e8-GEF-UNDESA
Financing Sustainable Electrification Dialogues HCB Initiative

South-East Asia Workshop
Bangkok, Thailand, September 8-10, 2009

What is Necessary for Lower Carbon Power Project Development?

Toyoto Matsuoka,
Director, Corporate Planning Department,
Tokyo Electric Power Co. (TEPCO), Japan
TEPCO: An e8 Member Company

• 10 major electricity utilities from the G8 countries
1. Introduction
Who is TEPCO?

- Principal Service Area: Tokyo metropolitan area
- 10% of Japan’s land area (39,527 km²)
- 34% of Japan’s population (44 million people)
- 40% of Japan’s gross domestic product
- 33% of Japan’s electricity power market
TEPCO Company Highlights

- Established in 1955 as a 100% investor owned electric power company
- Vertically integrated power company
- Electricity sales: 288,956 GWh (FY 2008)
- Peak demand: 64.3 GW (July 24, 2001)
- Number of customers: 28.51 million (Period ended March 31, 2009)
- Annual revenue: 5,295.9 billion yen (FY 2008)
- Power generation capacity: 62.5 GW (As of March 31, 2009)
TEPCO Power Generation

- Thermal: (36.2 GW)
- Nuclear: (17.3 GW)
- Hydro: (9.0 GW)
2. Minimizing CO\textsubscript{2} Emissions
Advanced Nuclear Power
Advanced Boiling Water Reactor (ABWR)

Kashiwazaki-Kariwa Nuclear Power Plant

- TEPCO owns and operates 17 reactors: 17.3 GW nuclear power facilities
- The power production cost of nuclear power is the cheapest in Japan
Advanced Gas Combined Cycle Thermal Power Facilities

Kawasaki Thermal Power Station

• TEPCO owns and operates natural gas-burning power facilities (23.7 GW)

• The most energy-efficient power production system in the world: 59% thermal efficiency

• TEPCO imports 20 million tons/year of Liquefied Natural Gas (LNG)
Ultra-Super Critical Coal Fired Thermal Power Facilities

• USC: A very efficient clean coal technology
Pumped-up Storage Type Hydro Power Stations

Kamikochi, Nagano

• Pumped-up hydro power stations work as batteries for the network to meet the peak demand

• TEPCO owns and operates nine large-size pumped-up hydro stations
Renewable Energies

• Eurus Energy, an affiliated company of TEPCO, is the biggest wind power generator in Japan

• Eurus owns and operates 1,827MW wind turbines in USA, Spain, Italy, UK, Korea and Japan

• Micro Hydro, Biomass, geothermal and Solar PV
Environmental Protection

~ TEPCO’s data

- Sulfur oxides: 0.16g/kWh
- Nitrous oxides: 0.19g/kWh
- \( \text{CO}_2 \): 0.339kg-\( \text{CO}_2 \)/kWh
3. e8 Projects
e8 Indonesia Project (1)

- Indonesia
- Solar Home System (200 Households)
- Completed in 1999
e8 Indonesia Project (2)

- Indonesia
- Micro Hydro Project (4 Sites: 146kW)
- Completed in 2000
e8 Indonesia Project (3)

- Indonesia
- Solar/ Wind/ Diesel Hybrid System Project (52kW)
- Completed in 2000
e8 W-Park Project

• Benin, Niger, Burkina Faso
• Solar (PV) Power Project (7.5kW)
• Completed in 2003
e8 Bhutan Project

- Bhutan
- Micro Hydro Power Project (70kW)
- Completed in 2005
e8 Galapagos Project

- Ecuador
- Wind Power Project (2.4MW)
- Completed in 2007
e8 Tuvalu Project

- Tuvalu
- Solar (PV) Power Project (40kW)
- Completed in 2008
e8 Philippine Ifugao Project

- Philippines
- Mini Hydro Power Project (200kW)
- On-going
4. e8 Philippine Ifugao Project
Ifugao Province
Rice Terraces

Ifugao Rice Terraces: A UNESCO World Heritage Site
World Heritage in Danger

Damaged rice terraces
Project Objective

• Support local activities to conserve the 2000 year-old Ifugao rice terraces;

• Provide a model of local, sustainable energy-based development and regional vitalization;

• Promote the development of sustainable mini-hydro power resources in the rural areas of the region and the Philippines.
Project Outline

- 200kW capacity mini hydro power plant
- Rice Terrace Conservation Fund
E8/Philippine DOE Signing Ceremony
Ground Breaking Ceremony
Project Timetable

- **Jul.2008**: Signed MOA (DOE/Ifugao Province/e8)
- **Aug.2008**: Signed energy sales agreement
- **Dec.2008**: Signed contract with local company, “Alfalfa” and groundbreaking ceremony
- **Dec.2009** (projected): Completion of construction and inauguration ceremony
- **Jan.2010**: Transfer assets to the Philippines DOE
- **Jan.2012**: Two-year monitoring phase ends
Success Factors of the Project

• Support from the Central Government
  - Renewable energy policy
  - Mini Hydro project development guideline
  - Regulations for Environmental Impact Analysis
  - Participation of the DOE engineers

• Local community’s preparations
  - Local Government’s excellent leadership
  - Local community’s involvement

• Support from the local electric power cooperative
  - Power purchase agreement
  - Engineering support
Potential Risks Facing Us

- Financial Issues / Macro Economic issues
- Environmental Issues
- Institutional Issues
  - Political risks
  - Local preparations
- Project Viability
  - Construction Risks
  - Market issues
  - Management Risks
- Human Capacity
5. TEPCO’s Commercial Project
TEPCO’s Overseas Investments

3,634MW generation capacity outside of Japan
TEPCO Overseas Business Policy

✓ A project to benefit the host country/community

✓ A project to utilize technical/management skills

✓ A project with good partners

✓ A project with reasonable returns
Risk Assessment

- Environmental risks
- Political risks
- Macro-economic risks
- Commercial risks
Environmental Risks

• Natural environment

• Social/cultural issues
Political Risks

- War, terrorism, social unrest
- Change in leadership officials
- Change of laws, regulations, breach of contract and court decision
- Expropriation
- Currency conversion and transfer
- Corruption
Macro-economic Risks

- Recession, electricity demand decrease
- Inflation
- Exchange rate fluctuation
Commercial Risks

• Market risks
• Completion risks
• Operation & maintenance risks
• Revenue risks
• Fuel supply risks
• Partners
• Force majeure
More Considerations for Renewable Energy

- Uneven resources: wind, sunshine, water, etc.
- Additional environmental risks: birds, fish, vegetation, landscape, etc.
- Higher costs per kW, Lower return to investment
- Less attractive for Investors, Lenders?
- Needs accessibility to local power grids: standards, excess capacity of the power grids
- Needs renewable energy policies of the host country: goals, standards, implementation subsidies, tax policies, tariffs (feed-in-tariffs), etc.
- Difficulties of maintenance in remote areas
More Considerations for Rural Electrification

- Lower returns: Who finances?
- Leadership of the central/ local governments
- Institutional preparations
  - Policies, laws, regulations, permissions, etc.
  - Involvement of local communities
  - Good local partner, good site manager
- Human capacity building: Management capacity & Technical capacity
- Involvements of local power authorities, engineering companies, & manufacturers, etc.
6. Conclusion
Keys to Success

• Host country government
• Local community
• Local electric power utility
• Human Capacity
• Finance!!
## General Information About KANSAI

### Density of electric demand
(Kansai vs All of Japan)

<table>
<thead>
<tr>
<th>Land area</th>
<th>Population</th>
<th>Electricity sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansai area</td>
<td>8%</td>
<td>16%</td>
</tr>
</tbody>
</table>

### Corporate data (fiscal year ended March 31, 2009)

<table>
<thead>
<tr>
<th>Date of establishment</th>
<th>May 1, 1951</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid-in capital</td>
<td>489.3 billion yen</td>
</tr>
<tr>
<td>Number of common stock issued</td>
<td>962,698 thousand</td>
</tr>
<tr>
<td>Total assets</td>
<td>6970 billion yen (consolidated)</td>
</tr>
<tr>
<td>Generating facilities</td>
<td>Hydro 8,190 MW (148)</td>
</tr>
<tr>
<td></td>
<td>Fire fossil 16,410 MW (12)</td>
</tr>
<tr>
<td></td>
<td>Nuclear 9,770 MW (3)</td>
</tr>
<tr>
<td></td>
<td>Total 34,360 MW (163)</td>
</tr>
<tr>
<td>Total electricity sales</td>
<td>145,870 GWh</td>
</tr>
<tr>
<td>System Peak Demand</td>
<td>33,060 MW (August 2, 2001)</td>
</tr>
<tr>
<td>Ordinary revenues</td>
<td>2,790 billion yen (consolidated)</td>
</tr>
<tr>
<td>Operating loss</td>
<td>13 billion yen (consolidated)</td>
</tr>
<tr>
<td>Net loss</td>
<td>9 billion yen (consolidated)</td>
</tr>
<tr>
<td>Number of employees</td>
<td>22,113</td>
</tr>
</tbody>
</table>

### Figures in brackets are numbers of power plants

**Kansai area**
- 8% of land area
- 16% of population
- 17% of electricity sales

**Kansai electric**
- 8% of land area
- 16% of population
- 17% of electricity sales

**Kyoto**
- 8% of land area
- 16% of population
- 17% of electricity sales

**Osaka**
- 8% of land area
- 16% of population
- 17% of electricity sales

**Kobe**
- 8% of land area
- 16% of population
- 17% of electricity sales

**Density of electric demand**
- 8% of land area in Kansai vs All of Japan
- 16% of population in Kansai vs All of Japan
- 17% of electricity sales in Kansai vs All of Japan

**Kansai area vs All of Japan**
- 8% of land area
- 16% of population
- 17% of electricity sales

**Kansai Electric Generating Co., Ltd.**
- Land area: 8%
- Population: 16%
- Electricity sales: 17%
Kansai's Overseas Investment

- **San Roque Hydropower**: 345MW Dam type
- **Ming Jian Hydropower**: 17MW Run-of-the-River
- **Kuo Kuang CCGT**: 480MW CCGT
- **Senoko Power Co.**: 3,300MW Gas & Oil
- **Rojana CHP**: 267MW Gas Turbine

**Eastern Europe Environmental Fund**
Funding of the San Roque Multi-Purpose Project

Four Purposes of the Dam
1. Irrigation
2. Flood Control
3. Water Quality Enhancement
4. Power Generation

To enable dam-related functions, cost of dam was allocated and

Funded by Philippine Gov.

Funded by Private Sector
(BOT based IPP Project)

Public-private partnership project

200m height Rock-fill Dam reservoir capacity 990 million c.m.

Philippine Government

Allocated Dam Cost
(Backed-up by Japan Gov.)

Sponsor

Lenders

National Power Corporation
- Dam Owner
- Power Purchaser

San Roque Power Corporation
- Dam Operator
- Power Plant Owner

Equity

JBIC OIL
Thank you for your kind attention!

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Financing Sustainable Electrification

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San Cristobal-Galapagos Wind Project
The e8 San Cristobal-Galapagos Wind Project
Main features

- A 2.4 MW, first large-scale, wind project in the Galapagos Islands and Ecuador;
- A wind project built on a UNESCO World Heritage Site, which complements the United Nations Development Programme (UNDP) renewable energy program for the Galapagos Islands.
- One of the largest wind-diesel hybrid systems in the region, supplying an average of 50% of the island’s electric needs through wind power;
- Complemented by two (2) 6 KW Solar PV systems, solar PV technical training and energy efficiency educational programmes;
- Featuring a comprehensive programme for the protection and enhancement of an endangered indigenous bird species (The Galapagos Petrel).
- Registered under the Kyoto Protocol’s Clean Development Mechanism (CDM).
- Development and implementation managed by e8
Project Main Objectives

- Reduce the risk of oil spills in a highly vulnerable environment;
- Reduce atmospheric fossil-fuel emissions;
- Decrease San Cristobal's dependence on diesel fuel;
- Transfer technological expertise to local electric utility for the operation and maintenance of wind-based power system on a sustained basis;
- Provide a demonstration project model for the promotion and replication of small-scale power systems;
- Contribute to the protection of a unique ecosystem and World Heritage Site
- Increase access of the local population to renewable energy;
- Develop public awareness of effective demand-side management and energy conservation practices.
Project Timeline

- Concept: 1999
- Pre-Feasibility Study: 2001
- Feasibility Study: 2005
- Limited Notice to Proceed: 2005
- Full Notice to Proceed: 2006
- Implementation: 2006-2007
- Project Closeout: 2007
- Commissioning: Oct. 2007
- Inauguration: Mar. 2008
Specific topics

- Legal framework
- Financial structure
- Tariffs
- Subsidies
- Risk and liability mitigation
- Technology issues
- Logistical challenges
Legal and regulatory framework

- Energy and rural electrification policies were stable and clear. In spite of frequent turn over of main Government officers, agreements were fully respected.
- Regulatory framework was adequate.
- Rural Electrification Special Law, established a specific fund for supporting rural electrification programs.
- Project developers worked with success together with the National Electricity Council (CONELEC) in order to allow the use of rural electrification funds in renewable energy projects like the Galapagos.
- Ecuadorian Electricity Law determines preferred dispatching for electricity from renewable sources. Tariffs regulation establishes a preferred rate for renewable energy in the Galapagos Islands. Both factors were reflected in the PPA signed with Elecgalapagos, the local utility.
Financing the Project (1)

• In the 90’s, the Ecuadorian Government declared the need to promote renewable energy in the Galapagos Islands to replace diesel powered electricity generation.

• UNDP committed its support to the Ecuadorian Government to develop a program based on renewable energy for re-electrifying the Galapagos Islands.

• A Pre-feasibility report was issued in 2000 by UNDP consultants with identification of renewable resources in the 4 inhabited islands: San Cristobal, Santa Cruz, Isabela and Floreana. Estimated budgets were included.

• Ecuadorian Government and UNDP started to search at international level, potential donors/investors for the development of the Program.
Financing the Project (2)

- Based on previous experiences with UNDP, the e8 companies demonstrated interest in providing financial and technical support to develop the wind project in the San Cristobal island: first site visit was conducted by e8 delegates in November, 2001.

- The e8 companies committed their support, provided that the United Nations Foundation (UNF) also provides a complementary financial support.

- In April, 2003 a Project Document (ProDoc) was signed by the Government of Ecuador, the e8 companies, UNF and UNDP for the development of the Project. Funds from the e8 companies and UNF were provided as grants.

- A Commercial Trust was structured at the same time in order to administrate and manage the project funds. A private Ecuadorian experienced financial agency was designated as the Trustee.
Financing the Project (3)

• The Ecuadorian government contributed with financial resources from the Rural Electrification Fund (FERUM Fund). FERUM Fund rules were modified to permit financing of renewable energy projects.

• Through a Law in force at the time of Project implementation, it was possible to receive a percentage of income tax as voluntary donations from Ecuadorian taxpayers.

• Interests earned by funds were also a component of the financial structure.

• A small financial gap was filled with a short term loan provided with UNF funds through UNDP. Such funds had been provided by UNF for financing other renewable projects in other Galapagos islands.

• Total project cost was USD 10,5 million.

• In addition project development and environmental studies were totally funded and lead by charitable grant and technical expertise from e8 companies.
Financial structure

Financial structure (millions USD)

- UNF: $0.3; 3%
- FERUM: $3.3; 32%
- Tax payers: $0.4; 4%
- Loan: $0.6; 6%
- Interests: $0.3; 3%
- e8: $5.5; 52%

Legend:
- e8
- UNF
- FERUM
- Tax payers
- Loan
- Interests
Tariffs (1)

- The Ecuadorian Electricity Council (CONELEC) - the electricity regulator - has established specific tariffs for renewable energies in Ecuador.
- For the Galapagos Islands there are special preferential rates, although still not adequate, as explained below.
- The tariff value determined for wind energy is US$ 0.1282 / kWh for the San Cristobal – Galapagos Wind Project.
- Above value was fixed by CONELEC after a detailed cost analysis in accordance with the agency criteria based on costs for grid integrated systems. Although the Project developers demonstrated that such prices are insufficient to cover capital and O&M costs for the San Cristobal project, the regulator did not consider the rationale behind such explanation.
Tariffs (2)

- Because of such price restriction, the current tariff covers only O&M costs as well as other obligations of the Trust (fund for petrel protection program, emergency maintenance fund, demobilization fund, seed fund for future re-equipment)
- A PPA has been signed between EOLICSA (the IPP - San Cristobal Wind Project company) and “Elecgalapagos” the local Government Utility, responsible for electricity distribution in the Galapagos
- As mentioned, PPA is based on a rate of US$ 0.1282 / kWh for wind energy delivered to Elecgalapagos, while diesel generated electricity costs approximately US$ 0.17 / kWh to the local utility, based on subsidized fuel delivered at less than 1 USD per gallon (US$ 0.26 / litre).
- Tariffs to final users are regulated by the Ecuadorian Electricity Council (CONELEC)
Subsidies

- Average tariff to final users is US$ 0.09 / kWh, while actual cost to the utility is roughly US$ 0.19 / kWh, including wind component. The difference is being subsided by the Government.
- Diesel fuel for electricity generators is also subsided by the Ecuadorian Government.
- Above situation is common for all distribution companies (Government owned) in Ecuador.
- The Rural Electrification Special Law, established an specific fund coming from monthly contributions of industrial and commercial electricity users (10% of electricity invoices) in order to support rural electrification programs.
- An important component (32%) of the San Cristobal Wind Project was financed as a subsidy with rural electrification funds; i.e. the national subsidy to diesel generation was re-directed to wind generation.
- PPA tariff is not enough to recover investment costs: financial structure was mainly based on international and national grants (subsidy to capital costs).
Risk and liability mitigation (1)

• e8 liability with respect to the Project was mitigated/eliminated by means of its participation through a Trust scheme: it legally shields the settlers liability

• The implementation approach of a Limited Notice to Proceed (LNTP) phase, followed by a Full Notice to Proceed (FNTP) phase was effective for mitigation of financial risk

• e8 funds were not transferred to the Project until other funds were transferred

• The risk concerning estimation of capital cost was mitigated through the determination of fixed price proposals prior to Project implementation

• The risk of miss evaluation of O&M costs was mitigated through thoroughly investigations and estimations of actual local costs and imported goods and services

• Technical risk was mitigated by utilizing the e8 Network of Expertise to provide management and technical support, as well as, well experienced Project Director team and Local Management
Risk and liability mitigation (2)

- Risk of misestimation of wind resource was mitigated through the installation of an additional 50-meter measuring system on the project site, before project implementation (previously two 20 meters masts were installed for 2 years for collecting wind data). Hybrid system diesel displacement was reduced from originally estimated 61% to 52%.

- Risk from multi-contract approach was mitigated through increased effort by project management.

- Risk to affect the endangered petrel in the project area was mitigated through: relocation of project site, stringent Environmental Management Plan, location of funds for petrel program, high level Supervision Committee.

- Instability of the Ecuadorian public administration during past periods created frequent changes in key government appointments. It was mitigated though the signature of step-by-step agreements, including PPA, well respected by involved public agencies.
Risk and liability mitigation (3)

- To avoid to politicize the Project, the e8 maintained leadership in the Trustee Committee. Risk was mitigated through stream-lined project management with pre-assigned authorization limits and provision for electronic approval of major project management decisions by the Trust Committee.

- Risk of future changes of electricity sector regulations is mitigated through terms and conditions of signed PPA.

- In-country Local Manager activity was very important in keeping the project on course and facilitating discussions with government agencies and local stakeholders during period of high-turnover in government agencies.
Technological issues

• The wind-diesel hybrid system in operation is an state-of-the-art-system regarding operational philosophy

• Risk of operative problems has been mitigated by means of an O&M Contract signed with the manufacturer for 2-years duration (the same as the guarantee period)

• Through O&M Contract the manufacturer provides on site full-time engineer and remote permanent supervision through internet from the manufacturer headquarters in Spain

• Risk mitigation is also provided through highly experienced Operations Manager duly trained at the manufacturer facilities

• In addition, a permanent on site HCB plan to local operators is in process by Operations Manager and manufacturer’s engineer, in order to minimize operational risk

• The e8 companies permanent supervision is an additional and highly important support to mitigate technological risks
Logistical Challenges
Summary: Innovative Aspects and Challenges

- **INNOVATION**: IPP Model-Funding from multiple sources.
  **CHALLENGE**: Multiple accounts and reporting, cash flow difficulty.

- **INNOVATION**: Environmental protection special programmes.
  **CHALLENGE**: Additional responsibility, coordination and adapted timelines.

- **INNOVATION**: Strong involvement of local partner, EEPG, provided many benefits - Generating Concession, FERUM Subsidies, Local Designated Income Tax Payments, and Land Easement.
  **CHALLENGE**: Addressing local capacity issues and local staff availability to work on new projects.

- **INNOVATION**: Commercial Trust Legal structure
  **CHALLENGE**: Additional management efforts.

→ Public–Private Partnership model with strong project management, strong support within Ecuador and from UNDP were key to addressing the many unique challenges of the San Cristobal Wind Project.
Project First Results and Success
Operation results

- Operation started October 2007
- 2008 was an unusual “low wind” year
- 2009 wind conditions are becoming normal
- Next slide shows wind vs. diesel energy production for the whole operation period
Financial Achievements

- 100% of invoices for energy delivered to local utility have been paid on time
- Incomes from energy sales are sufficient for putting aside funds for long term replacement / major repairs, as well as for petrel protection program
- Annual operation budgets have been kept below original foreseen values
- Short term loans being paid on time
Environmental Achievements

- Fossil fuel reduction: 1,375,000 litres of diesel imported for the period October 2007 – March 2009
- CO2 Emissions avoided: 3,200 tons avoided during the same period
- Petrel protection and enhancement programme: very positive results for the period October 2007 – March 2009
Project Team

- Paul Loeffelman: American Electric Power (AEP) – Project Leader
- Jim Tolan: Industry and Energy Associates (IEA) – Project Director
- Luis C. Vintimilla: Ecuadorian Independent Consultant - Project Manager
THANK YOU

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Tel/Fax: +593-2-354 0161
Pro-Poor Public-Private Partnership to Enhance Energy Service to Rural Households

-- A Micro Hydro Project in Cinta Mekar, Indonesia
Presentation Structure

- Lighting up lives - Video
- Main achievements and stakeholders
- Assessment and Challenge
Layout of the Micro Hydro Power Plant in Cinta Mekar
Two sub-components

- **Demonstration project**: A cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocations of resources, risks and rewards

- **Capacity building**: Assistance to the Government in establishing a mechanism for mobilizing and allocating financial resources for rural electrification projects accessible to, among others, public-private partnership projects
Main Impacts

- Income generation of the target community to support
  - Electricity supplies to poor households
  - Social development (health, education, sanitation, etc.) and environmental benefit
  - Seed funds for off-farm economic activities for alternative or additional income generation
Accomplishments & Results

• Sustainable development, focusing on poverty reduction
• A partnership joint venture to develop, operate and maintain a mini-hydro power plant
• A sustained source of income to the target community
• A social development plan in place to be implemented
• Improved village infrastructure
• Improved standard of living of the poor through enhanced income and access to electricity and social services
# Community

<table>
<thead>
<tr>
<th>ROLES</th>
<th>INCENTIVES</th>
</tr>
</thead>
</table>
| • Mobilize itself into a self-functioning legal entity to form the joint venture  
  • Mobilize in-kind support, including village workforce in the project development, operation and maintenance  
  • Prepare and implement a social development plan  
  • Maintain the cash flow in partnership with the private investor  
  • Support health, education and other social benefits to the poor  
  • Develop a mechanism for administering and sustaining the seed funds  
  • Monitor and assess the implementation of the project | • Self-mobilization as a functional entity  
 • Access to technical and financial support to transform itself into an entrepreneur  
 • A source of income to improve the standard of living of the poor  
 • Social infrastructure development and funds for additional and/or alternative income generation |

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[Image: Logos of UNESCAP and GEF]
Government

**ROLES**

- Provide overall policy support and guidance to the project and related activities
- Participate in the Steering Committee of the project
- Advise on the implementation of the social development plan
- Take actions towards developing institutional and policy framework to sustain partnership projects

**INCENTIVES**

- Promotion of rural electrification through a partnership project model
- A model for possible replication in other potential projects
- A financing option for investment in rural electrification
- Community support and contribution to social development
**ROLES**

- Provide overall guidance to the project implementation
- Provide technical and limited financial support to the project preparation and development
- Assist the Community in developing a social development plan
- Package and disseminate the results and lessons learned from the model inside the country and outside for possible replication
- Assist the Government in capacity building towards the formation of a sustained institutional mechanism for financing PPP projects

**INCENTIVES**

- A tested model for policy support and replication
- Contribution towards raising income to support access to electricity and access to social benefit and funds for income generation (WSSD Plan)
- A success story of technical cooperation on public-private partnership to benefit the poor
The 5P Market Segmentation Models

- **Profit oriented**
- **Commercial**
- **Hybrid**
- **Non commercial**
- **Grants**

- **Cost recovery**
- **Empowerment**

- **“Business as usual”**
  - Market driven tariffs

- **“Public-Private Partnership”**
  - Community participation
  - Awareness and education
  - Selling power to grid
  - Social development

- **“Social-Project Driven”**
  - Project oriented
  - Neglecting tariff and power purchase
Project Parameters (I)

• Ownership: Community 50%  
  Private 50%

• General Condition: 122 out of 640 families have no access to electricity

• Development Cost: US$ 169,000: Community’s equity US$75,000 (sponsored by project)

• Installed Capacity: 120 kilowatt (2 x 60 kW)

• Tariff (PPA in 2004): Rp 420 / kwh (5.12 cents/kwh)

• Revenue: Rp 30,240,000/m (US$ 3,688)
## Project Parameters (II)

- **O& M Cost:** Rp 4,000,000/m (US$ 500)
- **Income:** Rp 26,240,000/m (US$ 3,200)
- **Reserves to Joint venture:** Rp 6,000,000/m (US$ 750) (MM/5y)
- **Net Income:** Rp 20,240,000/m (US $ 2,468)
- **Share of Community & private:** Rp 10,120,000/m (US $ 1,234)
- **VAT / Income Tax:** 10%
- **Simple Payback Period:** 10 years
- **Operation Period:** 20 years
Update (I)

• There was a cooperative meeting once a year to discuss how to use the revenue properly.

• By 2007, 156 households were electrified, the expense of the revenue have been adjusted.
  – Electricity connection to the poor 0%
  – Education 9.5%
  – Healthcare Service 5%
  – Income Generating Activities 60%
  – Infrastructure 6%
  – Cooperative Operational 16%
  – Village Operational 3.5%

• In 2008 there are some changes on the fund allocation by increasing the distribution to support Healthcare Service (8%) and reduce the share of Infrastructure (3%), the other allocations remain the same as 2007
Update (II)

The total money expense up to now on each allocation are:

- The electricity connection: U$ 8,500 Rp. 85,200,000 (156 households)
- Education : U$ 1,502 Rp.15,120,000 (260 persons)
- healthcare : US 1,180 Rp. 11,780,000
- Income generating Activities: U$ 3,600 Rp. 36,000,000
- Infrastructure : U$ 760 Rp. 7,600,000
- Village Operational : U$ 390 Rp. 3,928,000
- Cooperative Operational : US 1,370 Rp. 13,676,000
The Indonesian Energy Minister And Dutch Ambassador To Indonesia at the Power House.
Main lessons learned

• Stakeholders consultation - roles and expectations among the various stakeholders
• Importance of community ownership
• The need for good governance at the local level
• The need for a champion to promote the cause
• Address gender issues throughout the process
Capacity Building

- Activities towards the Establishment of Financing Institutional Mechanism: Advisory services, exchange visits, round table, policy report

Roundtable Discussion

Indonesian Delegation’s visit to India
Challenges

• Strengthening systems in place to “consolidate” achievements
• Advocacy work to change the policy framework of selected countries
• Extensive dissemination detailed process documentations
• Facilitating a regional process to improve the preparedness of countries for 5P
Overall assessment of achievements

- Stakeholder empowerment
- Governments taking serious notice and high potential for policy changes
- Communities & governments commit resources on agreed basis
- Strong private sector participation
Overall assessment of achievements (Cont’d)

- Established synergies among project components create high impact
- Good 5P Practices in the Region
- Regional networking critical for disseminating good practices
THANKS

HongPeng Liu
Energy Security Section
Environment and Development Division
United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)
Tel: +66 22881543
Email: liu4@un.org
Introducing
GE Energy Financial Services
GE: Where Energy Financial Services fits

Energy Infrastructure
Technology Infrastructure
GE Capital
NBC Universal

Energy Financial Services
Commercial Finance
Aviation Financial Services
GE Money
Treasury
GE Energy Financial Services (EFS)

Global equity investor and project finance lender for the energy industry

- EFS’s 25+ Years in Energy Finance
- GE’s 100+ Years in Energy
- Typical Investment Size: $15MM - $125 MM
- US$22 Bn. Assets
- 22 GW Portfolio
- Singapore office opened in Jan 2008 for SE & E Asia
- Greenfield & Operating Assets
- Expertise in Renewable Energy

imagination at work
GE EFS Renewable Energy Portfolio

$4 Billion Renewable Energy Portfolio

- Wind 79%
- Solar 5%
- Biomass 4%
- Geothermal 1%
- Biofuels 3%
- Venture Capital 1%

7,000+ MW

- Investments across renewable sectors
- Equity, preferred equity, venture capital and project finance
- Diverse portfolio of turbine providers, regulatory regimes, and financial structures
- Large-scale projects in solar PV and hydropower
- In Dec. 2008, Renewable Energy Trust Asia (RETA) established to invest in SE Asia & India with Epuron
Perspectives on risk and opportunities for renewable power in Asia
The Asia renewables opportunity
2005-2020 growth outlook* (non-hydro)

* Includes non-commercial renewable fuels
Source: Institute of Energy Economics of Japan (2007 forecast, basecase);

- Thailand • Biomass • Biogas • Wind
- Vietnam • Biomass • Biogas • Wind
- Malaysia • Biomass • Biogas
- South Korea • Wind • Solar
- Japan • Wind • Solar
- Taiwan • Wind • Solar
- Philippines • Biomass • Biogas • Geothermal • Wind
- Indonesia • Biomass • Biogas • Geothermal

2005
2020*
Renewables policy design: general observations

• Investment incentives, especially price-based mechanisms, typically have binary outcomes: either they are attractive enough to drive investment, or not

• Renewables schemes should be part of a larger vision, regulatory framework, and planning approach for the energy sector

• Policies function best when they
  
  ✓ address both economic barriers (returns) and non-economic barriers (e.g., obstacles to grid access, poor power market design, lack of information and training, social acceptance issues)
  
  ✓ are predictable and transparent in order to attract investments
  
  ✓ incorporate transitional incentives, where necessary, to move technologies towards market competitiveness
  
  ✓ are tailored to specific technologies
  
  ✓ take into account the potential impact of large-scale penetration of renewables on the entire energy system
## Renewable energy incentives in Southeast Asia

<table>
<thead>
<tr>
<th>Incentive Type</th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Philippines</th>
<th>Thailand</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff adders / feed-in tariffs</td>
<td></td>
<td>**</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewable Portfolio Standard, offtake guarantees</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓*</td>
</tr>
<tr>
<td>Capital subsidies, grants, or rebates</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Investment or other tax credits</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Sales tax, energy tax, or VAT reduction</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tradable renewable energy certificates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public loans or financing</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Biofuels mandates (non-power)

**Pending enactment of FITs.

Source: [Renewable Energy Policy Network for the 21st Century](#)
Conclusions

• Most renewable energy more costly to build per MW than conventional power plants

• Policy incentives critical to attracting private investment to the renewable energy sector

• Predictable long-term tariffs via PPAs best option

• Grid access and upgrading transmission infrastructure also important

• Investment credits and tax holidays also useful
Contact:
James Berner
GE
Energy Financial Services

240 Tanjong Pagar Rd.
#05-00 GE Tower
Singapore 088540
Phone: +65 6326 3478

Email: james.berner@ge.com
www.geenergyfinancialservices.com
Technology Provider Perspective

Michael Trivett
Business Development Manager – Asia
Technology Provider Perspective

• **B&W focuses on**
  – Countries with load growth and active projects where we have a product/service match
    • New Clean Coal fired power projects
    • New Bioenergy, Solar and other Renewables
    • Installed fleet for aftermarket parts, services and upgrades

• **B&W investments include**
  – Joint Venture design/manufacturing operations
  – Subsidiary companies for OEM, parts & services
  – Supplier of boiler and air quality control equipment
  – Network of Sales Representative offices
  – Licensees
Clean Energy Technology

- Advanced Ultra-Supercritical
  - New designs, materials

- Oxy-Combustion
  - 150 MWe demo with US DOE

- Advanced Energy
  - Solar & Bioenergy solutions

- Advanced Environmental
  - Catalyst systems demo

- CO₂ Scrubbing
  - RSAT Pilot plant
Clean Coal Technology - Costs

Cost of Electricity, Percent of Base SCPC*

- SCPC: Supercritical Pulverized Coal
- MEA: Avail.
- KS1: Demo
- IGCC: Demo
- Oxy-S: Demo
- Oxy-U: Advanced Demo
- Wild Card

Various "Wild Card" Technologies

* SCPC = Supercritical Pulverized Coal; Data obtained from various sources.
Technology Provider Perspective

- **B&W investment evaluation criteria**
  - Is the country politically stable?
  - Is there an Energy Policy and Energy Plan?
    - With a defined forecast and implementation schedule?
    - Does it promote or exclude coal power?
    - Are there incentives for Clean Coal projects?
  - Does the market capacity and demand warrant investing in a dedicated operation?
  - For an IPP, will it actually get built?
    - Does the developer have the experience?
    - Is there a PPA with an acceptable tariff and terms?
    - Is the project bankable and can the developer arrange financing?
Technology Provider Perspective

**Investment obstacles**

- Project delays or cancellation due to policy changes
- Tax implications – onshore/offshore exposure
- Legal structure for intellectual property and contract protection
- Import/Export taxes on raw materials and products
- Ease or difficulty in Customs procedures
- Country specific issues:
  - Strong environmental lobby against new developments
  - Substantial domestic manufacturing content requirements
  - Restrictions on importation of goods manufactured in China
Thank you

Contact Information:
Email: mgtrivett@babcock.com
Tel: +1 330 208 7792

www.babcock.com
Risks of Clean Tech Investments in South-East Asia

Peter Greenwood
Executive Director - Strategy
CLP Holdings
Technical Risks

• Limited level of clean tech deployment in Southeast Asia (other than hydro)
• Emerging and evolving clean tech lack track record
• Energy infrastructure not equipped for high penetration of clean technologies
• Adaptation of clean tech to local conditions for Southeast Asia
• Intellectual Property (IP) risks - technology companies may be selective in term of markets
Economic Risks: Clean Tech is Expensive

Clean Energy is seriously out of the money – and seriously out of the market

Notes:
NGCC = Natural Gas Combined-Cycle

Levelised Cost of Electricity (USD / MWh)
...and the Major Costs are Upfront

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200MW CO$_2$ mineralisation</td>
<td>~580M</td>
</tr>
<tr>
<td>CO$_2$ storage tenement</td>
<td>~200M-370M</td>
</tr>
<tr>
<td>500MW IGCC</td>
<td>~1.5B</td>
</tr>
<tr>
<td>99MW windfarm</td>
<td>~120M</td>
</tr>
</tbody>
</table>

There are no small (worthwhile) bets in advanced clean technology.
Economic Risks: CER Revenue Uncertainty

- Volatility of CER prices
- Uncertainty in CERs generated due to resource and energy production variability (e.g. wind power)

Average, Maximum and Minimum Values of Monthly Capacity Factors, Germany, 1990-2003, Showing the Long-Term Pattern of Wind Power Variability

Source: Point Carbon website, *Secondary CER OTC Assessment*, 14-August-2009
Regulatory Risks

- Stable and consistent clean tech policies and incentives are yet to be developed in some countries.
- Uncertainty and volatility of regulations hinder investment and deployment.

NB:
- The target for Vietnam is an aspirational target, i.e. one which has not yet been passed into law.
- Philippines does not have a % renewable energy target, but has installed capacity targets for different types of renewable energy.
- Hong Kong, Indonesia, Vietnam, and Philippines do not offer feed-in tariffs for renewable generation at present.
Regulatory Risks

Even within national markets, state or provincial regulation can become the major driver (or risk) to growth

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamil Nadu</td>
<td>807</td>
<td>47</td>
<td>133</td>
<td>355</td>
<td>688</td>
<td>861</td>
<td>565</td>
<td>392</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>198</td>
<td>197</td>
<td>2</td>
<td>6</td>
<td>49</td>
<td>545</td>
<td>484</td>
<td>276</td>
</tr>
<tr>
<td>Gujarat</td>
<td>165</td>
<td>9</td>
<td>7</td>
<td>29</td>
<td>51</td>
<td>85</td>
<td>329</td>
<td>580</td>
</tr>
<tr>
<td>Karnataka</td>
<td>51</td>
<td>23</td>
<td>52</td>
<td>81</td>
<td>200</td>
<td>171</td>
<td>265</td>
<td>187</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>9</td>
<td>8</td>
<td>44</td>
<td>130</td>
<td>94</td>
<td>75</td>
<td>112</td>
<td>70</td>
</tr>
</tbody>
</table>
Environmental Risks

- Long-term environmental impacts of unproven technologies are not clear
  - E.g: Potential CO₂ leakage from geological storage (CCS)
- Renewable energy resources are vulnerable to climate change impact
Project Risks

- New, start-up technology vendors may not be able to honour commitments until product life (e.g. out of business before end of performance guarantee)
- Small markets may only afford or accept projects below critical mass, rendering less competitive cost structures (e.g. high overheads, limited choice of supplier/partner)
- Off-taker may have financial difficulties to pay dues
- Small clean tech projects in small markets are price takers and vulnerable to changes in major markets
Advanced Technology Deployment
Risk Hurdles

- Project
- Environmental
- Regulatory
- Economic
- Technical
Contact Information:
Email: pwgreenwood@clp.com.hk
      priscillalee@clp.com.hk

Tel: +852-2678-8182
Fax: +852-2678-8333

Website: www.clpgroup.com
DEPLOYMENT OF ADVANCED CLEAN POWER TECHNOLOGIES

James Gordon Cumming, Region Vice President-Asia
Alstom Asia Pacific Sdn Bhd
Installed base growth in Asia has major challenges

Installed base by 2030 in GW (IEA)

- Asia
- MEA
- Americas
- Europe

2 Environmental challenges

- Traditional pollutants
- Climate Change

Installed base increase until 2030 in Asia must be sustained by Clean Power solutions
Clean Power solutions exists

Current technology makes coal clean
Future technology will achieve zero emission or lower…!
Clean Power within Alstom

- Air Quality Control Systems (new and existing plants)
  - De-SOx, De-NOx, ESP, Fabric Filters, Mercury control

- Production efficiency increase
  - Fuel Preparation/Retrofit
  - New generation plants
  - Energy management

- Technology mix
  - Renewables
  - Nuclear

- Carbon Capture and Storage
  - Capture-ready
  - Capture-effective

Alstom has the complete portfolio for Clean Power
Conclusions

• Increase of Asian power generation installed base must be sustained by Clean Power solutions

• Already existing Clean Power solutions provides key opportunities to address two key challenges for the Power sector: provide cleaner electricity
  – Decrease emissions of SOx, NOx, Particulate, Mercury…and CO2 today
  – Prepare future CCS (Capture-ready)

• Adapted and clear regulations along with supportive financing conditions must be provided to ease the implementation of these solutions

Alstom is fully committed to provide solutions for Clean Power production
Today we provide the cleanest air solutions

- for new plants
- for the installed base
Contact Information:
Email: gordon.cumming@power.alstom.com
Tel: +603-20556000
Fax: +603-20556049

Website: www.alstom.com
ADB’s Climate Change Financing Program: Clean Energy and Increasing Access to Energy

Financing Sustainable Electrification
South and South-East Asia Dialogues
e8 - GEF - UNDESA - UNESCAP
8 - 10 September 2009
Bangkok, Thailand

Anil Terway
Senior Advisor and Practice Leader (Energy)
Regional & Sustainable Development Department
Asian Development Bank
Key Issues in Changing Context

- **Energy Security**
  - Asia needs energy to power its economic growth
  - Increased import dependency
  - Volatility in energy prices

- **Climate Change**
  - Two-third of GHG emissions come from energy sector
  - Developing Asia’s share in global GHG emissions is projected to grow
  - High initial cost and availability of low carbon technologies

- **Access to Energy**
  - Access to energy is essential to meet MDG targets
  - About 900 million people in Asia still without access to electricity
  - Many good models that need to be replicated and scaled up
Developing Asia’s Share in Energy-Related CO₂ Emissions

WEO 2008 Reference Scenario

<table>
<thead>
<tr>
<th>Year</th>
<th>Total CO₂ (Gt)</th>
<th>Share (%)</th>
<th>Per Capita CO₂ (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>27.89</td>
<td>30%</td>
<td>2.4</td>
</tr>
<tr>
<td>2030</td>
<td>40.55</td>
<td>43%</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Source: ADB, data from IEA World Energy Outlook 2008
ADB’s Climate Change Program
ADB’s Strategy 2020


- Inclusive Economic Growth
- Regional Integration
- Environmentally sustainable growth
  - Includes climate change
  - Scale up support for mitigation and adaptation
ADB’s 2009 Energy Policy

- Greater focus on energy security and transition to low carbon economy

- Three pillars:
  - Promoting energy efficiency and renewable energy
  - Maximizing access to energy for all
  - Promoting energy sector reform, capacity building, and governance

- Support sustainable rural electrification efforts of DMCs (energy for all)

- Annual lending target of $2 billion for clean energy from 2013
Key Initiatives on Climate Change Mitigation

- **Low-Carbon Energy Options**
  - Energy Efficiency Initiative
  - Carbon Market Initiative
  - Sustainable Transport Initiative
  - Energy for All Initiative
  - Cities Development Initiative for Asia

- **Efficient Transport Systems**
  - Energy Efficiency Initiative
  - Carbon Market Initiative
  - Sustainable Transport Initiative

- **Improved Urban Sanitation and Reduction of Fugitive Methane Emissions**
  - Carbon Market Initiative
  - Energy for All Initiative
  - Cities Development Initiative for Asia

- **Sustainable Land Use and Forestry**
  - Sustainable Transport Initiative
  - Cities Development Initiative for Asia
  - Reduced Emissions from Deforestation and Land Degradation
Financing Thrust: Mitigation

Competitive and affordable climate change mitigation actions by:

- Accessing concessional resources
- Catalyzing private sector capital
- Using market-based mechanisms (e.g. carbon and insurance markets)
Accessing Concessional Resources
# Mitigation-Related Funds

## INTERNAL at ADB

<table>
<thead>
<tr>
<th>Clean Energy Financing Partnership Facility ($95 m)</th>
<th>Carbon Market Initiative Funds:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Asia-Pacific Carbon Fund ($151 m)</td>
</tr>
<tr>
<td></td>
<td>- Future Carbon Fund (target $100 m)</td>
</tr>
<tr>
<td></td>
<td>Climate Change Fund ($40 m)</td>
</tr>
</tbody>
</table>

## EXTERNAL

<table>
<thead>
<tr>
<th>GEF Climate Change Focal Area ($250 m/ year)</th>
<th>Clean Technology Fund of the Climate Investment Funds (WB as Trustee) (target $5 b)</th>
<th>Strategic Climate Fund of the Climate Investment Funds (WB Trustee) Target:</th>
</tr>
</thead>
</table>
Clean Energy Financing Partnership Facility (CEFPF)

- Grants and concessional finance for
  - Deployment of pre-commercial clean energy technologies
  - Lowering barriers for use of clean energy technologies, e.g. bundled smaller CE projects
  - Increase access to clean energy
  - Capacity building programs for clean energy

- Target: $250m, open to further contributions
Climate Change Fund (CCF)

- ADB’s commitment in 2008: $40m
  - $25 m for clean energy
  - $5 m for sustainable land use; and
  - $10 m for adaptation

- Open for contributions
Catalyzing Private Capital
Private Sector Operations

- **Direct Financing of Private Sector Projects**
  - Wind energy in India ($45 m); biomass in Thailand ($77 m); district energy infrastructure in PRC ($400 m); energy efficiency in PRC (partial credit guarantee, $107 m)

- **Investments in Clean Energy Equity Funds**
  - $20 m seed capital each for five private equity funds: MAP Clean Energy Fund (South Asia, Indonesia); China Environment Fund III; South Asia Clean Energy Fund; Asia Clean Energy Fund, and China Clean Energy Capital
  - Seed Capital Assistance Facility (SCAF) for clean energy; joint undertaking with UNEP; fully funded by GEF
Using Market Mechanisms: The Carbon Market
Unique Model: Project Cash Flow into Financing

ADB Modality

Project Financing

$/€

Tech Asst

Carbon Credits

Project phase:

Development

Commercial Operation

Year: 0 1 2 3 4 5 6 7 8

Standard “Pay-on-Delivery”

$/€

Carbon Credits

Project Cash Flow
ADB’s Future Carbon Fund

- Purchase of post-2012 carbon credits from projects approved now
- Available to projects receiving ADB financial support and CDM-specific technical assistance
- Associated costs and risks are lowered through “piggy back” design and strategy
  - Economic, technical, financial and legal due diligence carried out by ADB main operations
- Fund became operational on 30 January 2009; open for more participation
Sample Project Credit Flow

Carbon Credit Volume

Year: 2007  08  09  10  11  12  13  14  15  16  17  18  19  20

Asia Pacific Carbon Fund
Credit Marketing Facility
Future Carbon Fund
Credit Marketing Facility

Loan Inception
Project Completion

End of Kyoto Commitments
Many buyers
Few buyers

Emission reduction portfolio (10-year period)
Energy for All
Energy for All Initiative

- $2.3 m TA from the Netherlands government:
  - Providing access to energy
  - Developing and demonstrating new approaches and methodologies
  - Strengthening ADB’s institutional capacity

- Two pillars of strategy
  - Identifying, designing and implementing access to energy projects; knowledge management
  - Establishing energy for all partnership to demonstrate and scale up workable approaches and methodologies

- Getting involved in energy for all partnership
Energy for All Partnership
Providing access to energy to 100 million people by 2015

- Replicable and scalable projects
- Innovative financing
- Private sector participation
- Networking and knowledge sharing
- New approaches and methodologies

Steering Committee (10 members)
ADB, E+Co, e8, NEA Philippines, REEEP, ReEx Capital Asia, SNV, SEAS, TERI, WBCSD

6 Working Groups as of now:
- Biogas: SNV
- Solar Lanterns: TERI
- LP Gas: WLPGA
- Enterprise Dev’t: GVEP
- Financing: E+Co
- Pacific: REEEP

(Working Group Chairs)

Secretariat
ADB’s Country Risk Assessments
Asia Regional Integration Center

- ADB launched the ARIC on 2 October 2006
- Knowledge and information portal on regional cooperation and integration in Asia and the Pacific
- Includes the Integration Indicators Database, a user-friendly and flexible statistical tool; the FTA Database, the only online database that tracks free trade agreements in Asia and the Pacific; Asian Macroeconomic Developments, economic and financial data, economic reports, policy researches; the Asian Economic Monitor, a semiannual review and outlook on growth and development in emerging East Asia.

http://aric.adb.org/aboutus.php
Asian Bonds on Line

- ABMI is an ASEAN+3 initiative
- Supported by ADB and the Government of Japan
- AsianBondsOnline is a one-stop clearinghouse of information on sovereign and corporate bonds
- Gives market participants and potential investors a clear perspective of the current market; details of government and private sector initiatives to enhance market depth and liquidity

http://asianbondsonline.adb.org/
Thank you!!!

Anil Terway
aterway@adb.org
+632 632 5312
Sharmila Barathan
South Asia Energy Policy
GE Energy Infrastructure

Financing Sustainable Electrification
South and South-East Asia Dialogues
8-10 September 2009, Bangkok, Thailand
## Energy Policy Opportunities

**India**

- **RENEWABLES**
  - Increase in State Feed-In-Tariff
  - Extension of Generation Based Incentive
  - Expand RPO
  - RE Certificates & Trading regime

- **NATURAL GAS**
  - Priority allocation of gas to power sector
  - Policy incentives for distributed generation

**Bangladesh**

- **RENEWABLES & NATURAL GAS**
  - Efficient use of natural gas combined cycle & advanced GTs
  - Gas based small power program
  - Policy options for Biomass/Urban waste
“Update on Pan Asian Energy Development”

A Presentation from
Independent Power Producers Forum (IPPF)
At e8-GEF-UNDESA-UNESCAP
“ Financing Sustainable Electrification”

South & South-East Asia Dialogues
Bangkok, Thailand, September 8-10, 2009

By
Joel B. Laykin
Secretary General
IPP’s a definition

- Brief History

- IPPF’s Role – How it all came about.
Our Members - 1

- Aggreko
- Aon
- AEI Asia Ltd
- Asian Power Solutions
- Black & Veatch
- Caterpillar Asia
- Chevron International
- City Power
- CLP Power
- CRA International
- Cormetech Inc.
- Diaz, Reus, Rolff & Targ
Our Members - 2

- DLA Piper
- EESCO P2E2 HK
- Emerson Process
- ExxonMobil Energy
- Gibson, Dunn & Crutcher
- Golden Concord
- Indra Systems
- Laykin Communications
- Litamos International
- Marsh
- Marubeni Asia
- Mayer Brown JSM
- Nemron Energy
- O’Melveny & Myers
Our Members - 3

- PB Power
- PennWell Inc
- PetroVietnam
- Pinsent Masons
- PUFFA Ltd
- RSW Inc.
- Solvina International
- R.W. Beck Int’l
- Simmons & Simmons
- Vista International
- WestLB AG
- Worley Parsons
“Update on Pan Asian Energy Development”

Presentation
at e8-GEF_UNDESA-UNESCAP
Financing Sustainable Electrification
South & South-East Asia Dialogues
Bangkok, Thailand
September 8th – 10th, 2009
1. Energy Values…The Challenge (Basic Questions)

- How to change the behavior of seven billion people?
- How to deliver the “good life” without ending life on this planet?
- How to turn “Being Green” into being profitable
2. Redefining GHG

- CDM vrs APP plus Kyoto plus Bali, plus COP-15
- Who’s trading what and where?
- “Carbon” as the New International Currency
3. The ABCD’s of Energy

A. Supply of Energy
B. Demand for Energy
C. Sources of Fuels
D. Uses of Fuels
4. Changing Concerns
– Some Solutions from East Asia

- Metropolitan Asia leads the way with the convergence of capital, technology and official commitment
- Hong Kong, Singapore and (supposedly) Shanghai are key facilitators for every possible element, company, sector in the power generation industry in Asia (?)
- Fuel supplies, transportation, improved regulators
5. Marketplace Sophistication

- Negatives – the UNOCAL Debacle
- Positives - Future Gen
  - PRC’s economy of scale
6. The “Gold Rush” - 1

- Fools rush in where angels fear to tread
- Over eighty companies
- Western “model” didn’t work. PRC simply wasn’t ready ….. ..or willing
- Divide and conquer
7. The “Gold Rush” - 2

- The exodus float out on a sea of red-ink and “Rome is burning back home”

- Exceptions to the rule, a select few “stay the course”

- “Last man standing”------ Colin Tam (Nov, 2004)
8. Because ...it’s there!

- Why why why why do they do it?
- If you are a global player with no substantial presence in Asia by 2020, you are not a global player any more.
9. Some Interesting Quotes - 1

- “Stateside power companies dare not look overseas because the analysts will punish them”……John Easton (Mar 2004)

- “And, why should they? There is so much low-hanging fruit to keep them busy in the USA”……Bill Ruccius (Dec 2007)
10. Some More Interesting Quotes

- Expectation – “Everyone thought that the repeal of “PUHCA” would unleash a new tidal wave of power investment into Asia”……Thomas Bispham (Jun 2008)

- Predictions – Perhaps in a generation, the big U.S. investors, might return ……Robert Bestani (Feb 2006)
11. The PUHCA Paradox

- 1935-2005, seventy years of commercial handcuffs
- A good thing in 1935
- A bad thing by 1985
12. The PUHCA Paradox - 2

- Long delayed M & A “feeding frenzy…..in slow motion

- Prediction – “Within a decade, the approx 200 U.S. IPPs will be reduced to about 60-70 with a half dozen 1200 lbs Gorillas ready to grow overseas”…..Joel Laykin (Mar 2008)
13. The Asian Way

- China and India reach out, HK, Singapore, KL, BKK, Tokyo and the Gulf reach in

- The 1200 lbs gorillas will have to frolic in Africa or South America

- Asian players snapping up low and middle – hanging fruit
14. Some more Over-Arching Issues and Quotes

- “The most important bilateral relationship in the world relationship in the world today is that of the USA and the PRC”......Secretary James Baker III (Sept 2007)

- “Energy security is the only thing people really do something about”......Bill Overholt (Oct 2009)
Thank You!

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