Financing Mechanisms for Energy Efficiency

Scene-Setter Presentation

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Energy Efficiency (EE): A “No Brainer”


...the cheapest source of energy, enhanced energy security, & GHG emissions reduction...

...and brings multiple co-benefits for all energy market stakeholders...

*Notes: Energy efficiency program portfolio data from Molina and Ruff 2018. Represents costs to utilities or program administrators only, including shareholder performance incentives if applicable. All other data from Lazard 2018 Unsubsidized Levelized Cost of Energy Comparison.

Sources: IEA and Lazard
Global EE Investments – Needs far exceed Actuals

~4X Investment Needed to convert full EE potential to energy savings

Source: IEA
Why Do We Need Innovative EE Financing Models?

Energy Efficiency (EE) Market Ecosystems are the Most Complex...
Scaling up EE Implementation faces Multiple Barriers

Supply Side Options
(Conventional Supply & Large Scale RE)

- Large Investments
- Fewer Stakeholders
- Standardized Solutions
- Less Transaction Costs
- Homogenous Market
- Asset- or Revenue based Financing

Demand Side EE Measures

- Small and Dispersed
- Multiple Stakeholders
- No “One Size Fits All” Solutions
- High Transaction Costs
- Heterogenous Market
- Financing based on “Savings”

But solutions have been developed and are being applied and replicated...

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EE Financing Alone is not the Panacea…
Transforming Markets by Addressing EE Market Failures and Barriers
Requires Multi-Pronged Efforts

Policy and Regulations
- Overarching EE legal framework (EE Law)
- Cost-reflective energy pricing
- Building Codes/ Appliance standards
- EE incentive schemes w/ funding sources
- EE targets by sector
- Public budgeting/procurement encourages EE

Institutions
- Dedicated entity with EE mandate
- Clear institutional roles/accountability
- Inter-ministerial coordinating body
- Assignment of roles for monitoring and compliance enforcement
- Authority to formulate, implement, evaluate and report on programs
- Tracking on progress for EE targets

Information and Awareness
- Database on energy consumption
- Industrial and building stock
- Information center/case study database
- Database of service providers, EE technologies, equipment providers
- Broad, sustained public awareness
- Appliance labeling

Finance
- Commercial bank lending (credit lines, guarantees)
- Pay As You Save -based EE financing
- Utility Demand Side Management
- Commercial ESCO financing
- Public Super ESCO
- Public sector EE financing
- EE Residential home/appliance credit
- EE Equipment leasing incentives
- Green/EE building incentives

Technical Capacity
- Energy auditor/manager training and certification programs
- Private sector training programs (banks, ESCOs/EE service providers, end users)
- EE project templates (audits, M&V plans, EPC bidding documents, contracts)
- Energy management systems developed


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- Financing mechanisms should be selected based on stage of market development and financing gaps
- Public financing should be used judiciously to develop markets and crowd-in commercial financing
- Over time, programs should seek to climb the ladder to more sustainable and commercial models
What Drives EE through Utility DSM (on-bill financing)?
Regulatory Drivers, Incentives and Utility Benefits

The Objective

- **Capacity Deferral**
  - Delaying investments in new generation capacity to meet reserve requirements

- **Improved Reliability**
  - Developing curtailment capability to address short-term/emergency supply shortfalls

- **Deferral of T&D Upgrades**
  - Delaying investment in specific, localized substations and feeders using DR as a demand side resource

- **Operational Cost Savings (Economic Dispatch)**
  - Reduction of system operating costs through fewer starts of peaking units, reduced need for spinning reserve from generators, and economic dispatch of DR resources

- **Integration of Intermittent Renewable Resources**
  - A possible alternative to new generation or a more economical way to provide ancillary services

- **Regulatory requirements**
  - Commission rulings to have ESPs fund and operate DR programs or achieve DR curtailment goals

Sources: LBNL, EPRI, etc

The Outcome

- **Peak-Day Load Shape Before and After Load Control**

  - Projected Load
  - After Load Control

  - 250 MW
  - 1000 MW
  - 500 MW

  - Use more DR resources
  - Use few DR resources

The Enablers

- **Tariff Incentives and Rebates**
- **Technologies: EE Appliances, RE, Storage, EVs..**
- **Digitalization and Communication Platforms (Smart Grid, Meters, Appliances)**
Financing can be in the form of:

- Traditional loans
- Cofinancing with commercial banks
- Loan guarantees
- Forfeiting
- Budget capture
- Energy service agreements
Opportunities and Challenges of Transforming EE Markets through ESCOs

**Challenges ESCOs Face**

- **Private ESCOs perceive higher risks of getting paid for their investment through energy cost savings by the public sector.**
- **Separation of capital and operating budgets makes it difficult to capture budget savings to repay the ESCO.**
- **Restrictive public sector procurement rules.** Focus on the lowest bid rather than the best value for money.
- **Public sector barriers.**
- **Limited technical capacity of public buildings to understand and implement energy efficiency programs.**
- **Borrowing restrictions of public agencies and unwillingness of banks to provide project financing.**
- **Lack of incentive for public sector staff to save energy.**


Source: World Bank Live Wire on Super ESCOs, 2018

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EE Financing through Super ESCOs
To Support Private ESCO Market Development

Super ESCO - Key Functions:
• Demand Aggregation
• Financing
• Standardization
• Private ESCO Support

Sources: ADBI (Ablaza et al (2020)), World Bank Live Wire on Super ESCOs, 2018
Global Super ESCO Experiences: Selected Examples

Armenia R2E2 Fund

FEDESCO (in Belgium)

Etihad ESCO (in UAE)

Tarshid (in Saudi Arabia)

Source: World Bank Live Wire on Super ESCOs, 2018

Source: World Bank, 2016. Note: BAS = building automation system; ESCOs = energy service companies.

EE Financing and Business Models Are Evolving

The Five Megatrends:
Disruption (Demand Disruption), Decarbonization, Distribution/Decentralization, Democratization, Digitalization

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Thank You

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