Business models for energy efficiency - Energy Performance Contracting

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Outline

- The benefits and driving factors of energy efficiency
- The business models of energy performance contracting
- Our related on-going work - the Global ESCO Network

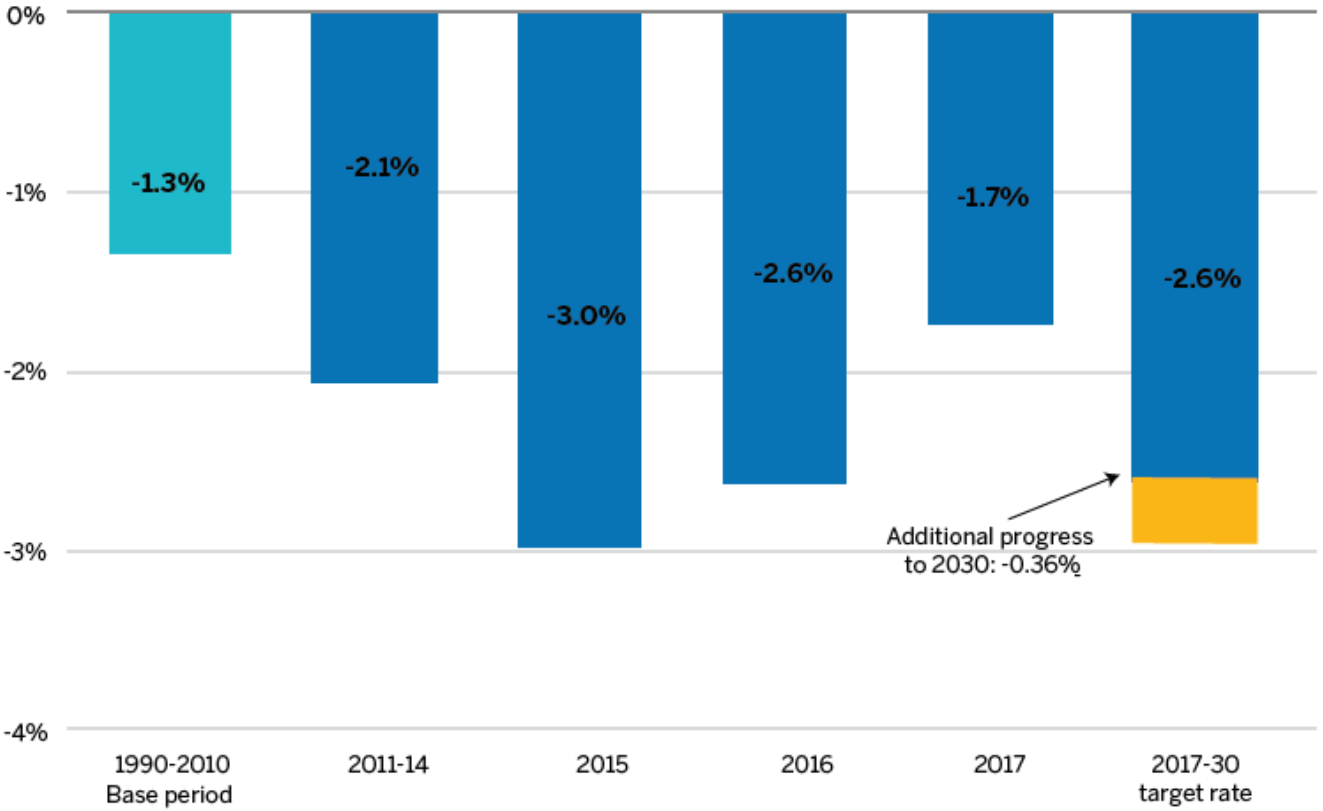
The multiple benefits of energy efficiency

- Energy efficiency simply means using less energy to perform the same task – that is, eliminating energy waste.
- Energy efficiency brings a variety of benefits: reducing greenhouse gas emissions, reducing demand for energy imports, and lowering our costs on a household and economy-wide level.
- Improving energy efficiency is often the cheapest – and often the most immediate – way to reduce the use of fossil fuels.
- There are enormous opportunities for efficiency improvements in every sector of the economy using existing technologies.
- The SDG 7 - Ensure access to affordable, reliable, sustainable and modern energy for all sets the target of doubling the global annual rate of energy efficiency improvement by 2030, i.e. from 1.3% to 2.6% per year.

Materialize the EE opportunities requires huge investment, especially from the private sector

- The average annual rate of improvement in global primary energy intensity during 2010 - 2017 was 2.2%, more than the 1.3% during 1990 - 2010. To reach the SDG 7.3 target (by doubling the historic improvement trend), the annual improvement to 2030 would need to average 3% between 2017 and 2030.

Changes in global primary energy intensity

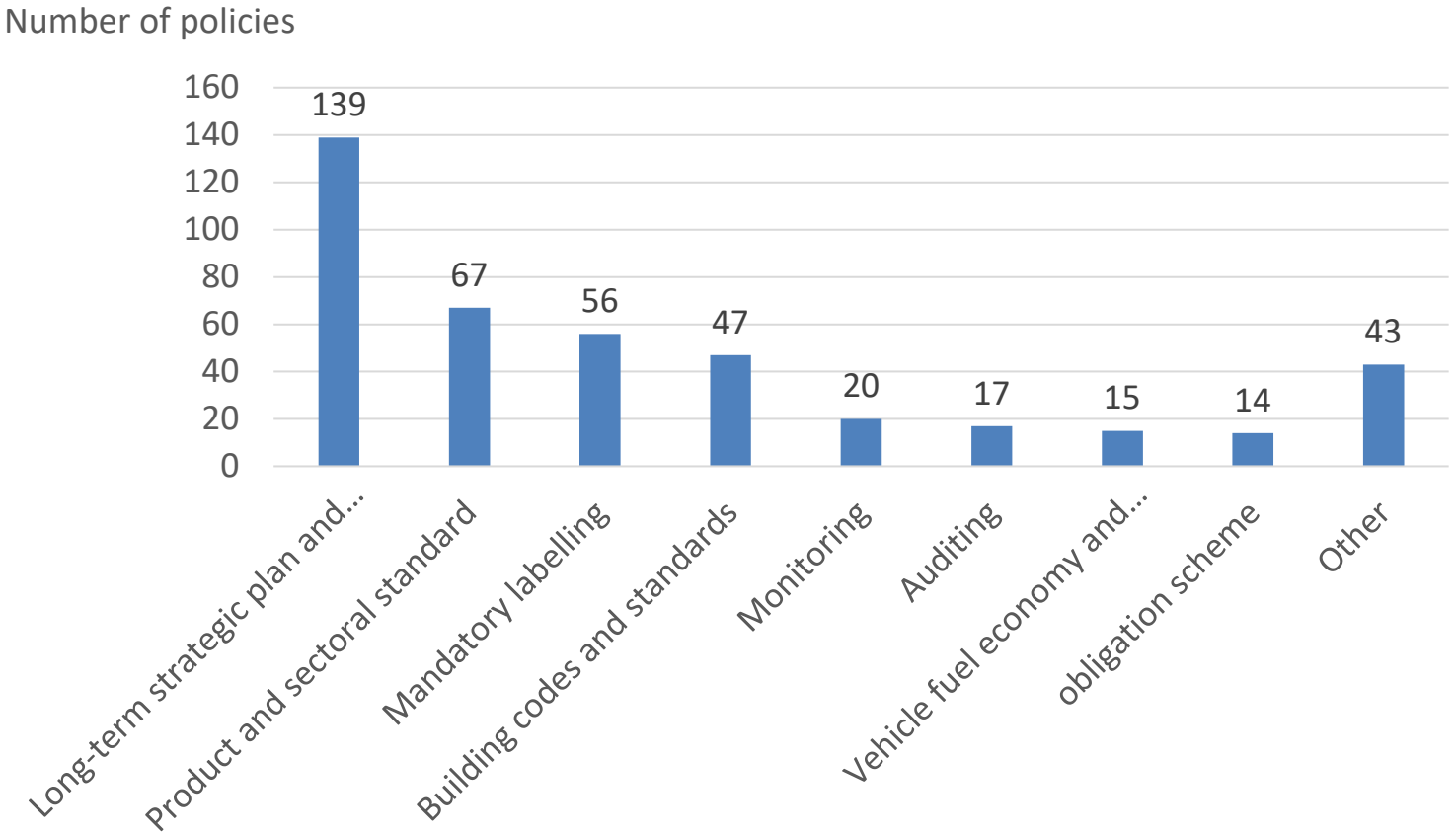


Source: *Tracking SDG 7 - the Energy Progress Report 2020*

Key driving factors for Energy efficiency improvement

- Technologies
- Policies
- Investment
- Consumer behaviours, lifestyle

Types of energy efficiency policies found in 106 developing countries (as of end 2015)



Business models

"A business model is supposed to answer who your customer is, what value you can create/add for the customer and how you can do that at reasonable costs."

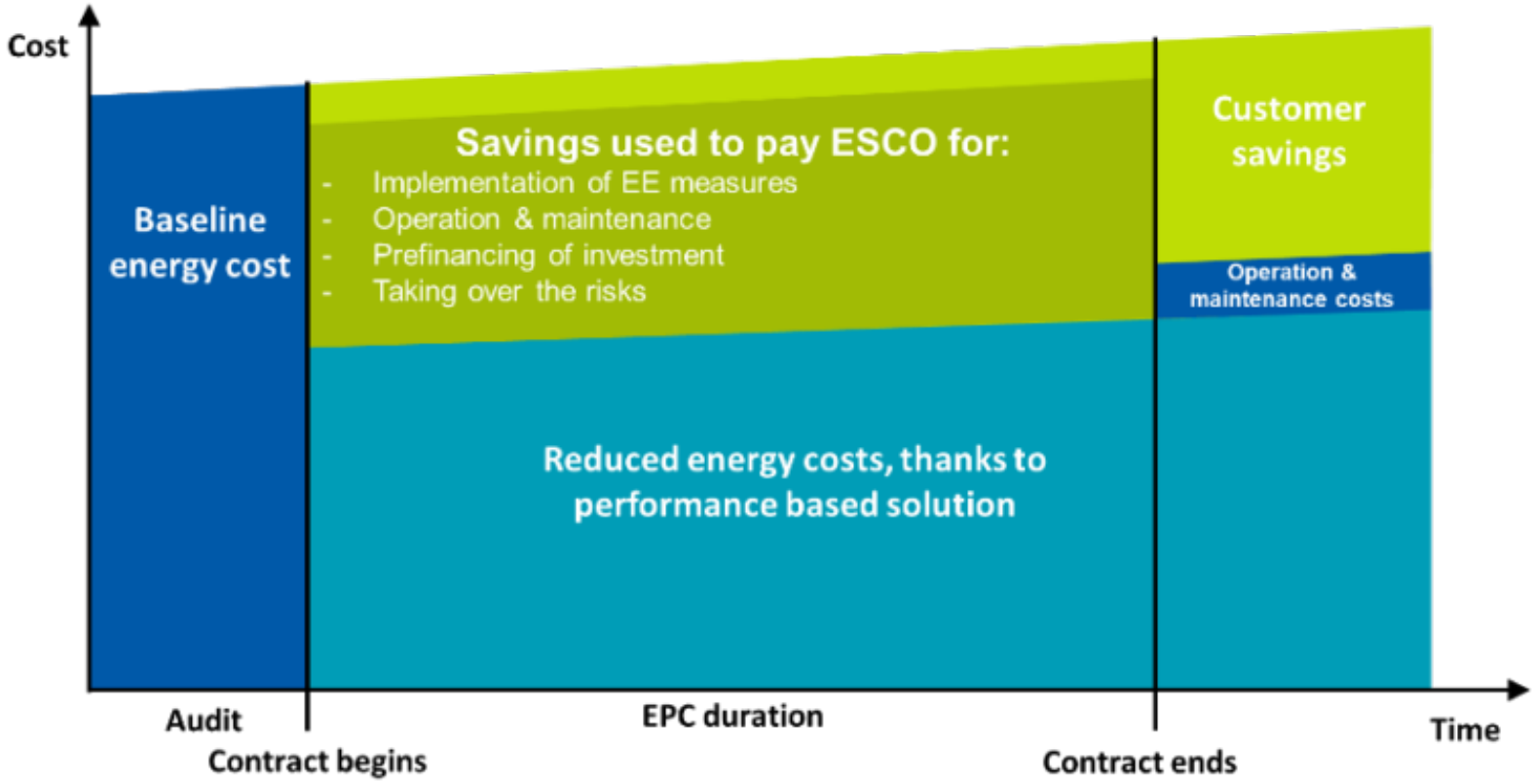
-- Peter Drucker

- Multiple enterprises produce and market energy efficient products, equipment, and services like energy audit /energy management
- Skilled professionals and workers: like architects, construction workers, carpenters, electricians…
- **An ESCO** is a commercial business providing a range of energy solutions including design and implementation of projects focused on energy savings, retrofitting and energy conservation.
- ESCOs first appeared in the US in the early 1980s and have been developing around the work, the biggest ESCO markets are in China, US, and EU.

Energy performance contracting (EPC)

EPC is a financial mechanism used to **pay for today's facility upgrades with tomorrow's energy savings** – without tapping your organization's capital budget.

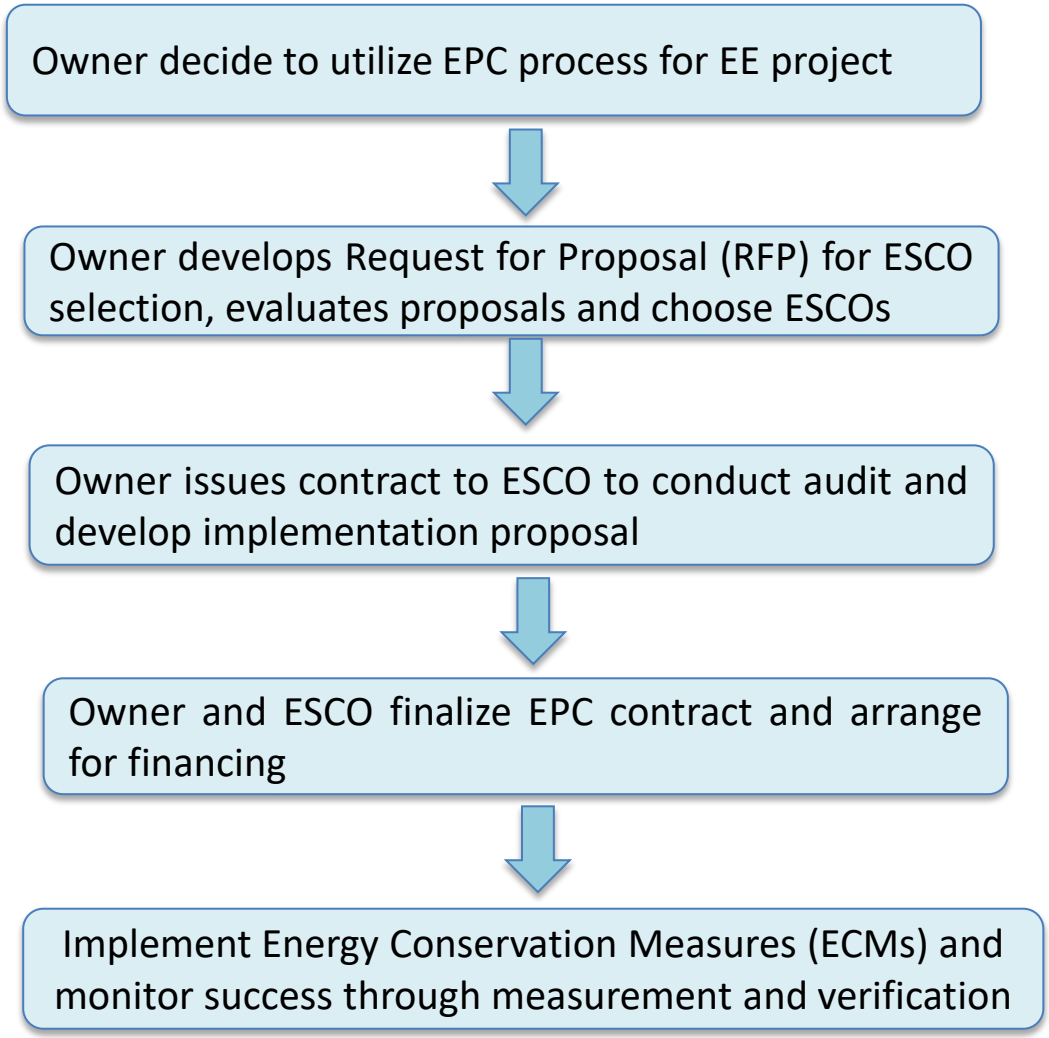
An EPC constitutes a partnership between a facility owner and an energy service company (ESCO), and is considered a time and cost-effective method for completing comprehensive energy upgrades.



The IEA overview on the global ESCO market

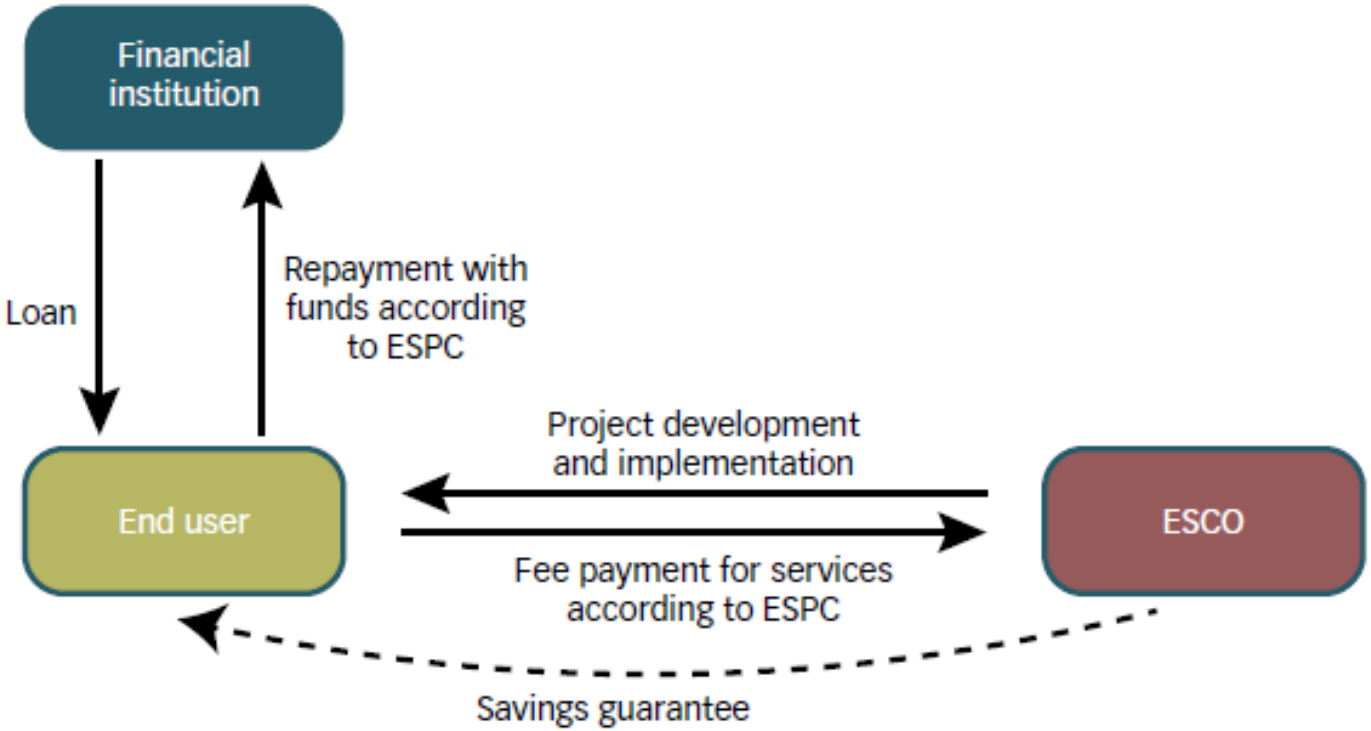
- The value of the global ESCO market grew 8% to **USD 28.6 billion in 2017**, of which USD16.8 bn in China (59%). The market in the US, where ESCOs have been operating for well over 30 years, grew to USD 7.6 billion in 2017 (26%). In Europe, the ESCO market remains somewhat underdeveloped compared to other major regions, representing 10% of the global total.
- On average, ESCO projects are delivering energy savings upwards of 25%.
- The majority of ESCO projects takes place in the **non-residential buildings sector, followed by industry**, very few projects in the transport sector.
- **Subsidiary ESCOs** are typically a small branch of a larger engineering firm or technology provider, such as Honeywell, Siemens, or Schneider Electric operating in a mature market which allows for project aggregation. In this case, ESCO services may have access to equity to finance a project, or might have an easier time borrowing due to a high credit rating.
- **A standalone ESCO** is generally 20-50 employees, solely focused on delivering energy savings measures. These companies often possess different financing capabilities due to their smaller size.

EPC - the main steps



ESCO business model - Guaranteed saving

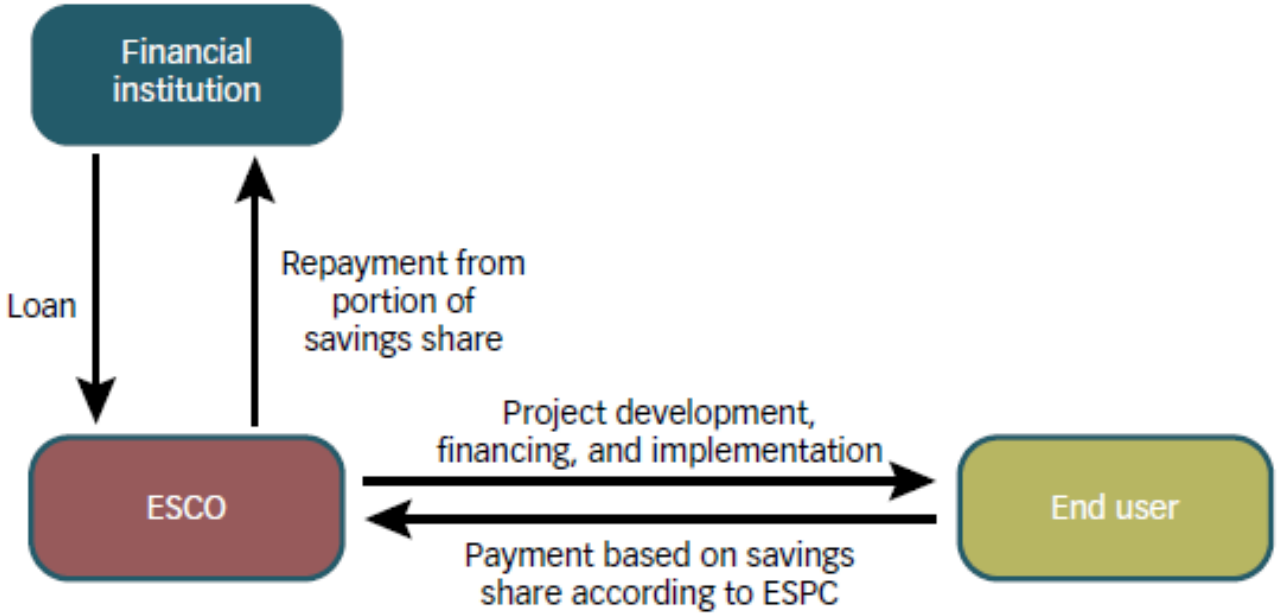
- ESCO takes only the performance risk



World Bank, 2018. *Transforming Energy Efficiency Markets in Developing Countries: The Emerging Possibilities of Super ESCOs*

Shared-saving business model of ESCOs

ESCOs take both performance and credit risks

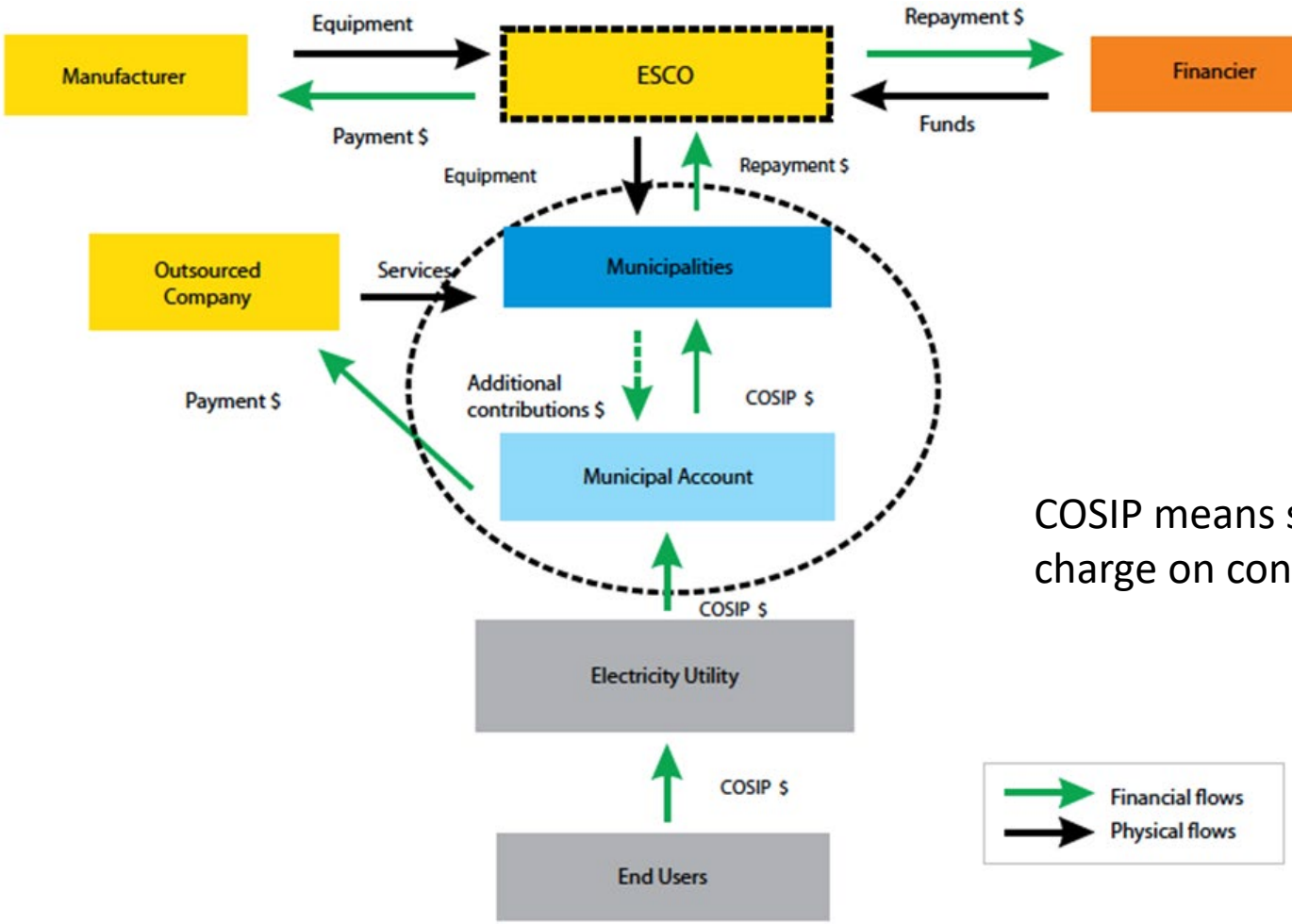


World Bank, 2018. *Transforming Energy Efficiency Markets in Developing Countries: The Emerging Possibilities of Super ESCOs*

Pay-as-you-save model (PAYS)

Getting efficient energy using devices or equipment, such as CFL/LED bulbs and electrical appliances to the users; the users continue pay the agreed electricity bill for certain period of time; upon end of the period, the devices/equipment ownership is transferred to the users

Example structure of the ESCO model for public lighting



COSIP means street lighting charge on consumers bill.

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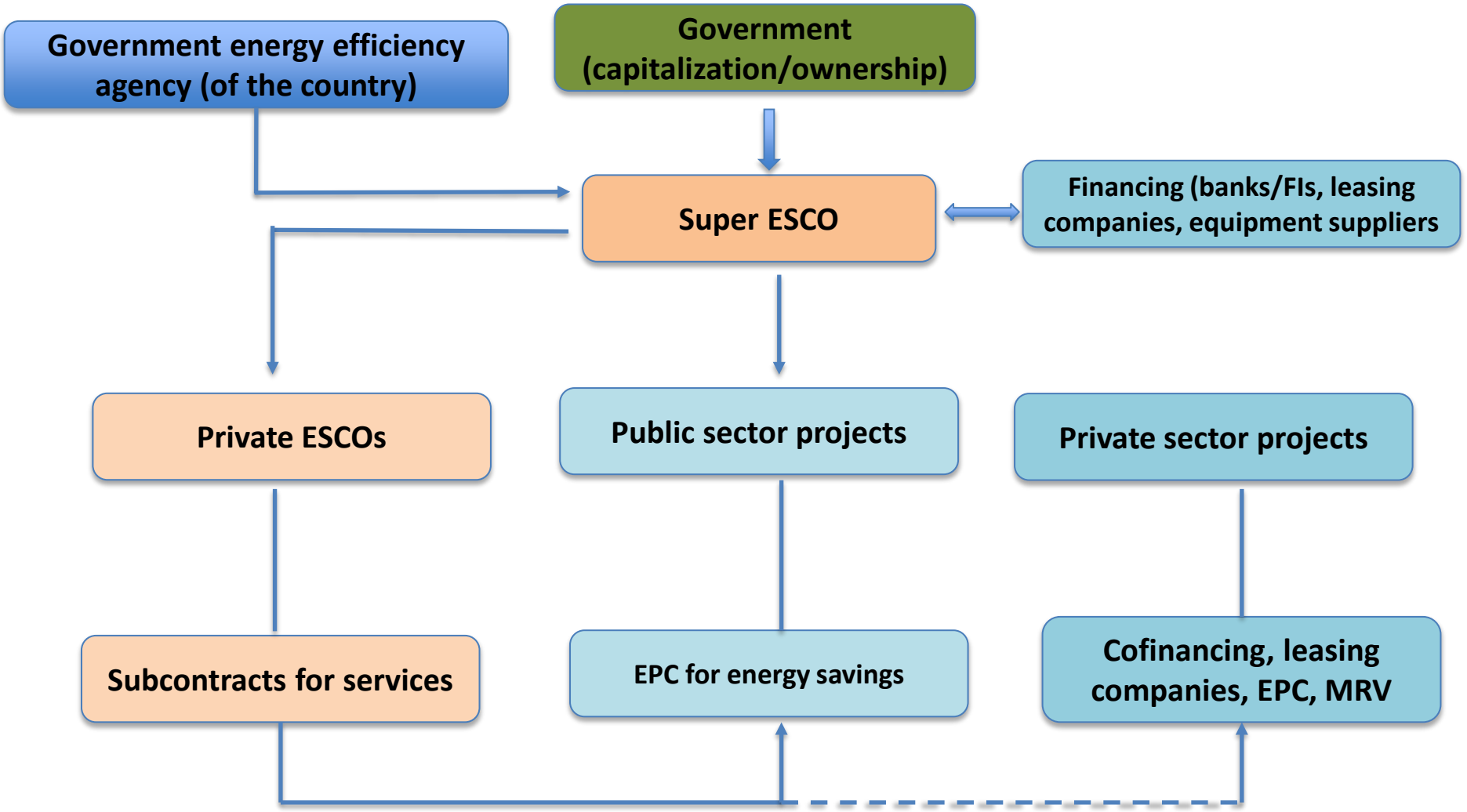
ESMAP, 2017. *Lighting Brazilian Cities: Business Models for Energy Efficient Public Street Lighting*. Washington, D.C.

Super-ESCO model

- Government backed super ESCO, one good example is EESL (Energy Efficiency Service Limited) from India.
- EESL is promoted by Ministry of Power, India as a Joint Venture of four reputed public- sector undertakings.
- Its main business model is large-scale public purchase of efficient bulbs, air conditioners, water pumps, e-mibility etc. and implementation of EE retrofitting projects.
- Due to its government backing, EESL is able to get hundreds of millions of USD funding from ADB, KfW, AfD, and the World Bank for energy efficiency activities; it also gets substantial funding from the Indian government.
- UAE, Thailand,

- Recently, EESL, a company in the UK and a Kenya company are proposing the business model of "ESCO in a box".

An illustrative model of a Super ESCO



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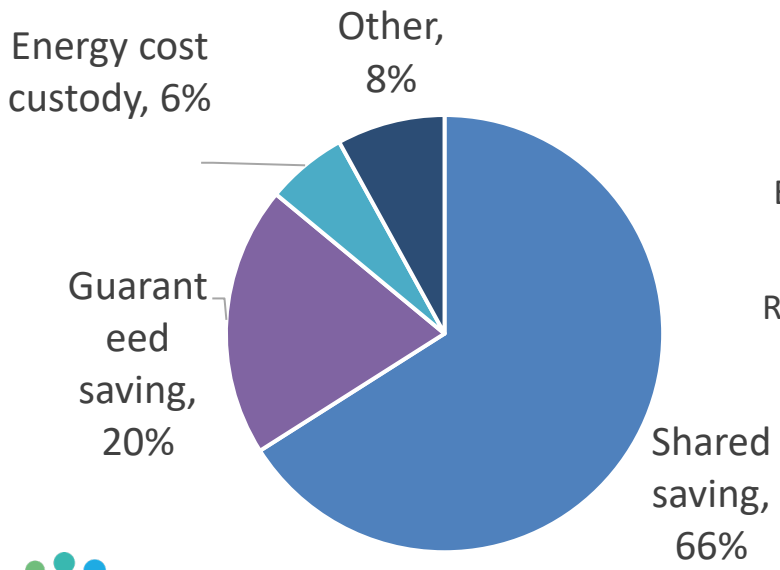
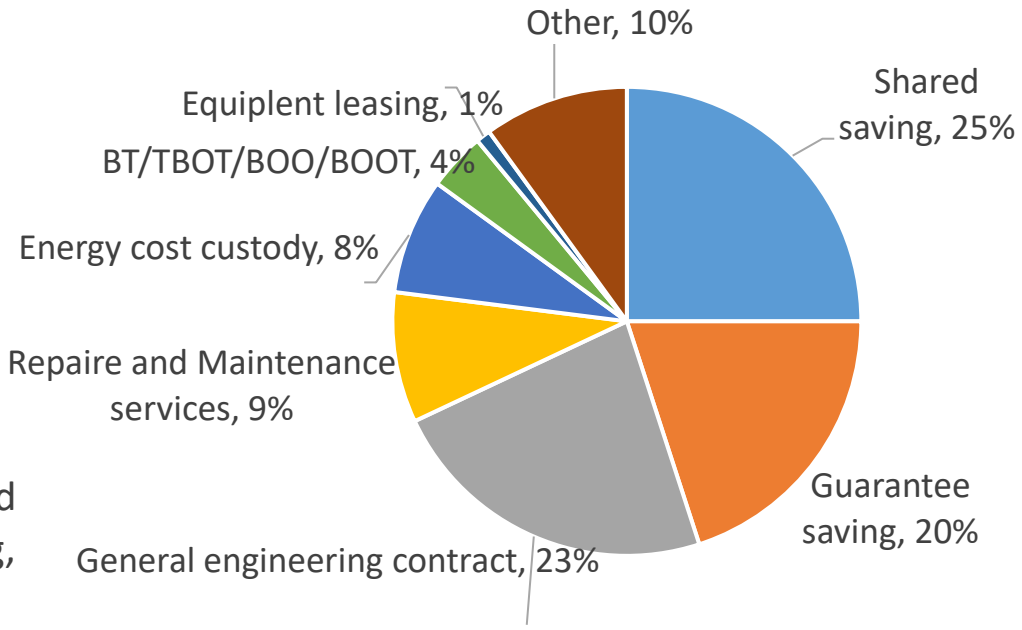
‘Chauffage’ contract

Another type of contracts where ESCOs often engage in is known as the ‘chauffage’ contract, where an ESCO takes over complete responsibility for the provision to the client of an agreed set of energy services (e.g. space heat, lighting, motive power, etc.), for a fixed amount of payment which does not depend on the energy performances.

Business models of ESCO market in China, 2012



Business models of ESCO market in China, 2019



Data source: China ESCO Association (EMCA)

Common barriers to EPC development

- **Awareness and information:** Lack of information on the complexity of the ESCO concept, leading to distrust by end-users and also by financial institutions.
- **Legal and political barriers**: Erratic legislation; lack of generally accepted ESCO definition; certification and standards; ambiguous legislation; problematic procurement rules.
- **Institutionalization and project tools**: Lack of facilitators; lack of proper M&V practices; savings predictability issues.
- **Financing barriers**: Accounting of EPC projects as loans by public authorities; problems with bank financing (low awareness and motivation to finance ESCO projects); aversion to loans by potential ESCO clients and high transaction costs.
- **Market and partnerships problems**: Low energy prices; high perceived risks; lack of well-established partnerships; failed projects.
- Lack of common understanding of Measurement and Verification protocols
- **Behavioural barriers**: Client risk aversion about EPC models; preferred in-house solutions; unwillingness to take on long-term debt.

What governments can do to promote EPC and ESCO development?

- Awareness raising and capacity building
- Preferential tax and subsidies for EPC projects
- Clear guidelines and standards on measurement and verification related to EPCs
- Using EPCs in the energy efficiency renovation and retrofitting of public buildings and facilities, like street lighting and water supply
- Supportive financing policies, like bank loans for EPC projects, guarantees, and insurance products for EPC projects, markets for the transaction of EPCs
- Training and accreditation of professionals, like energy auditors and energy managers, and accreditation of ESCOs based on their qualifications and credit level (US and China).

Global ESCO Network

The **Global ESCO Network** intends to elevate issues and concepts related to ESCOs to the highest possible level on the international climate change agenda.

Key functions:

- Global-scale research and information dissemination about issues relevant to the proliferation of ESCOs;
- ESCO advocacy in global fora for the currency and relevance of the ESCO approach to accelerating climate change mitigation; and
- Coordinated approaches to securing resources and funding for developing policies, training programs, and enabling environments favourable to ESCO market growth.

Structure

- The Global ESCO Network has a Secretariat anchored in the Copenhagen Centre for Energy Efficiency.
- The Global ESCO Network operates without formal membership, but works by associating existing national and regional ESCO associations and global bodies that are related to ESCO sector development.

Global ESCO report:

Currently working on a Global ESCO Perspectives Report - consisting of 10+ articles, each around 5000-6000 words, to be released by the end of this year.

More info https://c2e2.unepdtu.org/global-esco-network/

Sources for more info:

- IEA, https://www.iea.org/reports/energy-service-companies-escos-2
- US Department of Energy, https://www.energy.gov/eere/femp/energy-savings-performance-contracts-federal-agencies
- SEAI (Sustainable Energy Authority of Irealand), 2013, A guide to Energy Performance Contracts and Guarantees.
- US EPA, 2007. ***Introduction to Energy Performance Contracting.*** Prepared by: ICF International National Association of Energy Services Companies for U.S. Environmental Protection Agency ENERGY STAR Buildings.
- World Bank, 2018. *Transforming Energy Efficiency Markets in Developing Countries: The Emerging Possibilities of Super ESCOs.*

Thanks for your attention!

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