specific determination. Some, including ONS, denied the existence of such a bias and therefore, believed that ANEEL had nothing to correct. It is also interesting to ask what ANEEL could have done if it had concluded that action was required in order to mitigate bias in system operations. It should be noted that ANEEL has been engaged in regulatory oversight of ONS. It has conducted audits, monitored operations, and undertaken other such regulatory actions. Based on the observations of many of the interviewees, however,

these activities appear not have been widely known. That suggests that the regulators would be well advised to conduct their regulation of ONS on a more transparent basis, so all parties would have the opportunity to know as much as they desire about it. While it could have taken direct action and ordered mitigation through either specific measures or through requiring changes in governance, it is not at all clear that traditional regulatory measure such as setting appropriate performance incentives are useful for a not-for-profit institution such as ONS or MAE. One possible incentive that might be useful is for the regulator to assume a direct role in determining the compensation packages for senior personnel at ONS or MAE. As noted earlier, it is not the intention of this report to evaluate whose versions of events are more accurate. Indeed, the existence or non-existence of bias at ONS is not relevant to the recommendations made on this point. The fact, based on comments of interviewees, is that it would be appropriate for ANEEL to exercise its regulatory oversight of ONS on a more transparent, public basis.

Two observations are of interest at this juncture. *The first is that the stakeholder governance regime in electric market institutions in Brazil has been quite problematic* Brazil is not at all unique in that regard. In California, the system operator, under stakeholder control, became almost entirely dysfunctional, and the entire Board had to be replaced and completely restructured. The second relates to the segregation of market operations from dispatch. The Power Exchange, California's equivalent of MAE, was a complete failure, and had to be completely dismantled by the regulators. In fact, it is interesting that MAE and ONS persist as separate entities. In the U.S., largely because of the California experience, the market and dispatch operations are being combined under a single organization.

An additional area of concern implicit in the comments of those interviewed is whether ANEEL, and, for that matter, the market participants themselves, were sufficiently informed

of what was actually occurring at MAE and at ONS. There was, some interviewees noted pointedly, no effective ongoing monitoring of the market and its institutions. Such comments, however, should not necessarily be seen as criticism of the regulators. *No regulatory institution anywhere in the world can be relied upon to monitor in real time, the operations of, and practices within the market.* It is a task for which regulatory agencies are not well suited. In the U.S., for example, the Federal Energy Regulatory Commission, in recognition of this shortcoming, is requiring that each of the Regional Transmission Operators (ISO's) have within it an autonomous market monitor charged with the responsibility of closely observing the markets with an eye for ferreting out and reporting market power, abusive practices, market design flaws, or systemic problems. *In effect, the market monitor serves as the eyes and ears of the regulator.* The market monitors in the U.S. possess sufficient independence to either go public with their findings or appeal directly to the regulators for relief. Market monitors are an increasingly of interest around the world. They have been established in Europe and Panama, and are being proposed for Bolivia and Peru. There is merit in ANEEL considering the establishment of a comparable entity in Brazil.

The specific functions of the market monitor are worth enumerating. They include real time and in-depth observation of the all market participants, including the system operators, market operators, generators, transmission providers, and, perhaps distributors. The monitor's role is to identify, as early as possible, abusive practices, exercise of inordinate market power, market design problems, deficiencies in market and/or dispatch operations, collusive behavior among competitors, and violations of market rules. The fundamental role is to observe the market on a real time basis, and publishing its findings as necessary, or, perhaps, on a periodic basis. The monitor would have no powers beyond the mere identification of problems. If there are to be consequences, such as penalties or license

suspensions, only the regulator can decide. The point is that there will be early warnings for all parties of problems in the marketplace to prevent a major crisis. The monitor could be physically located at the system operator or within ANEEL, but it would be an independent entity, and the monitor himself (herself) would have to be approved by ANEEL. He could not be removed from his position without the express approval of ANEEL. Moreover, the monitor would **not** need approval of any person or agency to make public its assessments or recommendations. Its job is to get its message out, and there should be no institutional barriers to doing so.

For the reasons noted, the following recommendations are made:

17. ANEEL, after extensive, transparent proceedings, should promulgate performance standards for both MAE and ONS. In regard to incentives, ANEEL should, in the course of the same proceedings, seek out opinions as to what types of incentives are best suited for not for profit entities such as MAE and ONS, and should specifically inquire as to whether incentives for managers at those institutions would yield the same results as incentives for the institution as a whole. Once the standards are in place, ANEEL should conduct oversight proceedings for both MAE and ONS on a regular, perhaps annual, basis in which input is sought from all market participants in regard to the performance of each institution, and as to the continuing applicability of the performance standards and incentives. At the conclusion of each proceeding, ANEEL should issue a report indicating its evaluation of the performance of the two organizations. ANEEL's report should also indicate what revisions, if any, are appropriate for the performance standards and incentives.

18. ANEEL should propose and seek public input on the creation of an Independent Market Monitor in Brazil. The proposal should include a proposed structure, finances, and mode of operation for the entity.

19. ANEEL should establish an expedited dispute resolution process to be put in place in order to expeditiously resolve any complaints brought before it regarding actions of MAE or ONS. It should also establish a procedure for the regulatory agency to initiate an inquiry into MAE and/or ONS on its own.

I. Appellate Processes

Perhaps the most basic means of holding regulatory agencies accountable is the process for appealing its decisions. At present, any party feeling aggrieved by a decision of ANEEL has the right to appeal to the federal courts. The case would first be argued to a lower court, and if satisfaction were not derived, then the matter could be appealed through the various appellate levels of the judiciary. There are a number of problems with that situation. The first, as noted by a number of people interviewed, is that independent regulation is a new concept in Brazil and the judges are largely unfamiliar with such agencies and with the subject matter for which the agencies have responsibility. Indeed, the issue is not unique to ANEEL. It also applies to ANATEL, ANP, ANA, and other agencies as well. Many judges were reported by many of those interviewed, to have been open in discussing their lack of comfort with regulatory matters. Secondly, the fact that appeals could go to any federal court, creates a substantial likelihood that there will be significant inconsistencies regarding interpretations of relevant laws, the authority of the regulators, and the substantive matters with which they have to deal. That adds considerable uncertainty in an area where certainty is highly desirable. Third, the multiplicity of the levels of appeal can significantly lengthen the

time during which there is considerable uncertainty about a particular outcome. That is particularly true in Brazil, where the courts are notoriously slow in making decisions. Fourth, the criteria to be applied in the judicial review of regulatory decisions are not clear.

In a generic sense there are three basic options for appealing the decisions of independent regulatory agencies, with a variety of variations within each option. The first option, of course, is to appeal to the Government itself. The second is to appeal to a special tribunal created for the express purpose of hearing regulatory appeals. The third is to appeal to the general judiciary. The problem with the first option is essentially two fold. The first, and most obvious, is that if appeals go directly to the government, then little purpose has been served by creating “independent” regulatory agencies, since political authorities will have the final say anyway. The second problem, is that in many jurisdictions, an aggrieved person has a fundamental right to appeal to the courts, so even an appellate decision by the government itself, does not preclude judicial review. In effect, there are redundant appellate mechanisms. In fact, that would be the situation in Brazil if appeals went to the Government. Special tribunals can be created to hear regulatory appeals, or a pre-existing tribunal can be assigned the responsibility, as in the case of the Competition Commission in England. Special appellate tribunals are in use in several states in India and in Bolivia. They are being recommended for use in Chile and Tanzania. That approach is perfectly reasonable except that, unless the special tribunal is judicial, its decisions could be subject to judicial review as well. Ironically, in England, appeals go directly from the Competition Commission to the Government, and then, although it has not yet been tried, perhaps to the judiciary as well. The third option is direct appeals to the courts. This option has the benefit of fulfilling constitutional or other legal rights available to citizens. It does, however, have the weakness noted above, namely that where independent regulation is a new concept, the judiciary is

often unprepared to deal with such matters. Unless there are separate courts for dealing with administrative matters, the judiciary may, as some Brazilian judges have noted, be ill equipped to decide such matters. Finally, unless judicial review is channeled to a very specific forum, and unless there are strict criteria to be applied in considering appeals, there is a very real possibility that uniformity will not exist in either the interpretation or application of the law or dealing with substantive matters. There has, in the past, been some discussion of setting up mediation between ANEEL and a party who feels aggrieved by a decision of the agency. That approach has never gone beyond the discussion stage for two good reasons. The first is that the process would be voluntary. It is, therefore, unclear why ANEEL, or any regulator for that matter, would want to submit itself to such a process. The second reason why the idea is problematic is that ANEEL is a legally created agent of the state. It operates on a *de jure* basis, and, as a matter of law, its decisions are appealable to the judiciary. Thus a dispute between a regulatory agency and a party is of an entirely different nature than the types of disputes between individual parties with similar status which lend themselves well to mediation

The characteristics most desirable in an appellate process are the competence, both technical and legal, of the decision-makers, the independence, transparency, and fairness of the forum, the consistency of decisions, the dedication to following the law, the expeditiousness of decision-making, and the finality of decisions. In light of the options discussed above, and in light of the attributes desired, it seems clear that it would be preferable in Brazil to have a single forum for hearing all appeals from regulatory decisions, and that decisions from that forum should be final, subject only to appeal to the Supreme Constitutional Court if constitutional issues are present. The existence of a special appellate body in the judiciary would seem to satisfy the rights of Brazilians to seek redress in the

courts, and to assure that regulators are held legally accountable. There is also considerable, although not universal, precedent in the United States to limiting regulatory appeals to a single court. In most states, the decisions of regulatory agencies, in the absence of any federal constitutional issue, can only be appealed to the State Supreme Court. The decision of that court is final. The issue is, therefore, what is the appropriate forum. That decision depends in large part on the Constitution and laws of Brazil. There appear, however, to be two choices: the creation of a specialized regulatory appeals court, or direct appeal to the Superior Tribunal of Justice, the nation's highest appellate court on all matters other than constitutional ones. There are pros and cons for each. A specialized court might be tempted to interfere with policy questions rather than concentrating on legal matters. On the other hand, it is almost certain to develop the expertise required. That capability, for example, would be necessary to determine if regulators correctly applied a tariff setting methodology enunciated in statute. The Superior Tribunal of Justice is probably less likely to dwell on the policy issues rather the legal ones, but given its broader mandate, it may well be less likely to develop a similar level of expertise. Also, with its larger workload, it may well be slower in rendering decisions. Either of these choices would serve the purpose of limiting appeals to a single forum and of allowing the development and marshalling of regulatory expertise in the forum where appeals are heard. The question of which is to be chosen is best left to Brazilian legal experts who can examine which appellate mechanism is most easily attainable from a legal and constitutional perspective, and which would provide the most effective forum for appeals. Accordingly, it is recommended that:

20. All appeals from regulatory agency decisions be directed to a single forum, the decision of which would, in the absence of any constitutional issues, be final.

21. That forum should either be a specialized court formed for the sole purpose of hearing appeals from regulatory agencies, or, in the alternative, should be the Superior Tribunal of Justice. A panel of legal experts be assembled to consult with relevant parties, both public and private, and to conduct whatever research is necessary, to recommend the appropriate forum to be designated, and then to draft whatever documents are required to effectuate its recommendation.

In addition to considering the appropriate forum for hearing appeals, three other important issues need to be considered. The first is defining the criteria for deciding appeals. The second is the question of what remedies should be available to successful appellants. The third question is who is entitled to appeal an agency decision. The answer to the first question requires consideration of the principles involved. Specialized regulatory agencies are created to develop and apply technical and substantive expertise in the regulated sector. Their mission is to carry out their obligations in a manner calculated to meet both social and economic objectives in the sector for which they bear responsibility. To do so requires consistent articulation and application of consistent policies, incentives, enforcement measures, and processes. To carry out its objectives, and to adjust to changing circumstances, the agency needs to be given a fair degree of flexibility and latitude. Parties seeking to influence regulatory agencies should be obligated to present all of evidence they want considered to the regulators for their evaluation. It would be impossible to expect consistency or any degree of predictability if parties were free to withhold evidence from regulators but then present it to appellate bodies. Regulators, on the other hand, should not be in a position to exceed their lawful authority, act arbitrarily or unreasonably, or deny stakeholders or other citizens a fair opportunity to be heard on matters affecting them. It is

to strike that balance between sufficient flexibility to carry out responsibility while maintaining accountability that the right to be appeal is designed. To be effective in striking that balance, appellate bodies must be limited in what they may consider on appeal and in what criteria they can use to review regulatory decisions. It is, therefore, recommended:

22. Appellate bodies reviewing regulatory decisions are required to affirm the decision of the regulatory agency unless it is specifically determined that the agency exceeded its lawful authority, or acted arbitrarily or unreasonably, acted contrary to the manifest weight of the evidence before it, or failed to follow proper legal and constitutional procedures and processes. In considering appeals, the appellate bodies are prohibited from consideration of any evidence or argument that the appealing parties failed to put before the regulator and are prohibited from reassessing the policy implications of any decision as long as they are not defective for the reasons noted above. In considering any application for a stay of execution of a regulatory order, pending full appeal, the appellate body must presume that the decision was correct. Such presumption, for purposes of temporary relief from a regulatory decision, may be rebutted, but only upon a clear showing that implementation of the decision will cause irreparable injury to the appellant, and that the appellant has a substantial likelihood of success on the overall appeal

There is also the matter of remedies that are available from the appellate body for successful appellants. It is, once again, important to keep focused on the need for consistency and application of the technical expertise resident in the regulatory agency. For

that reason, it is generally advisable that the appellate body generally refrain from interposing any remedy of its own making in the event future action is required. Accordingly, it is recommended that:

23. If the appellate body finds that a decision of the regulatory agency should be reversed and that additional corrective measures need to be taken, the preferred method for undertaking further action is to remand the matter to the regulatory agency with instructions to take such actions as are necessary and consistent with the decision of the appellate body. The appellate body may also set a deadline for re-assuming responsibility for fashioning a remedy if the regulator fails to act.

In regard to the third question of who has the legal standing to file an appeal, there are different models. In England, only the regulated company and the regulator can appeal. In the U.S. and India, any person or company who participated in the regulatory decision making process and who is arguably aggrieved by the decision, has the right to appeal. As a matter of law or Constitution, Brazil may be in a similar situation to the U.S., but if it is not clear then that question might be the subject of a public inquiry. There are, however, two qualifications that must be possessed by any appellant. It would be entirely inappropriate for a party to appeal a decision from a proceeding to which he was not a party or to raise an issue that was not presented to the regulator first. If such actions were permitted, then the regulator would effectively be supplanted by the appellate body as the forum of original jurisdiction. It is, therefore, recommended that:

24. No person or party may appeal a decision of the regulator unless that person has been a participant in the proceeding in which the decision being appealed was made. No issue may be raised on appeal that was not presented to the regulator first.

J. Consumer Advocacy Functions

The credibility of the regulatory process is enhanced greatly when all interests are adequately represented in matters before the regulators. Additionally, capable representation of all of the interests affected by regulatory decisions enriches the entire process substantively. Not only do the regulators get a broader perspective and range of input on which to base their decisions, but also the potential for negotiating an equitable result among the parties is enhanced. ANEEL, through the many opportunities it has afforded all interested parties to participate, has clearly recognized this. In the cases of all market participants as well as some of the largest consumer interests, affording the opportunity for input is sufficient. Those groups have both the resources and the motivation to participate to the fullest extent. Small consumers, however, individually, have little capability to effectively participate. They lack the resources to participate meaningfully on their own and they are generally not organized sufficiently to pool together resources on a collective basis. Fortunately, the Consumer Protection Institute (IDEC), a non-governmental organization has stepped into the breach in recent years to advocate for the interests of small, largely residential customers. They were able to do so because of funding they received from the inter-American Development Bank (IDB). Unfortunately, that funding is being terminated and the ensuing gap needs to be filled if consumers are to continue to have adequate representation.

There are a number of models available around the world that might work. One is to replace the BID funding with a small surcharge on the bills of residential customers, the proceeds of which would be used to provide IDEC or another designated organization (either non-governmental or governmental) with the means to effectively represent the interests of small customers before ANEEL. Another possibility is to assign the obligation to represent small consumers to a government agency that can finance its activities out of funds in its budget. In some places it is considered a responsibility of the Justice or some other Ministry. In other jurisdictions there is an independent government agency responsible for looking out for the interests of small consumers in regulatory matters. In still other places, there is a quasi-independent department within the regulatory agency that advocates for small customers. In the case of Brazil, given the experience and capabilities, as well as the wide recognition of IDEC, it might be best to find funding to enable it to continue its work. It is important that consumer advocacy be perpetuated on a more permanent basis. Rather than focus on the specific ways of doing so, it is recommended that:

25. ANEEL should undertake the leadership, in coordination with other governmental and non-governmental entities to find ways of permanently funding continued advocacy for the interests of small customers before ANEEL.

K. Coordination of Activities of ANEEL, ANP, And ANA

One of the most striking aspects of the evolution of energy markets in Brazil is the lack of synergy between the gas and electric markets. Although one of the major purposes of developing a gas market in Brazil is to provide a reliable fuel for thermal generating units, the most probable uses to which those plants are likely to be put is largely incompatible with

how gas must be purchased. Because the gas fields have to be developed and new pipeline capacity constructed, gas is only available on a take or pay basis. Sophisticated natural gas market mechanisms, such as secondary pipeline capacity markets or spot commodity markets, which would allow for more flexibility and efficiency, have simply not evolved. Such contractual commitments and market rigidities are clearly incompatible with the use of thermal generation as peaking units to supplement the base load hydro units. While there are a variety of explanations for the lack of symmetries between the two markets that have little or nothing to do with the regulatory agencies, the question of better coordination between ANP and ANEEL is still one that must be addressed.

It is clear that the regulatory issues in electricity are not identical to those in natural gas. Certainly, ANP has to deal with the dominant role played by Petrobras in the natural gas and petroleum markets. It also has to contend with a less developed infrastructure than that found in electricity. On the other hand, Petrobras is becoming a major player in the power sector as an investor in thermal plants, as the primary supplier of the fuel of choice for thermal plants, and as a source of subsidies for fuel purchased by generators. In short, the markets are not only symbiotic, but are actively converging. Thus, while there are differences in the two markets, the increasingly interwoven nature of the two industries clearly calls for greater coordination between the regulators of the two sectors.

ANA, a newer agency than ANP and ANEEL, has a set of responsibilities that make it also inextricably linked to electric markets. Since water is the source of energy for more than 90% of Brazil's generation, ANA's mission of regulating the water sector, including the possible monetizing of the value of water, is inextricably linked to electricity. Certainly, its policies will require coordination with ANEEL.

It was clear from the interviews that the three regulatory agencies do speak with each other. However, they do not appear to coordinate to the degree that the relationships between the three regulated industries would seem to demand. It is also not clear how well coordinated they are in such other areas of common interest as developing training programs for their staffs, creating programs for regulatory studies, in developing common appellate institutions, and in educating the public on such matters as the role and importance on independent regulation. One further advantage of closer coordination is to avoid the “capture” which often occurs in single industry regulatory bodies; namely the phenomenon where regulators take on the same mindset as is possessed by those who they regulate. Multi-sector responsibilities tend to bring in the cross-currents of new ideas from other industries, an often effective antidote to capture.

Some of those interviewed suggested, in light of the convergence between gas and electricity systems, that a merger of ANP and ANEEL might be appropriate. It was also noted that many of the technical skills required by regulation, particularly in regard to economics, law, finance, and accounting are the same regardless of the industry to which they are applied. There may be significant opportunities for cost savings in closer coordination and perhaps merger. In light of the comments above, it seems to merit study. ANA might well also be part of that study. It is, therefore, recommended that:

26. A task force consisting of representatives of ANEEL, ANP, and ANA, plus relevant Ministries and legislators be convened to study and issue a report proposing ways to achieve closer, more formal, coordination between the three agencies. Part of that study should include examination of all relevant options for closer coordination between the regulatory agencies (e.g. joint

proceedings/activities, consolidation of functions, or common rules). Particular attention should be paid to coordinating policies in the evolution of generation and fuels markets. It would be useful to engage the services of consultants to facilitate the effort.

L. Intellectual Infrastructure for Regulation

One of the common interests of all of the regulatory institutions in Brazil, including not only ANEEL, ANA, and ANP, but also state and national regulators in telecommunications, transportation, and other infrastructure industries, is to develop the intellectual infrastructure that supports regulatory activities. Intellectual infrastructure includes, but is not limited to multi-disciplinary university programs of regulatory studies, research institutions, training programs for regulators, sponsorship of conferences and seminars, journals devoted to regulatory matters, and related activities. The value of such an infrastructure cannot be understated. Not only does it offer the opportunity for greater technical capabilities within the agencies and among those who seek to participate in regulatory proceedings, but it also facilitates and perhaps even enables, the infusion of new ideas and perspectives. It helps to impose an intellectual discipline on regulatory debate and decision making that vastly enriches the process. Finally, by focusing on ideas, it makes it much more difficult for regulators to act arbitrarily or dishonestly.

There has been discussion in Brazil for years of investing in the creation of intellectual infrastructure. A few years ago the Secretary of Energy had promoted the idea of “Centers of Excellence” at universities throughout the country to promote the study of regulation. It was proposed to use a small part of ANEEL’s budget to support the effort. Although that proposal has been largely abandoned, some programs have managed to appear. It seems

appropriate to look closer into obtaining the resources to promote such activities on a sustained basis. Accordingly, it is recommended that:

27. A task force, consisting of regulators, regulated market participants, academics, and government officials be convened to propose a program for the creation and sustenance of a national program to provide the intellectual infrastructure for economic regulation in Brazil. The proposal should also include proposing a method for funding such programs, and coordination with related international activities.

L. ANEEL's Role in Planning

The role of the power sector regulator in planning is the subject of considerable controversy in many jurisdictions. In the United States, there has been an ongoing debate about it since the 1970s. In many developing countries moving from a state owned monopoly paradigm into a private ownership, competitive paradigm, there has been a fair amount of debate over what level, if any, of planning should continue. If it was decided to continue planning, in one form or another, the debate turned to the question of who should be responsible for it. Given the recent history of shortages in Brazil, it is hardly surprising that the issue is under serious discussion.

On a policy level, there are three key considerations in evaluating what role, if any, the regulator should play in planning. The first issue, of course, is to whether there should be planning at all. Certainly market enthusiasts would contend that once a market is in place, one could assume that economic signals in the marketplace will stimulate more efficient responses to demand than would any planning regime. There are some problems with this

point of view. *The first is the obvious fact, most notable in Brazil and California, that market rhetoric does not make a market.* Market making is extremely difficult, and even if it is done correctly, the signals are likely to be either inadequate or simply wrong. There are aspects of energy markets that make it questionable whether markets alone are sufficient to meet the demand for power. One aspect is the fact that the power sector is network based. Thus actions taken in one location invariably, often inadvertently, have significant effects elsewhere on the system. Thus new generating, transmission, and even consuming facilities have to be subject to at least some planning process. Another aspect is the lumpiness of additions to generation and transmission. Generation and transmission additions are often necessarily made on a scale well in excess of forecasted short-term demand. Are investors to assume the risks associated with that circumstance, or are those costs to be socialized? If the latter is the expectation, then some form of public planning process is required in order to justify socializing risks. Another aspect of the power sector is that price signals to consumers are almost always diluted for a variety of almost unavoidable reasons. Thus, there is almost certain to be some level of market failure. Because of those characteristics as well as such other factors as environmental, social, resource availability and allocation, and infrastructure considerations, exclusive reliance on markets seems a very risky leap of faith. The point is not that market mechanisms cannot work. They can, and often do result in more efficient responses to demand, but in the power sector, for all of the reasons noted, it is extremely risky to rely on market forces alone.

Once it is determined that planning, in some form is needed, then the question is who should do it. Obviously, if private investment is the source of funds for system expansion, the planning entity must be neutral as to the outcome of such competitive processes as auctions, competitive bidding, and other types of transactions found in the energy market.

The planning must be scrupulously neutral in terms of competitive outcomes. The regulator should certainly fall into the category of neutrality. It is not, however, the only neutral party who could conduct planning without bias.

While its neutrality and its competence would seem to make the regulator eligible to conduct the planning there are other factors to be considered. The first is that the regulator is fundamentally an economic arbiter in the sense that it sets and enforces the market rules and incentives, it enforces standards, establishes and administers the methodology for economic control of monopoly power, and protects the consumer from abuse of one form or another. It is most decidedly neither a market participant nor the arbiter of who should prevail in a competitive scenario. It decides matters with a blind eye to the question of who wins and who loses. Planners, while theoretically not market participants, make decisions that inherently determine market outcomes, in the sense that regulators do not. If, for example, there is a choice between transmission and generation, or even load response, to a system constraint, planners will inevitably have to decide which option to select. *Regulators should not have the burden of making such a decision because ultimately they will have to make judgments about the performance of the operator of the selected option.* In that sense, regulators, in planning, have the very same conflict of interest in planning as they do in the conduct of auctions and granting of concessions. Additionally, entrepreneurs can always come forth with proposal of their own to expand the system not contemplated in the planning process. Planners will certainly have to look at the effects of such proposals on the system as a whole. Should there be any disputes regarding those calculations, the matter would have to be resolved by ANEEL. It makes no sense to burden ANEEL with having made a planning decision and then having to sit in judgment on its own calculations. It is unfair to both regulators and to the parties seeking to resolve a dispute. Planning is also a labor intensive activity, particularly

if it is undertaken, as it should, on a transparent, participatory basis. For a regulatory agency already severely taxed in terms of human and financial resources, it is a burden that need not be assumed. Accordingly the regulatory agency should, with two exceptions, have no role in planning.

The one exception is where the planners and/or investors seek to socialize such risks as lumpiness, aspects of prudence, or the cost of effects on the system as a whole. Only the regulators should be authorized to make such a determination. While there is a legitimate policy question as to whether regulators should bless such arrangements in advance, the regulator should be left with the discretion to decide that, and may in consideration of requests for pre-approval of passing through certain anticipated costs/risks to consumers, involve itself in the planning process to that extent.

The second exception is where the planning entity adopts a plane that a party believes is decidedly disadvantageous to it, for, perhaps economic or reliability reasons. Although ANEEL, itself should not initiate inquiries to such matters, an aggrieved party may appeal the decision of the planning entity to ANEEL in order to seek relief from the alleged adverse effects. An example, would be a distribution company that believes its reliability of supply would be threatened if a particular plan would be implemented. It could appeal the planning decision to ANEEL for resolution. The alternative to resolving such a matter is for the aggrieved party to go to the courts. It seems more appropriate for such matters to be resolved by ANEEL, an agency with electricity expertise.

If ANEEL is not to be charged with the responsibility for system planning, who should be? The list of potential performers of that task includes MME, ONS, Eletrobras, CNPE, and perhaps others. There are pros and cons associated with each of those entities undertaking the task. There is also the possibility suggested by some that an independent

planning institute should be created to carry out sector planning. That idea certainly has some merit. There is also a proposal in the Congress, being vigorously debated as this report is being written, to assign planning responsibility. It is beyond the scope of this report to do anything other than recommend the role of ANEEL in the planning process. It is, therefore, recommended that:

28. ANEEL should play only two roles in the planning process. One is to determine, upon request only, whether certain costs or risks should be socialized by passing them through to consumers. The other is to adjudicate planning disputes.

M. Distribution Pricing Regime

Although the basic responsibility of the authors of this report is to look at the strengthening of the institutional aspects of the regulation of the power sector, the interviews and current debate in Brazil so clearly raised basic questions regarding the pricing of distribution services, that the authors would be remiss if they did not address that issue. The price cap system for distribution companies seemed a logical one for Brazil to adopt at the time of privatization. It was, and still is, the most common regime in use around the world. Indeed, outside of the United States, Panama, and Norway, it is difficult to think of jurisdictions where the system is not used to regulate distribution companies. It had the presumed theoretical benefits of requiring less regulatory oversight, being less complex, it tended to internalize most costs, it appeared to provide incentives for productivity gains, seemed to have fewer process and transaction costs, and it had clear boundaries between management and regulations. It appeared to offer less uncertainty than the alternatives, cost of service regulation or revenue caps. The controversies about the distribution sector,

however, which have raged in Brazil since privatization began, raise very serious questions regarding the continued efficacy of price caps.

There are three particular controversies that give reason to rethink the continued use of price cap regulation, at least as it is used at present in Brazil. The three controversies were those about quality of service, about allocation of risks, and about the economic fallout from the crisis. In regard to service quality, the initial concessions granted prior to regulation left little room for regulators to apply pressure other than through the imposition of penalties or public criticism. Such tools are generally of less value than ones that are intrinsic to the system of regulation. While the concessions could have imposed quality of service standards to accompany the price caps, they failed to do so, and that failure was compounded by the fact that the tools that might be used in cost of service regulation, for example, such as lowering the allowed rate of return or conditioning the level of receipts on service quality were simply not available to ANEEL. Perhaps more importantly, the incentives, by failing to distinguish between productivity gains and mere cost cutting, were arguably a cause of the service quality issues at some of the distribution companies. Thus, there is ample reason for consumers to feel aggrieved by the price cap regime.

The distribution companies themselves are now feeling aggrieved by the allocation of risks in the price cap system. They believe that they are being asked to assume risks they should not, and cannot, afford to bear. Those include such uncontrollable risks as currency fluctuations. The inability to open these matters up for review during the allotted life of the existing rates are as frustrating to the distributors as the inability to review the incentives was to consumers in the case of the service quality issues. The problem is not that any system is well suited to deal with currency devaluation, but rather that the price cap regimes, and perhaps revenue cap ones as well, by their very nature, tend to provide less flexibility for

adapting to suddenly altered risk profiles than are systems less focused on avoiding tariff changes before the expiration of their anticipated term.

The third controversy relates to an aspect of the economic fallout from the energy crisis. Because revenues received by the distribution companies are tied to the sales of energy, rationing took money directly away from the distributors. A different system, such as revenue caps might have created a better equilibrium between energy sales and energy services, such as end use efficiency and conservation, in incentives offered to distributors. Had distributors, for example, had revenue caps, rather than price caps, in place before and during the crisis, they would have been incentivized to sell efficient use of energy, not mere consumption. Had that been the case, obviously, the scale of the crisis and its economic legacy might have been substantially reduced.

The point being made is not to argue for replacing price caps with cost of service regulation or revenue caps. That requires a lengthy and exhaustive examination to determine. Such an inquiry seems to be appropriate. Therefore, it is recommended that:

29. ANEEL should open a public inquiry into the continued use of price caps in the regulation of the distribution companies. The inquiry should focus on the pros and cons of the existing system and on the potential benefits or pitfalls of replacing price caps with a cost of service or revenue cap system.

CONCLUSION

The purpose of this report has been to focus on possible improvements in the institutional aspects of the regulation of the power sector in Brazil. While there have been

enormous problems to confront, it is clear from the interviews that there are a large number of dedicated, intelligent people committed to improving the system. It is hope that the recommendations made in this report will provide some assistance and guidance in those efforts.

APPENDIX 1

Working Agenda – August 2002
Papel regulador e responsabilidades da ANEEL

Brasilia Rio P Alegre

Monday 5	Tuesday 6	Wednesday 7	Thursday 8	Friday 9	Sat 10
		7:00 – Travel Brasilia - Rio			
8:00 – 10:00h – S P - DF	9:00 ANA LKelman conf.	09:00 ANP Horta Nogueira - Dir	09:00 ELETROBRAS AVentura -Pres	10:30– SERGS Dilma Rousef	Travel RGS - SP
11:00 Meeting Hotel Naoum	11:00 Secretary of Economic Policy G Reis	11:00 APMPE CNascimento Dir	11:00 ABRADEE LC GUIMARAES	15:00 RGE – VARamos Dir Fin	
	13:00 Lunch – Rural Eletr Ass RGS – JStefanello Pres	13:00 Lunch ONS MSantos Pres	15:00 – PSRI – Mario Veiga	17:00 AGERGS – MA Feldman Pres	
15:30h – ANEEL – Mesquita Super Inst	15:00 MME – SNE Tatit Holtz	17:30 - TRACTEBEL M Bahar CEO	18:00 BNDES – André Sales – Ass Dir	19:00- CEEE – CCardeal Dir Oper	
18:00 – Repr José Aleluia	20:00 ANEEL – JMAbdo – Dir Gen	19:00– Dinner APINE E Westberg	20:00 Travel Rio – RGS		

ABRADEE : Brazilian Association of Distributors
APINE : Brazilian Association of Independent Power Producers
APMPE: Brazilian Association of Small and Medium Producers of Energy

APPENDIX 2

ANEEL QUERIES

T.O.R Questions:

1. **Performance Contract for ANEEL (1997-98):**

- Status in regard to goals and objectives
- Were goals realistic?
- Were goals interdependent on other agencies/actor?
- What should a new Performance Contract, if written, say?

2. **ANEEL obligation to “implement” Government “Policies and Directives.”**

- Are those policies and directives clear?
- How should policies and directives be communicated to ANEEL?
- Should policy guidance be limited to MME and CNPE (Nat. Ener. Policy Coun)
- Effect of obligation of ANEEL's independence

3. **ANEEL's technical obligations (not common for regulators)**

- hydro planning, trans modeling, and certification of hydro plants.
- Should ANEEL maintain these functions? If not who?

4. **ANEEL'S role in concession auctions:**

- Should ANEEL run auctions or merely set specifications and terms?

5. **ONS and MAE**

- Relationship between ANEEL and the two organizations?
- If ANEEL is to regulate MAE and ONS, how should it do so?
- How does governance of ONS and MAE affect ANEEL's role?
- If ONS and MAE are self regulated, when should ANEEL intervene?
- ANEEL's Resolutions 160/1/2 dissolving and reorganizing MAE
- What should ANEEL do if ONS and MAE malfunction?
- Who should do market monitoring?

6. **Delegation to States**

- What criteria should ANEEL use in delegating?
- What functions, optimally, should be delegated?
- Do all states have to be treated equally?
- ANEEL's roles in developing regulatory capacity at state level/

7. **Appeals from ANEEL**

- How have courts done?
- Are judicial decisions and patterns coherent?
- Should there be a special tribunal?

8. MAE as mediator/adjudicator?

- e.g. Annex 5 issues, Itaipu excess, contract interpretations
- Boundary between judicial and regulatory matters (e.g. MP 14, Art. 4, para. 8)

9. Transparency

- How have public hearings and consultations worked? Been perceived?
- Conflict resolution options.
- Balance between speed of decision making and transparency?
- How transparent are processes, and how do parties perceive them?

10. Scope of jurisdiction for ANEEL.

- Relationship to licenses issued before ANEEL existed.
- What needed jurisdiction does ANEEL lack?
- Coordination between electric and gas policy/regulation.
- Need to clarify ANEEL's authority? Where?

11. ANEEL Passivity

- Has ANEEL been sufficiently proactive? Where and Where not?
- e.g. relationship between minimum contracting requirements and retail competition)

APPENDIX 3

WORKING AGENDA – OCTOBER 2002

Fortalecimento institucional do setor elétrico e as relações entre seus diversos atores – O papel da ANEEL

Sao Paulo Fortaleza Curitiba Brasilia

Thursday 10	Friday 11	Saturday 12	Sunday 13	Monday 14	Tuesday 15	Wednesday 16
	10:00 - IDEC Leo Sztutman	10:00 COELCE Celestino Izquierdo		09:00	10:30 – ANA	ANEEL 09:30 18:00
12:00 Ildo Sauer - IEEUSP	11:30h MAE L.Paixão	12:00 ARCE Jurandir Picanço		11:00 COPEL-LF VIANA	12:00 – Min Plan J Levy	ANEEL A.Mesquita
14:00 CSPE Zevi Khan	13:30 AES Demostenes		14:30 SP / CT	14:00 – ABRACELL Walfrido Avila		ANEEL
16:00 – Gesner Oliveira FGV	15:00 FIESP Pio Gavazzi	15:30 FO / S. Paulo			15:00-MF Secretary of Economic Policy Arno Meyer	ANEEL C.Girardi
17:00-CITI-C. Kawall–chief economist					17:00 MME F.Gomide	ANEEL
	20:40 SP-FO			18:00 CT - DF		19:00 DF-SP

APPENDIX 4

TRANSPARENCY: ITS IMPORTANCE AND ITS ELEMENTS

If there is a single concept that is absolutely critical to the successful implementation and conducting of a regulatory process it is transparency. The process, the reasoning, the mathematics, the logic, the transactions, the administration, and the mechanics of regulation must be absolutely transparent to all if the system is to inspire confidence in it. Without that confidence, investors will not risk their capital, consumers will not tolerate adverse rate changes, politicians will not refrain from tampering with the process, and restructuring will be but an empty shell. Transparency is the glue that holds the regulatory compact together. So, what is this glue made of? What is transparency? Why is it so important?

The importance of transparency and its key linkage to the inspiration of confidence is that transparent regulation conducts in business in the full light of day, in full view of anyone who cares to watch. While the intricacies of regulation can be quite arcane and complex, the manner in which the work is done is simple and plain. The integrity of the decision makers, their reasoning, the facts and arguments that they consider, the process by which decisions are made, and the rules by which all must abide are clear, are well known, are verifiable, and are manifestly resistant to unethical, unlawful, or unfair tampering. Equally important is the existence of transparency in the markets that are subject to regulation. The transparency of the transactions that occur within the regulated scope of activity serve as a further guarantee that the process has led to results that, while some may not like trends in the marketplace, is at least straightforward and honest from a business perspective. If there are problems in the transactions that are occurring, the transparency of the market and the institutions that do business in that market makes it likely that either the market will correct itself or

that the problems will be apparent and the regulators will be signaled, either on their own initiative or through the urging and complaints of those who feel aggrieved by the problems, that they need to intervene to fix the problem. While there may well be differences in the degree of openness that is required from one culture to another in terms of what constitutes socially acceptable forms of decision making and conducting business, the fundamental principles are universally applicable, particularly in the context of the global marketplace, the mobility of capital, the need for transactional stability and security, and the needs of international credit institutions, the increasing awareness of consumers induced by inflation, increased choice in the marketplace, and economic reform. While there is no single factor that defines transparency in regulation, it is useful to examine six aspects of it that are critical. While no single one of these aspects can guarantee transparency, the absence of it in any one of the six areas can deprive the process of its transparency. The six aspects are as follows:

1. The integrity and independence of the decision makers;
2. The integrity and logic of the reasoning process;
3. The integrity of the evidence considered;
4. The integrity of the decision making process;
5. Clear and verifiable rules;
6. Financial transparency.

It is useful to conceptually explore each of these areas individually.

1. INTEGRITY AND INDEPENDENCE OF THE DECISION MAKERS

The integrity and independence of the decision makers is, of course, absolutely mandatory. They must not only be incorruptible, but must refrain from any type of activity or involvement that might even give the appearance of impropriety. They must also be insulated from and independent of politics and near term political impact of their decisions. Some of the rules in this area are clear. Bribes of any kind, or even small favors that give the appearance of special favors must be absolutely prohibited and violators subject to removal from office and criminal prosecution.

There are, however, a number of more subtle rules that the regulatory agency itself can adopt that will strengthen the perception of honest decision makers. Such rules include requiring the public disclosure by agency directors and critical staff members of all of their major financial interests to make it clear that they hold no financial interests that are either in conflict, or even appear to be in conflict with their official duties. A flat prohibition on the ownership of any financial interest of any kind in any business subject to the jurisdiction of the agency is also warranted. A requirement that a director or critical staff member remove himself/herself from any involvement in a case where he or she does have an actual or apparent conflict of interest is also warranted. In some regulatory bodies, a member of the agency may be removed from voting on a particular matter where a majority of his/her colleagues have concerns, based upon a demonstrated and publicly stated actual or apparent conflict of interest or improper conduct of some kind. Such removal can occur, however, only on the public demonstration of a cause for such an action. Limitations on a director or key staff person that prohibit their employment by a jurisdictional company or working on matters pending before the agency for some period of time after that person has ceased being a member is another restriction that closes off certain temptations that might appear to influence a

decision maker (such restrictions are known as Revolving door rules). A prohibition of *ex parte* communications, or, at a minimum, a rigidly enforced requirement that such contacts be subject to full disclosure will go far to assure even the most skeptical of observers that the decisions made are not the result of a cozy, quiet little arrangements among friends.

In addition to limitations on the conduct of decision makers there are appropriate protections that can be built in to assure independence and shield regulators from improper influences. Regulators serve fixed terms and cannot be removed from office without a demonstration of sufficient cause for doing so; sufficient cause arising only from demonstrated malfeasance or non-performance of duty. Mere disagreement with a director's position on a matter, no matter how unpopular that position is, does not constitute grounds for removal. The salary and benefits of directors can be set out specifically at the time a person is appointed to the position and changes from that can be prohibited during the term of office in order to preclude the possibility of punishing or rewarding a director for a decision that he or she made in good faith performance of duty.

In summary there are a variety of institutional mechanisms that can be put in place to either regulate the conduct of decision makers or to protect them from improper manipulations or temptations. It goes without having to say so, of course, that the first and most important protection is the appointment of high minded, dedicated, public servants to the agency. The personal integrity, independence, and personal commitment to integrity of the decision maker are of paramount importance.

2. INTEGRITY AND LOGIC OF THE REASONING PROCESS

An essential component of the integrity and transparency of the regulatory process is its intellectual foundation. It is that basis in logic and reason that precludes both arbitrariness and too much politicization of the process. Indeed, it is also an antidote to corruption. While there are many policy and other decisions on which reasonable people could very well disagree, and, indeed, the agency may well make decisions that directors themselves may well, in hindsight, come to regard as mistakes, the decision must be at least justifiable on intellectual, policy, and factual grounds. In short, transparency of the process does not necessarily demand that the correct result is always reached. Human beings may well make errors or reasonable judgments with which other people may well disagree. It does, however, demand intellectual rigor, well-reasoned decision making, and coherent policy. While such a standard requires intelligence, honesty, diligence, and perhaps even courage on the part of the regulators, transparency demands something more; those qualities must be demonstrated.

The demonstration of intellectual rigor and honesty is not easily accomplished, particularly in areas where there are many advocates on all sides with very different points of view, none of them per se unreasonable. It can only be accomplished by a disciplined and consistent effort over time to explain the rationale for each substantive decision taken. That rationale should almost invariably include the policy objectives sought or being pursued, an explanation as to how the measures being taken will contribute to the policy objectives articulated, and such other considerations as went into the decision. When one of the directors disagrees with the majority on a decision that is taken that director should issue a separate, dissenting opinion setting forth a full explanation for his/her disagreement. Similarly, when a director agrees with the outcome but does so for different reasons then

those set forth in the opinion of the majority, he/she should write a separate, concurring opinion setting forth the reasons for the agreement and disagreement. The reasons for the issuance of separate opinions is to stimulate debate on the subject being discussed, for the dissenting or concurring director to set out a record which might be used, by either the agency, a Court, or even another policy maker in the future to change policy direction, to simply protest a decision, or perhaps some other rationale. The issuance of such opinions, however, serves two vital institutional interests. The first is that the ability of any one of the directors to speak out helps to keep all of the directors intellectually honest, rigorous in thought, and serious in purpose. Secondly, and of at least equal importance, separate opinions, particularly ones that are well reasoned, provide very clear indications of thoughtful debate and careful analysis that can go far in presenting a decision making process that is intellectually honest, rigorously analytical, well reasoned, and utterly transparent. Ironically, even poorly reasoned opinions can serve the cause of transparency because the reasoning stands naked and unmasked before all.

At the Federal Energy Regulatory Commission as well as a number of state regulatory agencies in the United States, it is common to have what are known as Sunshine Laws[®]. These laws prohibit any discussion of matters pending before a agency by directors (unless it is only a minority of the directors in those states that have 5 or 7 directors; for a three member agency, such a law would make it impossible for any director to informally talk with a colleague about anything related to a matter pending before the agency) outside of an official, publicly announced meeting of the agency. The idea is that all relevant discussion should take place in the Sunshine[®] (i.e. in public). While these laws are designed to accomplish an even greater measure of transparency, many observers believe that they are counterproductive in that the public discussions are less frank and open than they should be,

indeed, are often quite sterile, that the real decision making authority is effectively transferred from the directors to the staff who are able to communicate among themselves, and that the quality and accountability for decision making is thereby reduced. Transparency, while of paramount importance, may have to be balanced against the need for colleagues to talk frankly and quietly among themselves in deciding the serious matters before them. In achieving that balance, however, one should never lose sight of the critical importance of transparency.

The critical element on the reasoning and integrity implicit in the regulatory process is that no substantive opinion is rendered without full explanation, that directors clearly reveal the thought process by which they arrived at their decision(s) and opinion(s). All parties have a right to know the reasoning process. Even if some people may disagree with the reasoning and/or the conclusion, the publication of an explanation for every decision will add immeasurably to the transparency of the process, and thereby render disagreement matters of substance and not a matter of how fair or honest the process itself was.

3. EVIDENCE CONSIDERED

As important as the exposition of the reasoning of the decision makers is, it alone does not achieve transparency. The context of the discussion and debate that preceded the rendering of the decision is of at least equal importance to achieving transparency. It does little for the credibility of the agency to render a perfectly reasoned decision based on facts that are hidden from view. Consumers angry about a price increase are not going to feel less aggrieved because the agency had secret information, not available for anyone to scrutinize, upon which it based a decision to raise prices. Similarly, no one is likely to risk their capital in a regulated market where the regulators make decisions based upon information that they are

unwilling to share, have examined by others, or perhaps not even disclose the nature of. Indeed, transparency demands that not only the decision and the reasoning behind it be publicly exposed, but that all of the evidence, be it fact, opinion, or argument, that was presented to the decision makers in an effort to persuade them be similarly unveiled on the public record.

There is little way to completely expose the entire basis upon which opinions are formed that lead to particular decisions. Everyone is the product of a personal background which colors their world view and that is likely incapable of exposition. On the other hand, those facts and arguments that were presented on a particular matter and which shaped a decision maker=s view of a particular set of circumstances are capable of exposition. Accordingly, it makes sense to make a formal record of the information, all of the information that was provided to the agency on a particular matter. There are two critical elements to that record in order to attain transparency. The first is that all of the information that was submitted on the matter is included in the record, including the transcript of any formal proceedings that occurred. The second is that all of the information is open and available to anyone who wishes to see it. Indeed, there should be a presumption that all of the records in possession of the agency are public records open to anyone. Transparency requires that there be a presumption that all documents in possession of the agency are public documents open and available to anyone who wishes to see them. While it is reasonable that the agency retain authority to deem a document Confidential,” that authority should be used sparingly, and only upon a very clear demonstration of the need for confidentiality by a party who is seeking such a designation for a document. As a matter of practice, it is probably not wise for the agency to designate a document as confidential on its own unless it is an internal personnel document, an early draft of a proposed action or

decision by the agency that is not yet ready for release, a security matter, or matters that are related to litigation in which the agency is or is likely to be involved, such as a matter pending in the courts.

The simple principle that should be followed if transparency is to be achieved is that both the reasoning and the information upon which that reasoning is based should be public and open to public exposition. Absent compelling circumstances, no information should be withheld from public view.

4. DECISION MAKING PROCESS

In the effort to achieve transparency, there can be no substitute for making certain that all parties having an interest in the outcome of a particular matter are afforded a full opportunity to provide meaningful input into the decision making process. Along with that must come the absolute assurance that the decision making process is that which is conducted at the regulatory agency, and that there be no political interference or *ex officio*, informal influences from, or decision making by higher level officials. The regulatory process must be the only process by which decisions are taken. The credibility of the agency and of the regulatory process in general would be ill served if decisions were taken without public notice that they were being contemplated, without the opportunity for the diverse affected interests to express their views and offer their evidence in some meaningful way in the process, and without assurances that the regulatory process cannot be bypassed through non-transparent dealings with “higher level” officials of the government. Independence of the regulatory agency in decision-making is a critically important element of transparency. For there to be transparency key elements of the process should include:

1. The public notice that a particular matter is under consideration at the agency (indeed, all applications, formal complaints, agency initiatives, and whatever else is undertaken by the regulator body should be the subject of publication at the time an action or application is initiated at the agency);
1. Ample opportunity for anyone, either a formal participant in the process or perhaps just a residential consumer with an opinion, who wishes to provide the agency with input on a particular matter to do so;
2. The maintenance of a formal, publicly available, record of all arguments and evidence provided to the agency on a particular matter which constitutes the entirety of the information upon which the agency will make its decision;
3. Ample opportunity for a person or entity interested or materially affected by the outcome of such a proceeding to not only offer all of the relevant arguments and evidence which it believes the agency needs to consider before taking its decision, but also to examine, test, and respond to all of the opinions and evidence offered to the agency by other parties, many of whom have quite diverse and possibly adverse interests to advance; and
4. The decision will be taken by the regulators independently, without any political or other influences outside of the ordinary regulatory processes. Additionally, the simpler the decision making process is the less likely it is that there will be confusion or procedural disputes, and conversely, the more likely it is that the entire process will be more accessible and more immune to manipulation. The central concept is that anyone with any interest in knowing the totality of what the agency has before it in a pending case will have access to that information, no one participating in a particular matter will be precluded from knowing precisely what information the agency has before it on

which to base its decision, and that the regulators are not being subjected to “unseen”, “off the record,” political or other improper pressures.

In establishing the process, the agency will want to make certain that it accomplishes three very important goals:

1. Making certain that the process is truly transparent in that the entire process of initiating a case for consideration and letting it be known that the matter is undergoing a decision making process at the agency, gathering information, examining and considering that information, the reasoning process for coming to a conclusion, and the decision itself;
2. Assuring that everyone and anyone who wishes to participate or provide input on a particular matter has ample opportunity to do so at whatever level a party wishes to do so, ranging from full participation to the simple act of merely offering an opinion;
3. Assuring that the agency gathers all of the relevant information necessary on a particular matter, that that information is tested in some meaningful way in order to distinguish what is reliable and what is not, what is of value and what is not, and making whatever other judgments need to be made about information in order to enable the agency to make a well informed, well reasoned decision.

5. CLEAR AND VERIFIABLE RULES

Transparency would be impossible to attain in the absence of clear, fully articulated, publicly known, and consistently applied rules and policies regarding the criteria to be applied in making various types of decision, the public policy objectives the agency is pursuing in making various types of decisions, the expectations and obligations of licensees, and the process by which decisions will be taken. Anyone having business before the agency,

regardless of whether that party is a licensee or just a simple consumer, is entitled to know how the agency will conduct its business. The inability to know that information will render meaningful participation before the agency virtually impossible thereby putting the confidence of both capital investors and consumers at considerable risk. It is, therefore, very important that the agency use consistent and predictable terms and conditions on licenses applied with little or no discrimination (if there are deviations from the norm, the basis for each such deviation should be well documented), that the agency adopt and publish rules which, among other things, set forth:

1. The precise nature of the procedures to be followed in making decisions;
2. The standards (including explanation of the burden of proof) that the agency will apply in evaluating the performance of, or complaints against, licensees (e.g. quality of service for monopoly providers or anti-competitive behavior by jurisdictional companies in competitive markets);
3. The public policy goals that the agency is pursuing;
4. A statement of the rights and obligations of consumers;
5. The terms and conditions governing access to the records of the agency (the rules should be quite liberal, but the smooth operation of the agency might require such reasonable limits access only during regular business hours, reasonable charges for copying expenses, prohibition on the defacing or alteration of documents, etc.);
6. Such other matters which may be necessary for the agency to conduct its business in an open, transparent, independent, and publicly accessible fashion.

While a significant part of the value of adopting and publishing rules and letting policy objectives be known is to attain stability and predictability in the process, the status quo need

not endure forever. Changes are likely to be necessary or beneficial from time to time. Accordingly, the process for making changes in the rules should also be set forth, and that process should also be quite open and accessible for anyone to participate. The principles that should be honored consistently are complete openness on what is contemplated in terms of the subject matter under consideration, public notice that matters are pending, and ample, meaningful opportunity to participate. Stability and predictability in honoring those principles even when contemplating changes in previously adopted rules should be sufficient to maintain public confidence in the regulatory process even in the midst of change.

6. FINANCIAL TRANSPARENCY

As important as transparency is in how the agency conducts its business, it alone, is not sufficient to assure the transparency of the entire regulatory process. To achieve the desired level of transparency, the financial and other transactions that occur within the scope of the agency's jurisdiction should also be transparent. The workings of the markets, the financial records of monopoly licensees, the power sales of the generating companies, annual reports of licensees, and perhaps other financial records should be accessible as public records at the agency. In order for those records to be easily understood and meaningful, the agency will need to adopt reporting requirements and accounting standards with which licensees will need to comply as part of their license conditions. The agency will need to further require, as part of its license conditions that licensees comply with all reasonable information or data requests from the agency. The regulatory agency may well want issue periodic reports on the operations of the market, reports that are replete with market information.

The critical factor is that the market be open, that financial data be available and accessible, that consumers and investors alike have access to systematic and meaningful

information on the market, and that the regulators will have the information that they require in order to maintain their requisite level of scrutiny over the market. Such transparency will not only go far to providing assurance to both investors, but will, if consistently demanded and enforced, also provide the side benefit of exposing shortfalls in revenues or non-cash transaction.

The importance of financial transparency cannot be overstated. Indeed, the transparency in the regulatory process is designed to build confidence and credibility in the system of regulation. The ultimate proof of whether such confidence is merited or deserved is derived from the actual operation of the market itself. It is financial transparency that will provide the ultimate evidence of whether the system is working as it is envisioned to do so, and whether the public interest is being well served.

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3. Review of new competitive bidding guidelines of GOI for power generating stations

Draft comments on PPP in Generation of Electricity:

Draft Model Power Purchase Agreement (MPPA)

1. Salient Points

- The MPPA envisages a Design Finance Build Operate and Transfer (DFBOT) model
- Fixed charge is the only parameter by which the Concessionaire is to be selected.
- Fuel Charge is a pass thru.
- A Station Heat Rate (SHR) has been specified and incentives in the form of enhanced fixed charges has been provided in case of the Concessionaire improve on the specified SHR. The SHR is to be measured and certified at regular intervals as per the relevant codes.
- A long term Fuel Supply Arrangement (FSA) for 20 years is envisaged.
- Availability of 90% has been specified.
- Independent Engineer (IE): The MPPA creates the position of an IE, who will be entrusted with powers of validation, verification and authorization both during the EPC and O&M stages.
- Financial Closure: within 180 days.

2. Comments

2.1 Overall Principles

- Build on XI Plan Success with Case 1 and Case 2 bidding documents, which were accepted by developers, regulators, banks and other agencies. There is a need for incremental changes to resolve outstanding issues with the draft document (like reducing number of bid parameters, inappropriate risk allocation between Fuel Supply Agreement and corresponding Power Purchase Agreement, pass through of fuel cost for stations using domestic coal through linkage as well as imported coal, inadequate penalties for delayed commissioning, etc).
- Avoiding tendency for micro regulation, while retaining random III party checks and a clearly enunciated dispute resolution mechanism that allows for mid course correction under specified circumstances. Detailed mechanisms for review of performance across multiple parameters have not been optimal in Indian context with constraints of institutional capacity.

2.2 Specific comments on Issues/ Clauses

- **DFBOT** has not been adopted for large Thermal Power Plants in any other major country (including where PPAs are signed with IPPs).
- **Fixed charge** This ensures recovery of fixed costs (investments and operation and maintenance (OPEX)).
- **SHR:**

- A coal fired power plant is generally designed to operate on three types of coal which are designated as – ‘Best’, ‘Design’ and ‘Worst’ coal. While the plant has to operate between a band i.e. ‘Best’ and ‘Worst’ the guarantees are given for the ‘Design’ coal and correction factors / curves are used to correct the Performance Guarantee (PG) test reading to the ‘Design’ coal.
- A full-fledged PG tests are usually carried out as per the relevant test codes after first commissioning and subsequently after R&M / LE (which occurs at 200,000 hours roughly 20 years at 90% Availability Factor), using high precision calibrated instruments at times specially installed for the test. Simplified tests are carried out during normal operations using plant instrumentation.
- The OEM guarantees the Turbine Heat Rate and the Boiler efficiency w.r.t. the conditions specified in the Bid documents, like – Frequency, Ambient Temperature, Coal quality, load to name a few. These could vary to a certain extent (within the specified band) at actual Site conditions, and correction factors / curves are applied to arrive at the guaranteed HR. Again the PG test is a snapshot and SHR determined cannot be assumed to be the same over the year. SHR is also subject to degradation over time and the relevant test codes make provision for the same. Good O&M and periodic overhauls can only recoup a part of the degradation.
- So specifying a single SHR without any degradation and carrying out regular PG tests may not be acceptable to the bidding community. Also frequent testing and adjustments in tariff may not be a feasible option.
- A long term **Fuel Supply Arrangement (FSA)** might not be available in the current market, especially in international market for imported coal.
- **Availability:** Long term sustained Availability of 90%, for 30 to 40 years with Indian coal seems to be ambitious.
- Also a coal fired plant requires Renovation & Modernization after around 100,000 hours and Life Extension after 200,000 Hours of operation, which has not been factored in the MPPA.
- **Independent Engineer (IE):**
 - A large Thermal Plant encompasses many disciplines ranging from – Civil, Mechanical, Electrical, Control & Instrumentations, Planning to name a few. Again areas of expertise is also varied- Civil Foundations, Boiler, Turbine, Pumps, Fans, Compressors, Coal Handling, Ash Handling, Water Systems to name a few. To our knowledge IE’s having experience in all areas and disciplines of a TPS are not available in the market who can cover all the phases of EPC and O&M.
 - The concept of IE for large Thermal Power Plants may result in micromanagement which might not be acceptable to the Concessionaire.
 - Article 13.3: Tests- These are generally agreed upfront between the equipment supplier and owner in the form of Quality Assurance Plan and are standardized. Additional tests by IE would add to the cost and time schedule.
 - Article 19 – Monitoring of O&M: Having an IE would result in subjectivity, which could lead to collusion or unnecessary litigations.
- **Performance Parameters:** Performance parameters of the power plant running on coal meeting the technical specifications is to be guaranteed by the concessionaire during each month of a 20 year period where specific values could be considered for each year during the period for (i) availability (excluding scheduled maintenance); (ii) net capacity (MW); (iii) net heat rate at different load regimes (based on simplified tests using plant instrumentation). An

option could be to make it in line with the current CERC Normative Parameters and the KPI's, that primarily measure availability only.

- **Financial Closure:** within 180 days may be difficult to achieve.
- **Damages for delays:** need to be equitable between the Utility and Concessionaire.
- Article 8 “**Disclaimer**”: might increase the risk for Bidders, as the Utility would need to take some responsibility for the Data provided.
- Clause 10.3.5: **Right Of Way (ROW)** has to be given for the complete area, for unlike Roads a power plant has to follow a construction sequence and cannot be built in patches.
- Article 22 - Allocation of Capacity: The process is complicated and would be problematic in implementation
- Article 25 – **Tariff:** The clauses need to be simplified. For example *even if the concessionaire meets the overall yearly availability of 90%, he could still end up paying damages on account of Fuel Shortage, monthly non availability, exceeding the scheduled maintenance period to name a few.*
- Article 26 - **Fuel Charge:** Is a pass thru:
 - But a very complex mechanism has been developed which would be difficult to implement during actual operations in a large thermal power plant. The clauses need to be simplified taking into account the comment on SHR, mentioned earlier.
 - Accounting for the different types of fuel and linked generation would be an implementation challenge.
 - Relevance of WPI to coal needs to be established. GCV accounting fuel wise and stocking coal in different stacks may not be feasible.
 - Reporting daily fuel stock would be challenging. Measuring improvements in SHR every quarter may not be feasible.
 - CIL generally does not supply the agreed quantity and quality of fuel.
 - Technical specification of coal (Best, Design and Worst) that the plant should be able to burn. This is particularly crucial if the concessionaire will not have full freedom to procure the fuel (will be obliged to run the plant using coal supplied by Coal India or other sources as defined by the Government of India).
- Clauses relating to Additional Fuel Supply, Concessional Fuel, Dedicated Capacity, Open Capacity, and Additional Capacity are complex and could lead to legal challenges.

3. Alternatives from other countries

Other countries have adopted some other models on passing through increases in fuel prices. In the case of Japan, the variability in the cost of imported steam coal is passed on to consumers through a fuel price adjustment system. The weighted average fuel prices for coal, LNG and oil for the most recent three months are reflected in electricity tariffs two months later, subject to a maximum increase of 50%. This maximum of 50% helps prevent excessive increases in tariffs for the consumers and ensures the incentives for power producers to buy the cheapest fuels. This provides a cap on increase in electricity price. The electricity amendment system has been rigorously applied in Japan since it was introduced in 1996. It is imperative that some cost pass-through is to be allowed to prevent building-up massive deficits by generators using coal, while ensuring incentives for generators for efficient procurement of coal.

China's National Development and Reform Commission (NDRC) introduced a policy in 2004 on "*Coal and Electricity Price Co-Move*" which mandates pass through of coal price increases under some circumstances. When the average coal price increases by more than 5% within a period of six months, 70% of the increase is passed through to the end-users through increase in grid tariffs, while the remaining 30% is absorbed by the power producers. However, several other political economy factors affect the determination of power tariffs in each of the provinces, guided by the principles of economic growth and social stability, and implementation of the centrally-issued directives depends on local and provincial decision makers. Recently, electricity tariff increases did not match the rapid increase of coal price resulting in large deficits for power generators. However, it should be noted that China's position as the world's largest producer *and largest*¹ importer of coal provides it unique flexibility in price arbitrage in internationally traded coal. Domestic and international coal trade co-exists, with supply choices driven by the goal of cost minimization for the individual power companies, where China could absorb 15-20% of the internationally traded coal or none.

¹ Richard K. Morse and Gang He: *The World's Greatest Coal Arbitrage—China's Coal Import Behavior and Implications for the Global Coal Market*, Stanford Program on Energy and Sustainable Development, Working Paper #94, August 2010