The International Partnership for Energy Efficiency Cooperation (IPEEC) - Clean Energy Solutions Center

Energy Efficiency Financing

27 September 2012

Amit Bando – Moderator

Dr. Jae Hoon LEE, Amit Kumar, Gudrun Gumb, Dr. Henrike Koschel - Panelists
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- http://cleanenergysolutions.org/training/ and www.ipec.org
• Welcome and Introductory Remarks

• Overview of the IPEEC – Energy Solutions Center collaboration
  ➔ Amit Bando, Executive Director, IPEEC

• Energy Efficiency Financing – Panel Discussion
  ➔ Dr. Jae Hoon Lee, Director Financial Support Dept., KEMCO
  ➔ Amit Kumar, Associate Director GRID, Energy and Utilities, PwC-India
  ➔ Gudrun Gumb, Principal Economist Strategy Division, KfW Bankengruppe

• Questions and Answers

• Discussion and Closing Remarks
IPEEC: a High-level International Forum

- Provides global leadership on energy efficiency (EE) by identifying & facilitating government implementation of policies & programs that yield high EE gains.

- Promotes information exchange on best practices and facilitates initiatives to improve energy efficiency.

- Reports to G20 Summit, Clean Energy Ministerial & others.

- Partners with industry to promote rapid deployment of energy efficient technology.
IPEEC is an Autonomous Entity

Members account for over 75% of world GDP and energy use.

- EU
- United Kingdom
- France
- Canada
- USA
- Mexico
- Brazil
- Germany
- Italy
- Russia
- Japan
- Republic of Korea
- China
- India
- Australia

IPEEC was established in 2009 at the G8 summit in Italy

The IPEEC Secretariat is located in Paris, France
Clean Energy Ministerial (CEM) launched the Clean Energy Solutions Center in April, 2011 for major economy countries

- One of eleven CEM Initiatives
- Led by Australia & U.S. with other CEM partners

Partnership with UN-Energy is extending scope to support all developing countries

- Enhance resources on policies relating to energy access, small to medium enterprises (SMEs), and financing programs
- Offer expert policy assistance to all countries
- Expand peer to peer learning and training
Goals

- Serve as a first-stop clearinghouse of clean energy policy resources.
- Share policy best practices, data, and analysis tools across countries.
- Deliver dynamic services that will enable expert assistance, learning, and peer to peer sharing of experiences.
- Foster dialogue on emerging policy issues and innovation across the globe.

Target Audiences

- Primary:
  - Energy policy makers and advisors
  - Analysts

- Secondary:
  - Private sector companies,
  - Energy entrepreneurs and investors
  - Non Governmental Organizations
  - Civil society
  - Others engaged in clean energy
We connect you to a global network of energy experts for personalized attention and quick response technical assistance on strategies, regulations, standards, financial incentives, and deployment programs for a broad range of clean energy sectors and technologies including:

- Energy Access
- Energy Efficiency
- Renewable Energy
- Smart Grid
- Transportation
- Utilities

Requesting Assistance:

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How You Can Get Involved

- Request expert assistance or tailored technical resources for your country
- Participate in webinars, training activities, and policy networks
- Offer advice and suggest resources to share
- Sign up for the newsletter
- Join conversations on the Policy Forum
Energy Efficiency Financing in KOREA

(Korea Energy Management Corporation)
Main Goals of KEMCO

- Improve the efficiency of the funding procedure that supports more efficient use of energy.
  - Strengthening financial assistance for exemplary energy-saving facilities
  - Expanding financial assistance for small and medium enterprises
  - Continuing search for exemplary energy-saving facilities
Financial Assistance for Installing Energy-Saving Facilities

- **Eligibility:** Any business or company seeking to install or adopt energy-saving facilities.

- **Scope of assistance:** up to 80% of the required funding.

- **Interest rate:** Quarterly variable rate (Treasury bond – 1.25%).

- **Loan period:** grace period of 3 years, and repayment in installments over the next 5 years.
**Funding Procedure**

- Apply for KEMCO’s recommendation and submit it to a financial institute.

1. Applicants apply for recommendation to KEMCO.
2. KEMCO decides whether applicants can get a recommendation or not.
3. Applicants can use the recommended loan though the bank.
4. There is a lend agreement between KEMCO and banks.
Financial Assistance for Energy-Saving Facilities

- Amount Provided (1980~2011) : 8.6 billion USD

![Graph showing financial assistance over years with specific amounts for each year.]

![Pie chart showing proportions of each facility: Waste heat recovery 38%, Boiler & Furnace 22%, Lighting 1%, others 9%, High efficiency equipment 4%, Building 2%, Power 2%, Paper & dyeing 1%, and Process revamping 21%.]

In total amount provided, the proportions of each facility are as follows: Waste heat recovery 38%, Boiler & Furnace 22%, Lighting 1%, others 9%, High efficiency equipment 4%, Building 2%, Power 2%, Paper & dyeing 1%, and Process revamping 21%. 
ESCO System in Korea

- Launched in 1992
- 226 ESCOs as of Sep. 2012
- ESCOs can use Energy Conservation Fund (Government budget)
- Korean Government announced “ESCO Activation Plan” to promote Korea’s ESCO market (2010.10)
ESCO Project model

- We have “Shared Savings model” & “Guaranteed savings model”

1. S.S contract
2. Requesting recommendation
3. Publishing Recommendation
4. Requesting loans
5. Giving Loans

Energy users ➔ ESCOs ➔ KEMCO ➔ Banks

✓ Loan applicant for “Guaranteed savings”: Energy User
Guaranteed savings contract is not yet settled in KOREA’s ESCO market
Why You Need ESCOs

Energy efficiency is the first choice of policy planners trying to meet national mandates for greenhouse gas reductions.

As with savings mandates, ESCO projects enable to meet greenhouse gas reduction mandates, which are not accompanied by capital budget increases to meet these mandates.
Yearly ESCO project record
Applied areas in ESCO

Waste Heat Recovery System
- Mechanical (Thermal) Vapor Re-compressor
- Heat exchanger for heating or cooling
- Heat Recovery Boiler

Process Improvement
- Replacement of old industrial kilns
- Alternative fuel-using facilities

Building
- Boiler replacement
- LED Lighting installation
- Inverter
- HVAC system improvement
Tax Incentive

- **Tax Incentives for energy efficiency investments**
  - The replacement or installation of the facilities and equipment was qualified for 10 percent of income tax credit from 2005 to 2008.
  - 20% tax deduction in 2009, 2010
  - 10% tax deduction in 2011

- **Eligibility**: Facilities defined by the tax laws such as industrial boiler

- **Procedure**: Investors report application directly to the tax office
Assessment of Energy Efficiency Financing Mechanisms
International Partnership for Energy Efficiency Cooperation (IPEEC)

Amit Kumar | Associate Director – GRID, Energy and Utilities | PricewaterhouseCoopers (pwc.com)
Agenda

- Objective of AEEFM Task
- Barriers in energy efficiency financing
- New innovative financial instruments
- Conclusion
- Future activities ....
Objective of AEEFM - IPEEC

The objective of the task group was to develop significant understanding of barriers associated with financing of energy efficiency, and identify strategies to overcome those barriers. This task would also focus on exploring the avenues available to national governments to promote financing of energy efficiency.

Activities Performed

<table>
<thead>
<tr>
<th>Sub Task</th>
<th>Activities Performed</th>
</tr>
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<tbody>
<tr>
<td>Sub-Task-1:</td>
<td>Survey of the best practices in elimination of barriers in energy efficiency financing</td>
</tr>
<tr>
<td>Sub-Task-2:</td>
<td>Study/ review of existing financial mechanisms and economic incentives programs in the participating countries</td>
</tr>
<tr>
<td>Sub-Task-3:</td>
<td>Identify new innovative financial instruments</td>
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<td>Sub-Task-4:</td>
<td>Analyse policies and measures needed to significantly enhance investments in energy efficiency market among participating countries</td>
</tr>
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<td>Sub-Task-5:</td>
<td>Information dissemination workshop</td>
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</table>
**EE financing mechanism**

Energy Efficiency Financing (EEF) Mechanism is defined as the method through which funding is made available

- Grant, Subsidy
- Accelerated depreciation, Tax deductions, Tax credits, Tax reductions
- Guaranteed savings, Shared savings

- Bank window, Low interest lending, Collateral free lending
- Lending programs
- Tax incentive
- Carbon Financing
- Performance contracting
- CDM funding

Assessment of Energy Efficiency Financing Mechanisms  
PwC  
Sep 2012
## Initiatives taken by participating countries

<table>
<thead>
<tr>
<th>Financing Mechanism</th>
<th>Key Barriers in each Mechanism</th>
<th>Identified Mitigating Measures</th>
<th>Country Initiatives</th>
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<tbody>
<tr>
<td>Tax incentive</td>
<td>• Free riders,</td>
<td>• Establishing a list of eligible technologies and equipments,</td>
<td>EE Lending – Japan, VAT reduction, Tax Credit – France, Interest rate buy down - US</td>
</tr>
<tr>
<td></td>
<td>• High cost on the government budget</td>
<td>• Collecting Public money through cess and dissipating</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Careful drafting of policies and regulations</td>
<td></td>
</tr>
<tr>
<td>Non Tax incentives</td>
<td>• Free riders,</td>
<td>• Careful drafting and administration of policies, regulations and programs</td>
<td>Subsidy / Grant through ARRA fund– US</td>
</tr>
<tr>
<td></td>
<td>• High cost on the government budget</td>
<td></td>
<td></td>
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<tr>
<td>Lending programs</td>
<td>• High risk perception</td>
<td>• Risk guarantee funds for EE</td>
<td>PRGF, CGTMSE – India FOGIME – France On Bill Financing, Lien on meter– US</td>
</tr>
<tr>
<td></td>
<td>• High transaction cost</td>
<td>• Establishing a list of eligible technologies and equipments,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Collateral</td>
<td>• Innovative funds providing collateral free lending</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Weak Repayment</td>
<td>• Lien on meter or property &amp; repayment through monthly utility bills</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lack of knowledge and confidence in savings</td>
<td>• Standard project appraisal manual for knowledge and confidence building</td>
<td></td>
</tr>
<tr>
<td>Performance contracting</td>
<td>• Creditworthiness of ESCO’s</td>
<td>• Setting up of super ESCO</td>
<td>EESL - India IPMVP– US</td>
</tr>
<tr>
<td></td>
<td>• Lack of standard protocol for M&amp;V</td>
<td>• Accrediting ESCO’s</td>
<td>How$mart program - US</td>
</tr>
<tr>
<td></td>
<td>• Split incentives</td>
<td>• Standard M&amp;V protocol</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Lien on meter or property &amp; repayment through monthly utility bills</td>
<td></td>
</tr>
<tr>
<td>Carbon Financing</td>
<td>• High transaction cost</td>
<td>• Program of Activities (PoA)</td>
<td>CDM – India Domestic CDM – Japan, RGGI - US</td>
</tr>
<tr>
<td></td>
<td>• Availability of funds</td>
<td>• Cross – Financing</td>
<td></td>
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</table>
Innovative EE financing instruments

Innovative EE financing instruments are those new and/or successful financing models which are recently developed or in the process of development in the participating countries.
**Revolving Loan Funds (RLF)**

**Principle:** RLF is a source of fund through which EE lending could be promoted in the state. Loans are made to borrowers consistent with standard prudent lending practices. As loans are repaid by the borrowers, the money is returned to the RLF to make additional loans.

**Initial capitalization:** The initial capital required for RLF could be arranged either from the central or the state government budget.

**Other Funding Sources:** The other sources of capital could be any or combination of the following:
1. State Energy Conservation Bonds
2. Bank Capital (Public or Private)
3. Venture Capital or Private Investors Money
4. Electricity tax/ duty/ cess etc

**Management Cost:** Management of RLF shall be the prime responsibility of the state Government.

**Interest and Fees:** The “lending rate” and the “loan term” shall be strategically chosen in a way to promote the basic objective of RLF.
Example: *Energy Conservation Fund, France*
**On Bill Financing (OBF)**

**Principle:** OBF generally refers to a financial instrument that is serviced by or in partnership with a utility company for EE improvements and repaid by the customer on its monthly utility bill.

**Capital Sources** The initial capital required for OBF could be arranged either from the central or the state government budget to promote EE and reduce carbon footprints.

**Management** Generally the management/administration of such program is the responsibility of utility. The programs can also be administered by third party lending institution, state government energy office, third party service organization etc.

**Lending & Repayment** If utility lends the money directly to the borrower then it will recover the same through the monthly bill. But if the third party lender lends the money to the borrower then repayment would be through utility via monthly bill.

**Example:** *Midwest Energy, Inc. – How$mart, USA*
Revenue Decoupling (RD)

**Principle:** Decoupling breaks the link between Utility Revenue and kWh sold. This instrument if applied can align utility incentives with state goals.

Under decoupling, utilities receive differing rates (per kWh) depending on total electricity demand. If demand increases above a state-identified target, the rates fall; if demand decreases, rates rise.

**Revenue Decoupling Model**

<table>
<thead>
<tr>
<th>From the Rate Case</th>
<th>Post Rate Case Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Revenues</td>
<td>$10,000,000</td>
</tr>
<tr>
<td>Test year unit sales</td>
<td>100,000,000</td>
</tr>
<tr>
<td>Price per unit</td>
<td>$0.10/ unit</td>
</tr>
<tr>
<td>Number of customers</td>
<td>200,000</td>
</tr>
<tr>
<td>Revenue per customer (RPS)</td>
<td>$ 50</td>
</tr>
</tbody>
</table>

Till Date 14 states in USA, have adopted Decoupling
**Energy Conservation Bonds (ECB’s)**

**Principle**: Bonds are debt instruments issued by a state or local government (or an eligible entity) that are either sold in the public market, placed with investors by an investment banking firm, or purchased directly by a bank.

**Types of EC-bonds**: Tax Exempt Bonds; Tax Credit Bonds

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### Benefits of EC-Bonds

- Focused bonds for EE activities
- Rebate to the borrower in terms of tax credit or tax exempt
- Allow qualified central, state, local authority to issue debt at extremely low rates
- Engages private investors towards energy efficiency

### Challenges in EC-Bonds

- Burden on Govt. budget
- Carriers few legal issues
- Lengthy Issuing Process Time

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**Example**: *Qualified Energy Conservation Bond, USA*
Funds Securing Private Lending

**Principle** Rather than giving direct capital subsidy, which may increase the possibility of Gaming, federal / state funds are being utilised in creating innovative funds for the purpose of promoting EE financing. These innovative funds includes:

- **Interest rate buy down fund** - The interest rate is typically bought down by a dedicated federal/ state non-revolving fund. The lower interest rate offered by the private banker motivates borrower for energy efficiency projects.

- **Partial Risk Guarantee / Loan loss recovery fund** - The fund provides partial risk coverage to lenders meaning that the reserve will cover a pre-specified amount of loan losses.

- **Venture capital funds** – Would ease a significant barrier from the viewpoint of risk capital availability to the ESCOs

Example: *PRGF and VCF fund*, India
## Conclusion & Way Ahead

Energy Efficiency policy initiatives and roadmap varies from country to country. Depending on the market maturity these policy interventions are designed and implemented. EE Financing mechanisms are different for different markets, as explained in table below:

<table>
<thead>
<tr>
<th>I. Premature Market</th>
<th>II. Transforming Market</th>
<th>III. Mature Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant, Subsidy</td>
<td>Performance contracting</td>
<td>Innovative Lending</td>
</tr>
<tr>
<td>Tax Incentives</td>
<td>Carbon financing</td>
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</tbody>
</table>

### Barriers Identified

<table>
<thead>
<tr>
<th>I. Premature Market</th>
<th>II. Transforming Market</th>
<th>III. Mature Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>High first cost , High transaction cost, Liquidity</td>
<td>Recourse financing, Lack of std. M&amp;V, Implementation</td>
<td>High perceived risk, Split incentives</td>
</tr>
</tbody>
</table>

### Financing Tools

<table>
<thead>
<tr>
<th>I. Premature Market</th>
<th>II. Transforming Market</th>
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<tbody>
<tr>
<td>Accelerated depreciation, Tax deductions, Tax credits, Tax reductions, Rebates, Subsidies</td>
<td>Guaranteed savings, Shared savings, Carbon financing , Collateral free lending, IPMVP</td>
<td>Interest rate buy down, Loan Loss reserve, Risk guarantee funding, On bill financing, Revenue Decoupling, Revolving loan funding, etc</td>
</tr>
</tbody>
</table>

Depending on local condition like consumer lending law, state legislation, political stability, institutional arrangement, degree of awareness, availability of technology etc, respective EE financing program is designed.
**Future activities which should be taken up....**

- Expand the reach to other willing countries.
- Join hands with other multilats/bilats agencies who have worked in this area to develop a comprehensive plan.
- Identify shortcomings in the current policies and programs in the participating (new) countries/regions.
- Map best policies programs from 5 countries (participated in AEEFM task) on shortcomings.
- Define country specific strategies specifically public policies and programs to overcome the shortcomings. These strategies could be amendments to current policies and programs or be new policies and programs altogether.
- Facilitate dialogue among international EE policy experts and national stakeholders including policy makers leading to implementation of these strategies.
Thank You

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