Financing Mechanisms for Energy Efficiency

Scene-Setter Presentation

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WORLD BANK GROUP
Energy & Extractives

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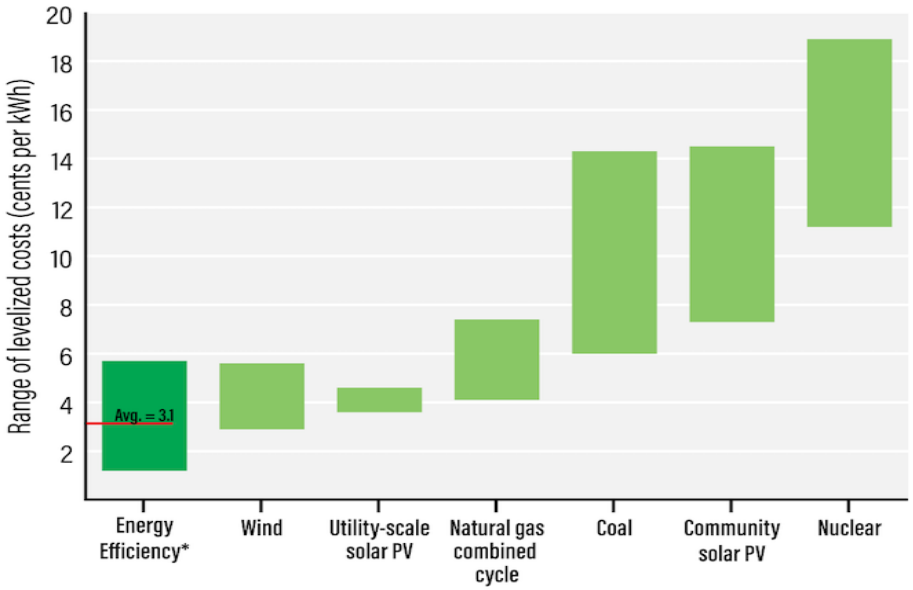
Energy Efficiency (EE): A "No Brainer"

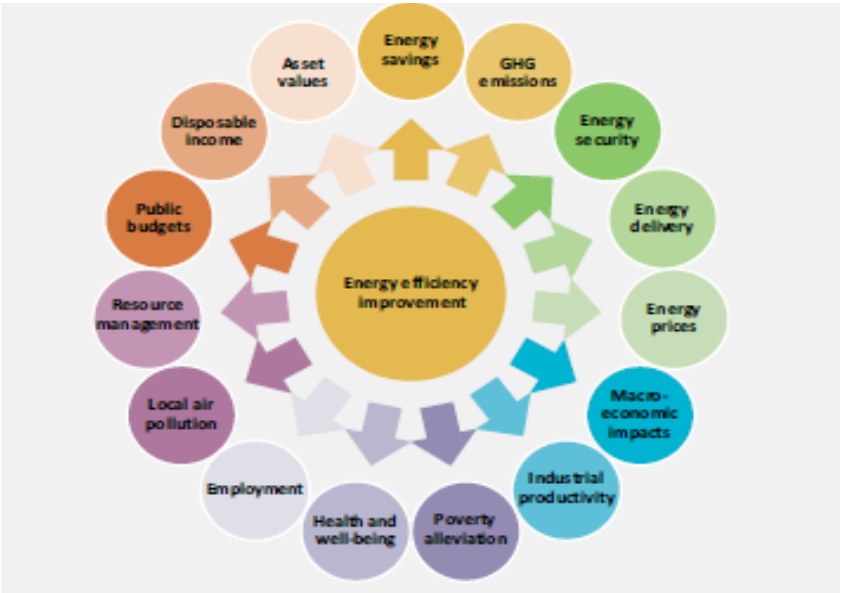
LABELS: "First Fuel", "Cheapest Fuel", "Low Hanging" GHG Mitigation, "Money Lying on the Street", "Jobs Machine"

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



*Notes: Energy efficiency program portfolio data from Molina and Relf 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.

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



Sources: IEA and Lazard

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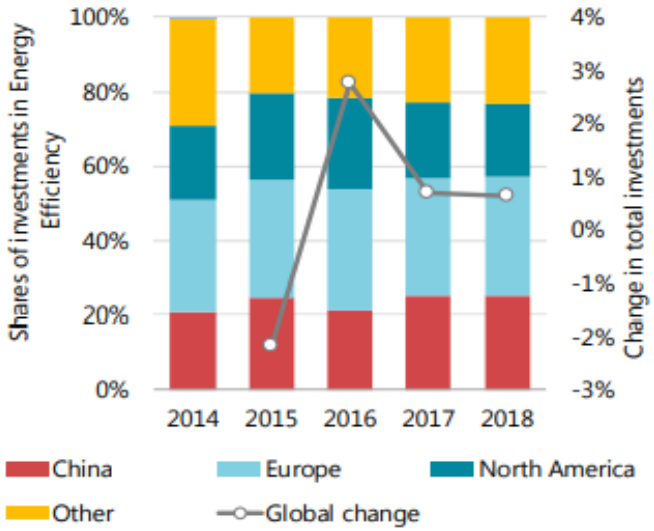
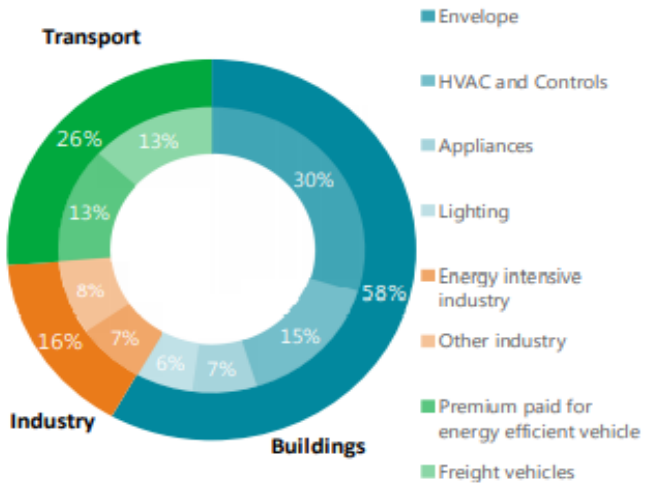
Global EE Investments – Needs far exceed Actuals

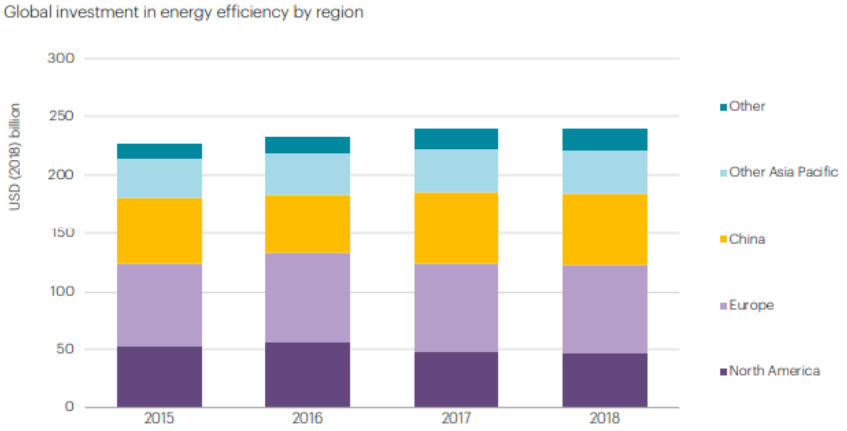
Figure 3.10 Energy efficiency investment by region, 2014-18 (left) and by sector in 2018 (right)

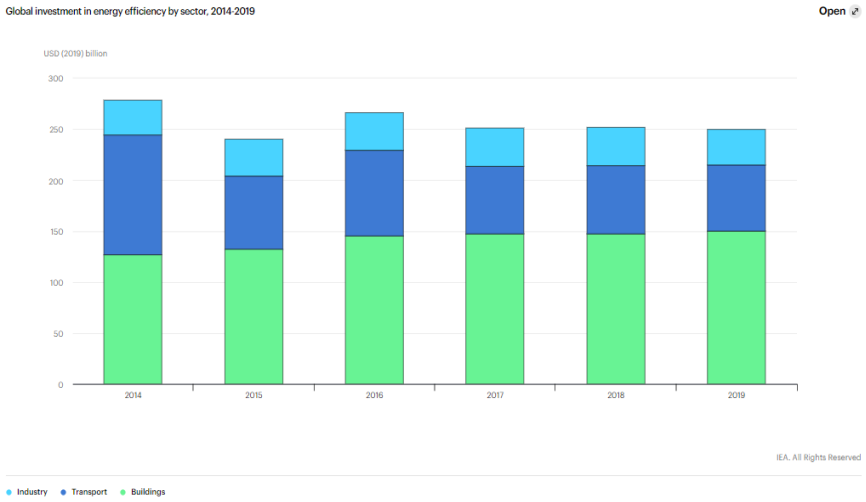




~4X Investment Needed to convert full EE potential to energy savings

Source: IEA





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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

Successful Energy Efficiency Programs

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

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

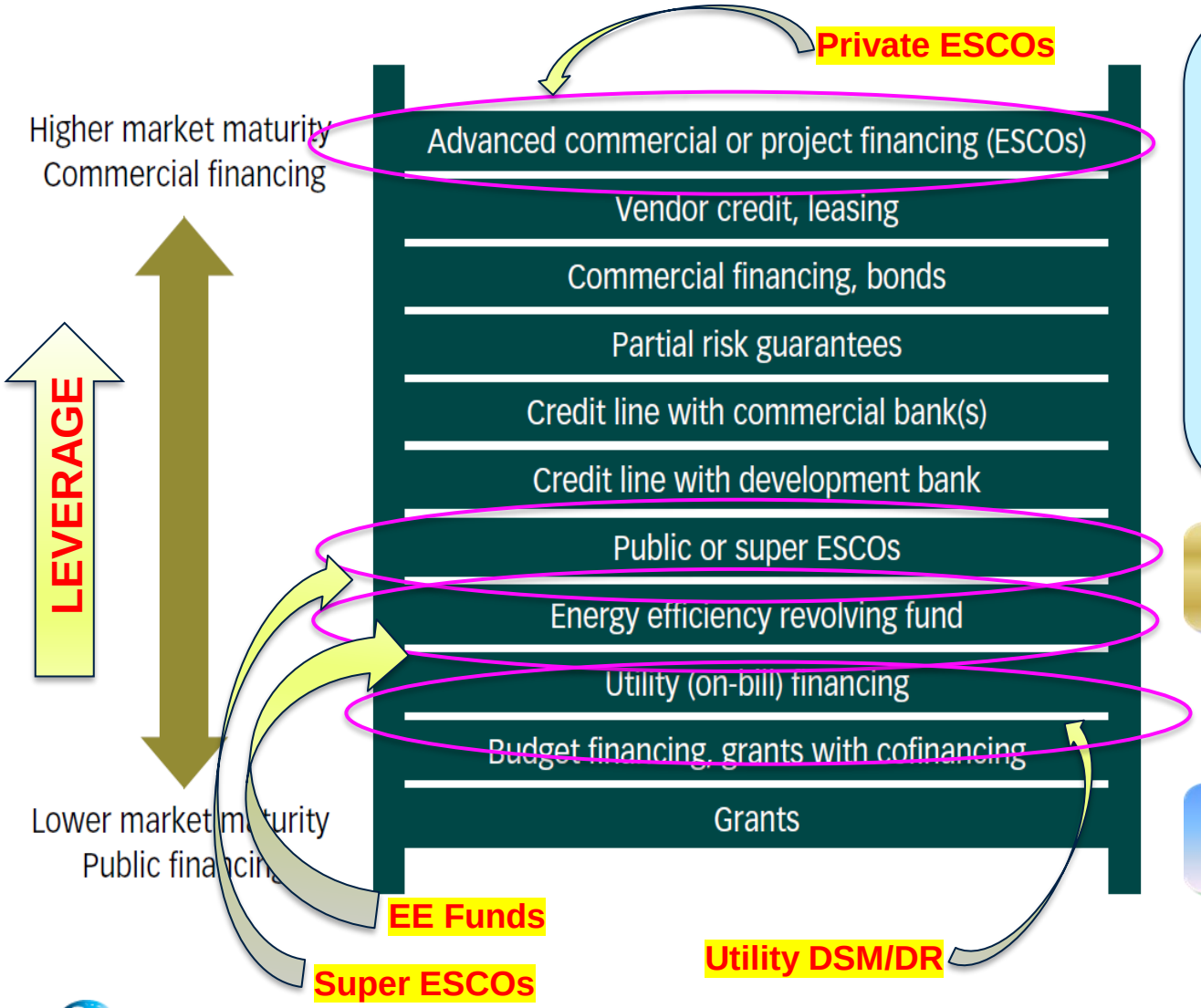
Finance

- 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

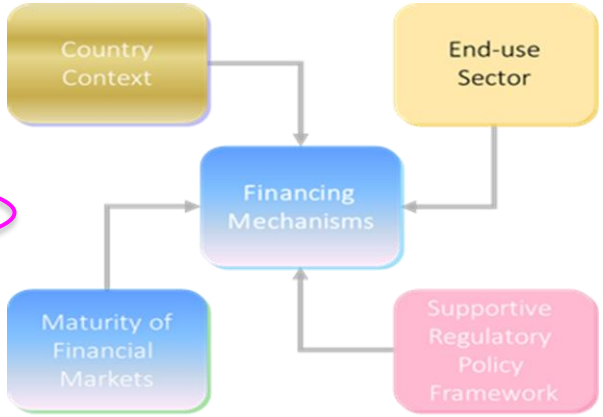
Source: World Bank (2016)

Energy Efficiency Financing Mechanisms "Ladder":

Unlocking Private Capital for Large-Scale EE Market Transformation



- 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



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What Drives EE through Utility DSM (on-bill financing)?

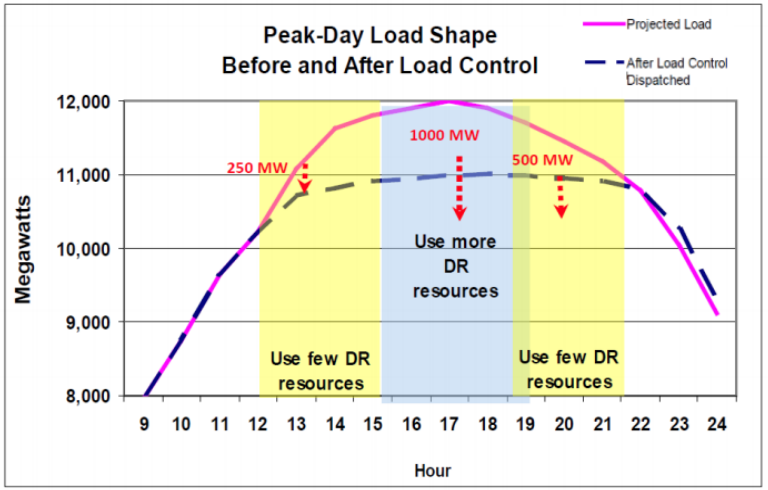
Regulatory Drivers, Incentives and Utility Benefits

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

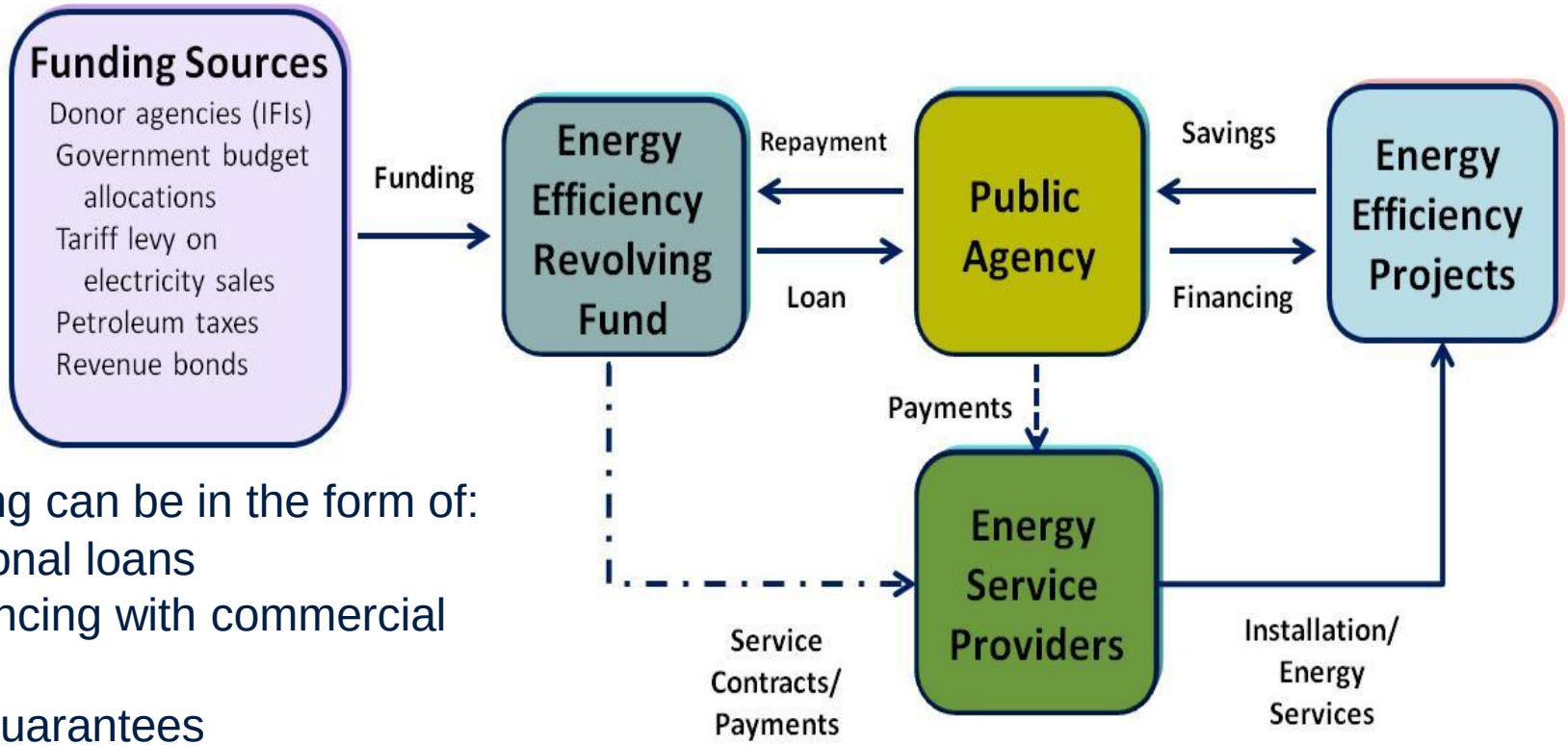
The Outcome



The Enablers

- **Tariff Incentives and Rebates**
- **Technologies: EE Appliances, RE, Storage, EVs..**
- **Digitalization and Communication Platforms (Smart Grid, Meters, Appliances)**

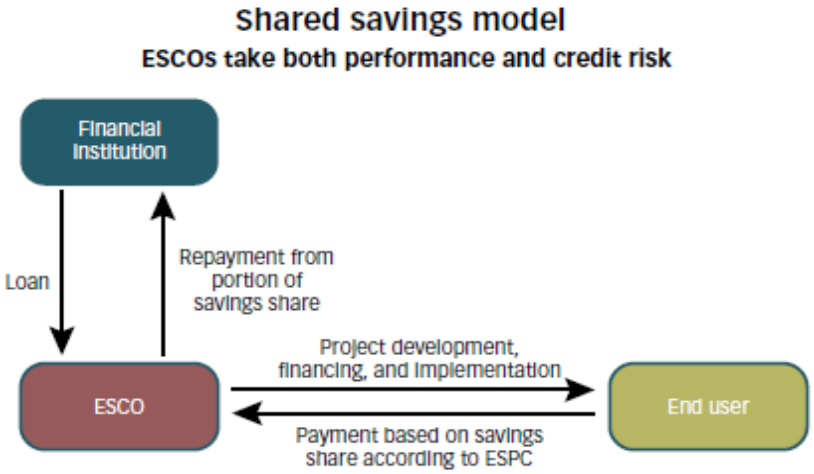
EE Revolving Fund Financing

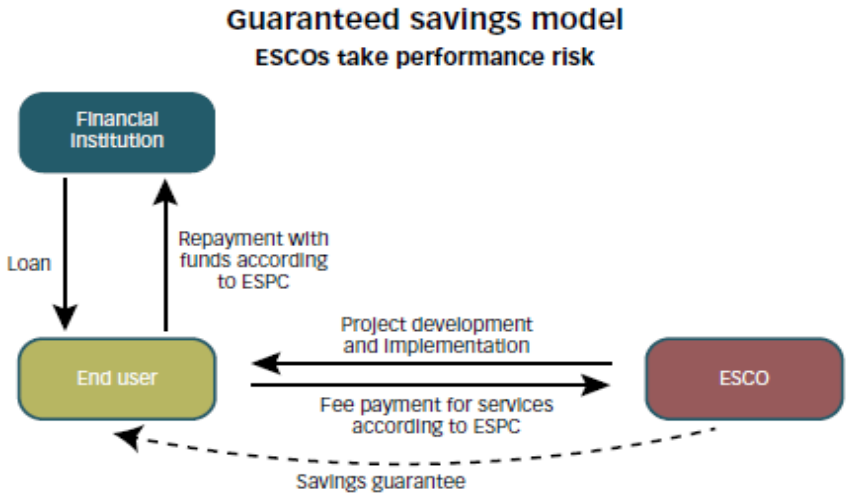


Financing can be in the form of:

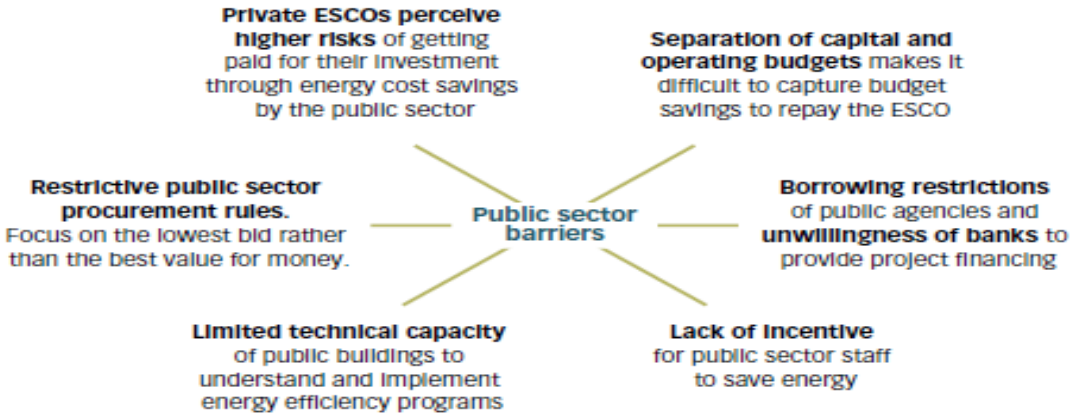
- Traditional loans
- Cofinancing with commercial banks
- Loan guarantees
- Forfeiting
- Budget capture
- Energy service agreements

Opportunities and Challenges of Transforming EE Markets through ESCOs



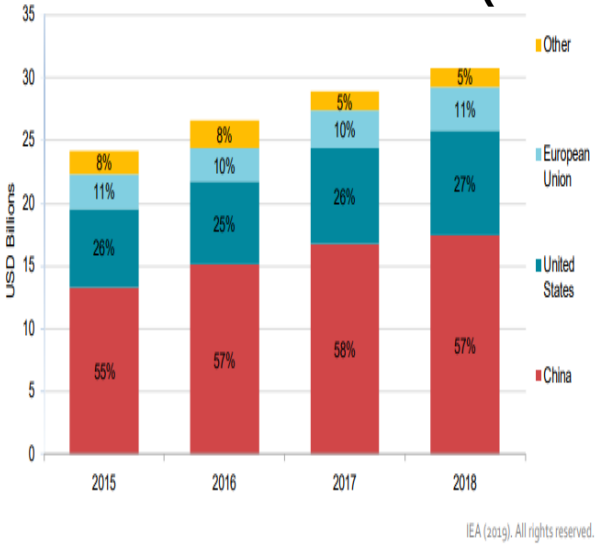


Challenges ESCOs Face



Source: World Bank Live Wire on Super ESCOs, 2018

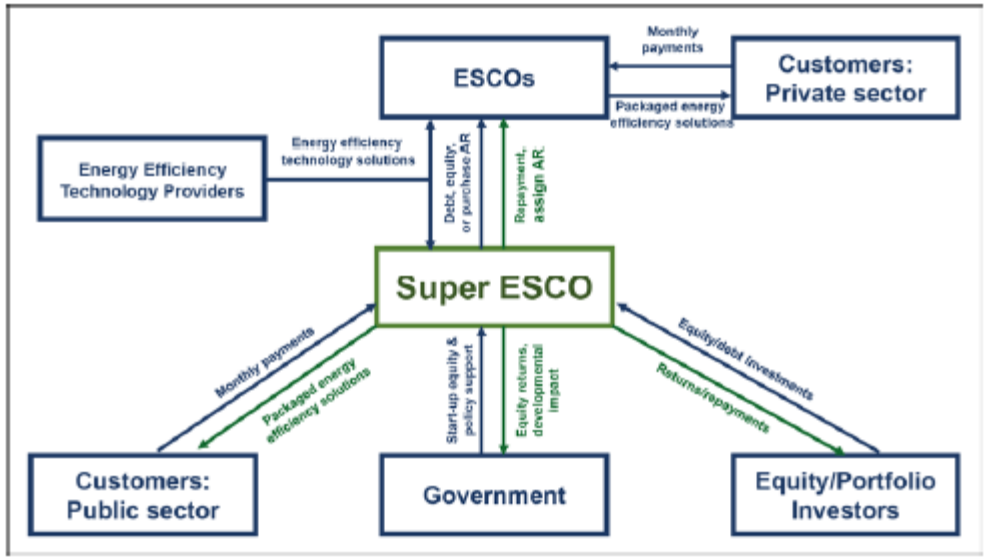
Global ESCO Market Growth (2015-2018)

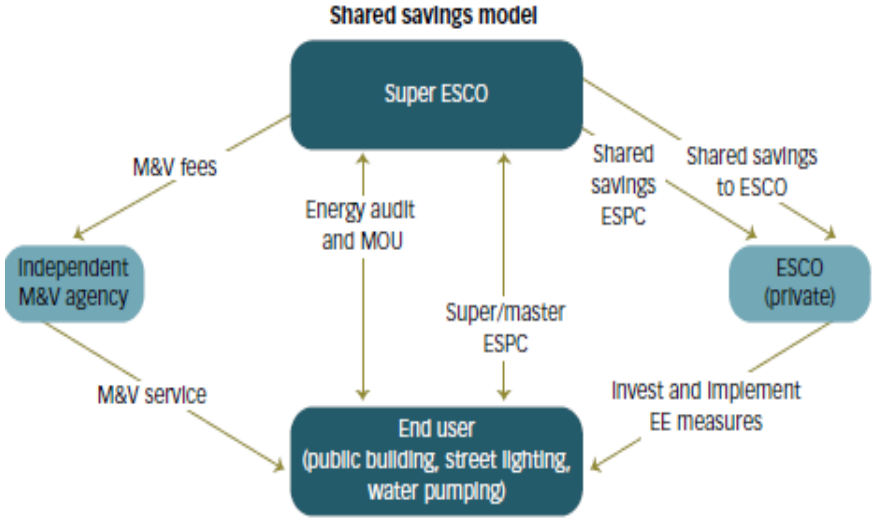


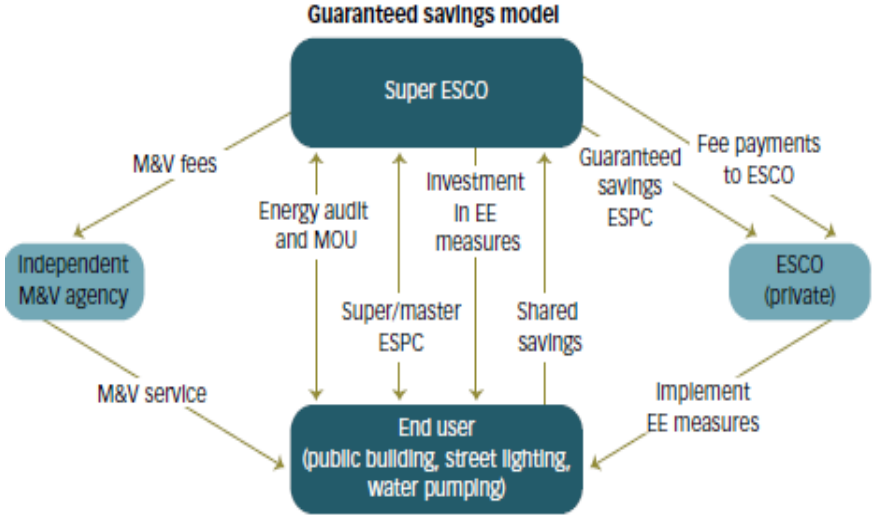
EE Financing through Super ESCOs

To Support Private ESCO Market Development

Illustration of a Super ESCO Concept







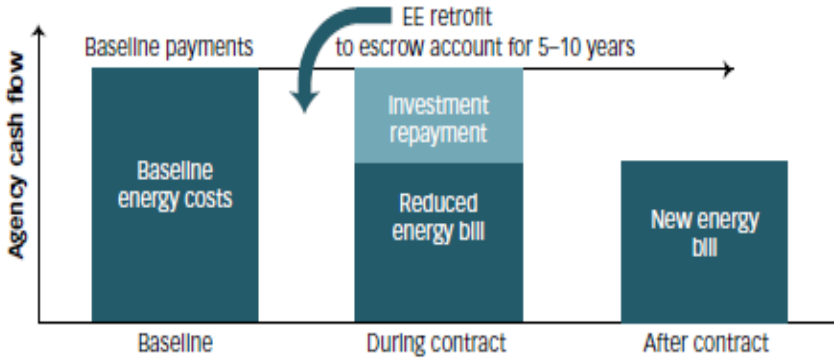
Super ESCO- Key Functions:

- Demand Aggregation
- Financing
- Standardization
- Private ESCO Support

Sources: ADBI (Ablaza et al (2020)), World Bank Live Wire on Super ESCOs, 2018

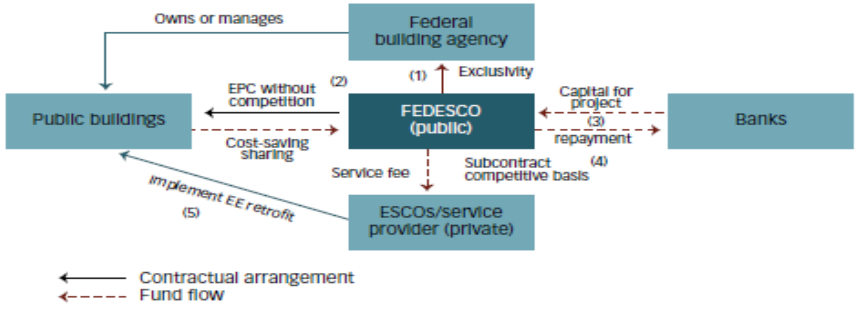
Global Super ESCO Experiences: Selected Examples

Armenia R2E2 Fund



Source: World Bank, 2016b.

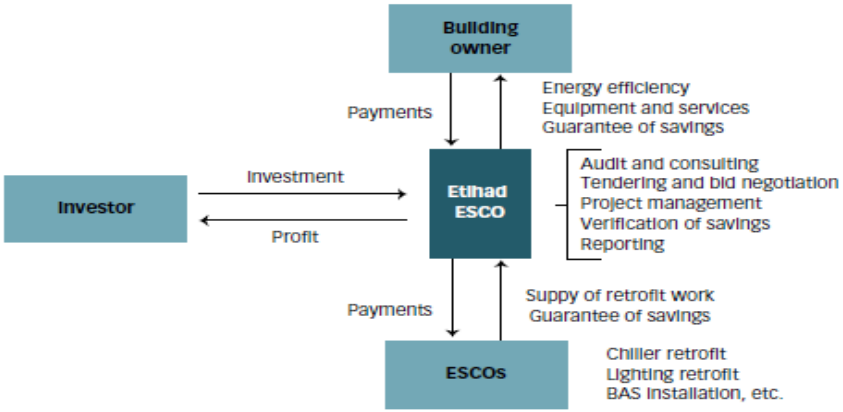
FEDESCO (in Belgium)



Source: World Bank, 2018a.
Note: EPC = engineering, procurement, and construction; ESCOs = energy service companies.

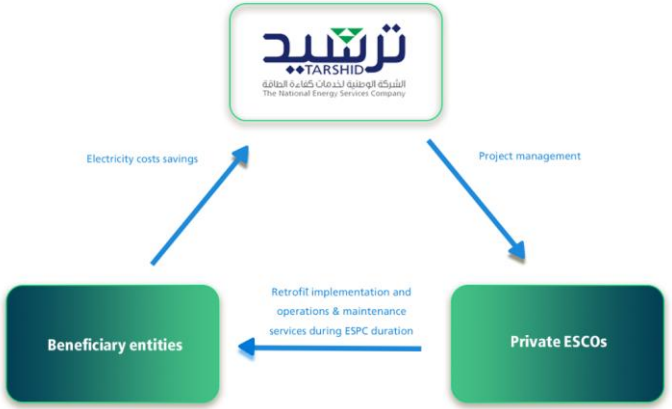
Source: World Bank Live Wire on Super ESCOs, 2018

Etihad ESCO (in UAE)



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

Tarshid (in Saudi Arabia)



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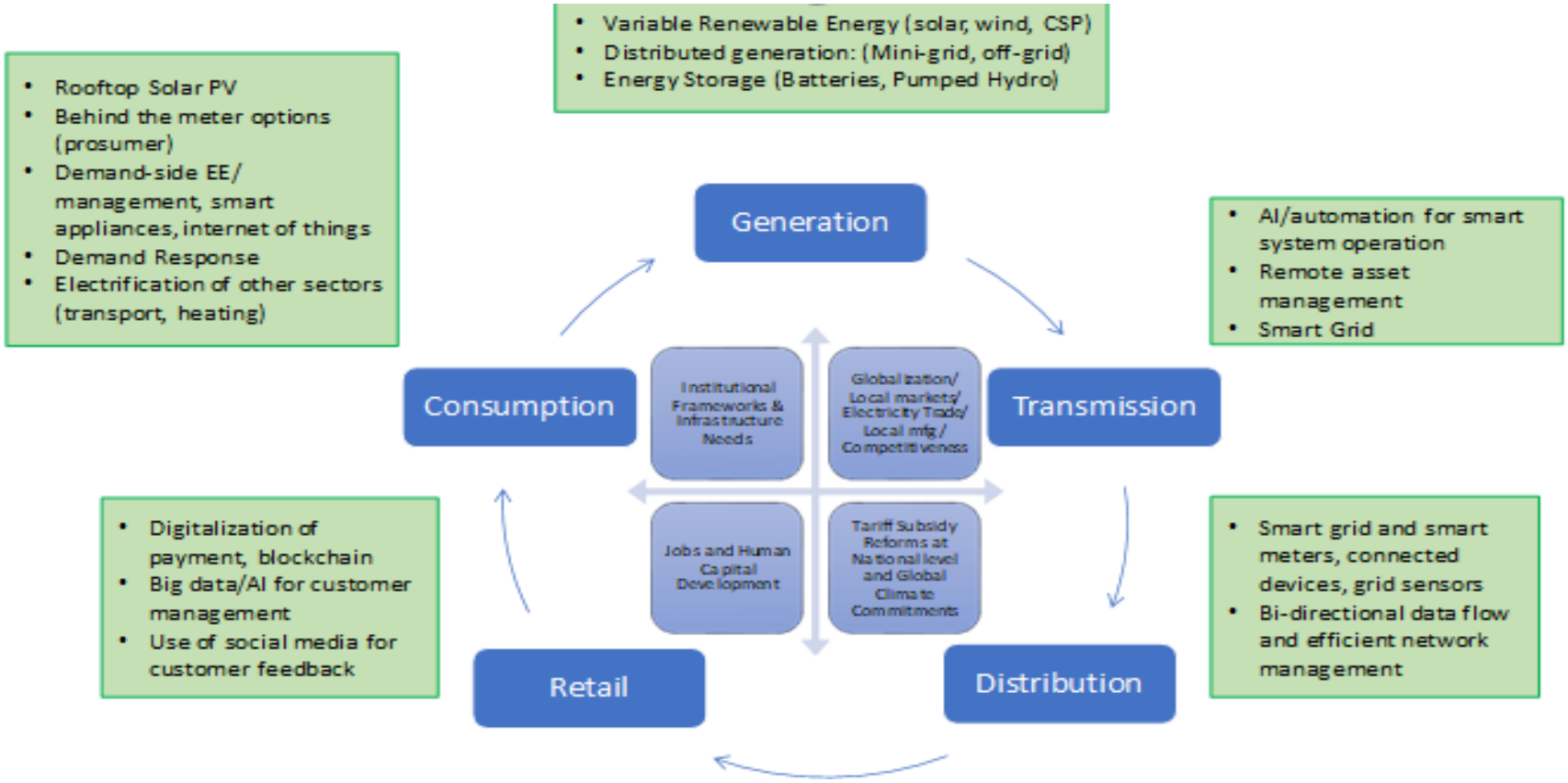
EE Financing and Business Models Are Evolving

The Five MegatrenDs:

Disruption (Demand Disruption), Decarbonization, Distribution/Decentralization, Democratization, Digitalization



Source: World Bank (2019) "MENA Clean Energy Transition and Jobs" Concept Note

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VEF Presentation, April 2021

Thank You

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