Overcoming Energy Efficiency Financing Barriers in the ASEAN Region

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ENERGY EFFICIENCY POLICIES IN THE ASEAN REGION

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Presentation Outline

- Introduction
- Financing Barriers
- Financing Mechanisms
  - Energy Efficiency Funds
  - Utility Financing
  - Dedicated Credit Lines
  - Risk-Sharing Programs
  - Leveraging Commercial Financing through Performance Contracting
  - Equity Funds
- Summary of Lessons Learned
Importance of Energy Efficiency

Energy Efficiency → Most Cost-Effective Solution

- Enhancing Energy Security
- Reducing the Energy Supply/Demand Gap
- Mitigating Climate Change Impacts

Without Compromising Economic Development
Role of Energy Efficiency in Mitigating Climate Change

- Reference Scenario
- World abatement by technology:
  - 2020: 3.8 Gt, Efficiency 65%
  - 2030: 13.8 Gt, Efficiency 57%
  - Renewables & biofuels: 19% (2020), 23% (2030)
  - Nuclear: 13% (2020), 10% (2030)
  - CCS: 3% (2020), 10% (2030)
GENERATION COST ESTIMATES OF ALTERNATIVE ENERGY OPTIONS

- EE – Room ACS: (1.1 - 2.5)
- EE – Refrigerators: (1 - 3)
- EE – Distribution Transformers: (3.4 - 3.9)
- Coal (Pulverized w/o CO₂): (4.5)
- Biomass Heat: (1 - 5)
- Geothermal Heat: (0.5 - 5)
- EE – Electric Motors: (1.3 - 5.2)
- Natural Gas (new): (3.4 - 5)
- Coal: (4.3 - 4.8)
- Biomass Power: (5 - 6)
- Coal (IGCC and Supercritical): (3.6 - 6)
- Gas (Combined Cycle): (4.45 - 6.9)
- Wind (Onshore): (3 - 7)
- Coal (Pulverized w CO₂): (7.5)
- Biomass Power (IGCC): (2.8 - 7.6)
- Hydro (Large): (2 - 8)
- EE – Electric Motors: (1 - 8)
- Geothermal Electricity: (1 - 8)
- Wind (offshore): (6 - 10)
- Hydro (Small): (4 - 10)
- Nuclear: (3.9 - 14)
- Solar Thermal: (12 - 18)
- Methane Capture: (3 - 26)
- Solar PV Stand Alone: (8 - 40)
- Solar PV Grid Connected: (40 - 60)

US cents/kwh

(avoided cost)
McKinsey - Global GHG Abatement Costs

Source: McKinsey & Company
Energy Efficiency:
- Highly desirable
- Attractive economics
- High potential
- But, implementation of EE is far short of potential

Barriers to Energy Efficiency

- Policy/Regulatory
- End-users
- Equipment/Service Providers
- Financing Barriers
Financing Barriers to Energy Efficiency

- Availability of funds
  - Limited internal funds
  - Limited borrowing capacity
  - Lack of perceived incentives

- Information, awareness and communication
  - Information for project hosts and ESCOs
  - Communication between project developers and financiers

- Project development & transaction costs
  - Small project size
  - Project development costs
  - Other soft costs

- Risk assessment & management
  - Lenders' risk perception
    - Collateralization
    - M&V
    - Need for new financial products and appraisal tools

- Lack of capacity
  - Bank loan officers & risk managers
  - Energy service providers
  - Project hosts
  - M&V agents
A wide range of policy and regulatory instruments can be adopted to address the EE financing barriers.

**Government Policy and Regulatory Initiatives**

- Donor Agencies
- Energy Efficiency Laws
- Demand-Side Management
- Tax and Other Incentives
- Standard Offer Programs

**Financing Mechanisms**
Government Role vs. Market Role

**Government Role**
- Provide Incentives
- Develop Policies and Programs
- Stimulate Market development

**Long-Term Market Growth and Development**
- Sustainable Project Development and Commercial Financing
- Active Participation of Banks and Financial Institutions

IPEEC/WEACT and MEMR Workshop
Financing Mechanisms

Public

- Energy Efficiency Funds
- Utility Financing

PPP

- Dedicated Credit Lines
- Leveraged Commercial Financing

Private

- Risk-Sharing Programs
- Equity Funds
Public-Private Partnerships (PPPs) are mechanisms that use public policies, regulations or financing to leverage private sector financing for EE projects.

Key Characteristics of PPPs:

- A contractual relationship (or agreement) between a public entity and a private organization.
- Fair allocation of risk between the public and private partner to encourage the private partner to mobilize financing.
- Mobilization of increased private sector project financing for EE.
- Payments to the private sector for delivering services to the public sector.
**IEA Study of PPPs for EE Finance**

**Key PPP Characteristics**
- Formal agreement between public and private partners
- Equitable risk allocation between partners
- Mobilization of private financing
- Payments to private partner for services

**IEA study documents:**
- PPP mechanisms
- Importance and benefits
- Implementation procedures
- Examples and case studies
World Bank Study of Clean Energy Financing

- Documenting international experience in clean energy financing
- Addresses both EE & RE
- EE section includes
  - EE funds
  - Utility Financing
  - Dedicated Credit lines
  - Risk-Sharing Programs
  - Leveraging Commercial Financing with ESPC
  - Equity Funds
Energy Efficiency Funds
Energy Efficiency Funds

Designed to overcome the lack of fund availability

Funding Sources
- Donor agencies
- Government budget allocations
- Tariff levy on electricity sales
- Petroleum taxes
- Revenue bonds

Energy Efficiency Fund

Financing Mechanisms:
- Rebates, Incentives, Grants
- Low-interest loans,
- Pilot & demo projects,
- Subsidies for energy audits.

Projects:
- Project A
- Project B
- Project C
Examples in Asia

Thailand - Energy Conservation Fund (ENCON)
- EE Revolving Fund established in 2003
- Funding from petroleum taxes

Korea – Korea Energy Management Fund
- Large fund managed by KEMCO
- Loans to EE projects

India – State Energy Conservation Funds
- Kerala State ECF established with help from USAID ECO-Asia in 2010

Sri Lanka – Energy Conservation Fund
Utility Financing
Utility Financing

- Financing the customer’s investment in energy efficiency projects or equipment
- Recovering the investment cost through repayments on the customers’ utility bills
- Overcomes the customers’ lack of funds and interest in EE
- Facilitates processing and collection of loan repayments
- Benefits to utility as well as customers
Example: Bangalore Efficient Lighting Program

Figure 2.2 – BESCOM Efficient Lighting Program

<table>
<thead>
<tr>
<th>Target</th>
<th>Existing and New Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>District</td>
<td>Bangalore Urban</td>
</tr>
<tr>
<td>Sectors</td>
<td>LT-2 (Domestic) and LT-3 (Commercial)</td>
</tr>
<tr>
<td>Products</td>
<td>CFLs and 36W Fluorescent tubes</td>
</tr>
</tbody>
</table>

Selection of Lighting Suppliers
(Selection criteria – product quality, price, warranty period and retail network)

Issue of Lamps by Retailers
(Customer eligibility – no arrears at BESCOM; customer signs sales voucher)

Reimbursement of Suppliers
(Suppliers reimbursed by Financial Institution on a regular basis)

Issue of Invoices by Suppliers
(Invoice sent at regular intervals to Program Administrator for verification and processing)

Payment by Customers
(Payment in monthly installments through BESCOM billing system)

Payment to Financial Institution
(Payment by BESCOM of monthly collections to Trust Account)
Dedicated Credit Lines
**Program Rationale**

- Create interest on the part of commercial banks in financing EE projects
- Enhance technical capacity of banks to scale up EE lending
- Leverage parallel financing from the participating banks for EE financing
- Strengthen the participating bank’s capacity in identifying and managing project risks
- Assist the participating bank in exploring business opportunities in other low carbon lending and carbon financing businesses.
Structure of Dedicated Credit Line

- Public Agency
- Donor Agency Or Government
  - Provides Funds at Low Interest
- Public or Private Bank/FI
  - Adds Funds, Lends at Rates Below Market
- Project Developer
  - Project A
  - Project B
  - Project C

Obtain Project Financing
Example – CHEEF Program

World Bank China Energy Efficiency Financing Program
Credit lines from World Bank to 3 banks in China (Exim, Minsheng and Huaxia)

World Bank $100 M

Local Bank $100 M

Project A
Project B
Project C

Total Project Financing - $286M
70% Debt
30% Equity
Risk Sharing Programs
Partial Credit and Risk Guarantees

- Designed to address the risk perception of banks and financial institutions
- Government or donor agency provides a partial guarantee covering loan loss from default
- Participating banks sign agreements specifying loan targets and conditions
- Banks conduct due diligence and process loans
- In case of loan default the guarantee covers a portion of the loss – the program may also include a “first loss reserve”
- Substantial technical assistance also provided to banks, project hosts and project developers (ESCOs)
Successfully implemented the Commercializing Energy Efficiency Finance Program

IFC/GEF – Central & Eastern Europe

IFC/GEF

GFA

Participating Banks

Loans

Project Developers

IFC/GEF guaranteed 50% of the loss due to loan defaults
- Provided $49.5 million in partial risk guarantees (PRG)
- Default rate < 0.5%
- Demonstrated low risk & high return of EE projects
- Increased bank financing of EE projects
- High leveraging of IFC/GEF funds achieved – Investment > $200 M
- IFC program being replicated in Vietnam and Philippines
- India’s Bureau of Energy Efficiency is launching a PRGF program
Energy Savings Performance Contracts

- Energy Savings Performance Contracting (ESPC) Approach
- Turn-key basis
- Implementing Energy Efficiency Projects
- Offered by Energy Service Companies (ESCOs) or other energy service providers (ESPs)
**ESPC Services**

- Engineering
- Construction
- Installation
- Commissioning
- Measurement and Verification
- Design

ESCO Services
Common ESCO Business Models

Business Models for ESCOs

- Shared Savings
- Guaranteed Savings
- Energy Supply Contracting
**ESCO Experience - Asia**

- **Thailand**
  - ENCON fund promoted ESCO financing
  - New ESCO Fund created for equity and project financing

- **China**
  - World Bank helped developed ESCOs
  - Substantial growth of ESCO industry
  - New initiatives by Chinese Government

- **India**
  - ESCO accreditation scheme
  - Govt. and municipal ESCO programs
  - Super ESCO (EESL) established for public sector projects
Equity Funds
Role of Equity Funds

- Provide equity capital for commercializing of new or innovative EE technologies
- Provide equity capital to ESCOs for project development and financing
- Participate in EE projects as equity partners
- Difficulties in implementation due to relatively high cost of due diligence
- Private finance Assistance Network (PFAN) is actively pursuing EE equity financing
Examples of Equity Funds

Private Sector Equity Funds:
- FE Clean Energy (invested in Lighting Company in India)
- Nadathur Fareast (invested in Cogeneration company in the Philippines)
- Milestone Holdings (investing in street lighting and district heating projects in China)

Public Sector Equity Funds
- Thailand ESCO Fund
- India Venture Capital Fund for Energy Efficiency

Potential for PPPs
Lessons Learned
Moving from Public to Commercial Financing

- **Public-Private Partnerships**
  - Equity Funds
  - Leveraging Commercial Financing through ESCOs
  - Partial Credit or Risk Guarantees
  - Dedicated Credit Lines
  - Utility Financing
  - Energy Efficiency Funds

- **Commercial Financing**
  - Market Maturity

- **Public Financing**
Designing the Financing Mechanisms

Selection of mechanisms depends on local conditions
Different mechanisms may be needed for different sectors
Combinations of mechanisms may be more effective
International experience provides useful information, but must be adapted to local conditions

Country Context
End-use Sector
Financing Mechanisms
Maturity of Financial Markets
Legislative/Regulatory Framework

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Questions for Discussion

- What are some of the successful financing mechanisms implemented in Asia?
- What can we learn from the experience of other countries?
- What are the main regulatory and policy instruments that need to be in place for these mechanisms to work?
- How can we encourage public-private partnerships in energy efficiency project financing?
- How can we best enhance the capacity of the financial institutions and the energy service providers?
- Where can we get additional information?
Thank you

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