Philippines: EE Market Updates

Updates on the Energy Efficiency Law in the Philippines and on the Pioneer Private Super-ESCO Aggregator of ESCO Project Assets

Alexander Ablaza | 3 October 2024 | Taiwan International ESCO Seminar, Taipei Nagang Exhibition Center

Providing context

Which hats am I wearing?

ALEXANDER ABLAZA

Principal Advisor
Energy Efficiency – Finance, Investments, Policy and Market Transformation
Sustainable Infrastructure and Climate Finance

- Supported the design, due diligence, preparation and financial close of over USD 3 billion in energy efficiency other clean energy investments across developing Asia
- Served as ADB's bank-wide energy efficiency anchor expert, coordinating ADB's Clean Energy Program and Energy Efficiency Initiative, and as Asia-lead for IFC/World Bank Group's Global Climate Finance Team
- Led efforts to develop and enact energy efficiency policies in China, Vietnam and the Philippines
- Led energy efficiency market transformation programs and market assessments in Southeast Asia
- Designed the pioneer PPP transaction for energy efficiency in Asia (State of Melaka Streetlighting)
- Experience and advisory scope spans 17 economies in Asia and the Middle East

PE2 convenes a wider range of energy efficiency market stakeholders to sustain a long-term market transformation

www.pe2.org

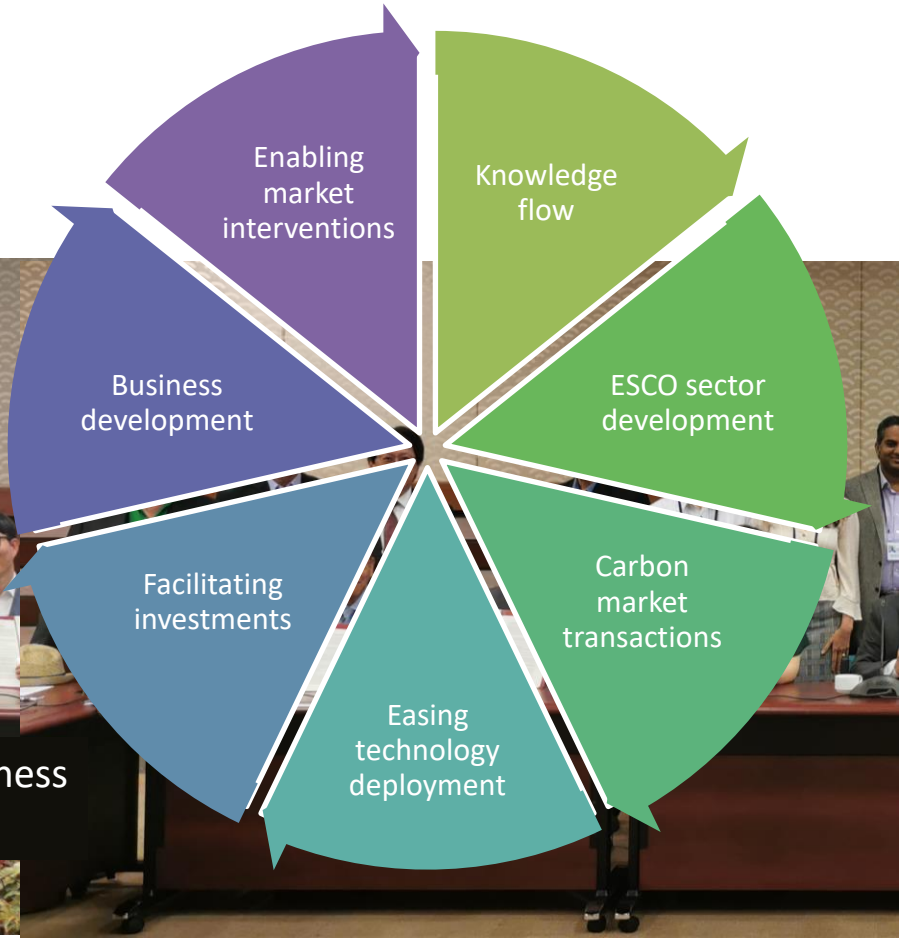
PE2

PHILIPPINE ENERGY EFFICIENCY ALLIANCE, INC.

APEIA

Asia-Pacific ESCO Industry Alliance

A regional platform intended to facilitate the flow of knowledge, capacity building and business development resources with the end goal of growing ESCO markets in Asia-Pacific



China | India | Indonesia | Japan | Korea | Malaysia | Philippines | Singapore | Taiwan | Thailand

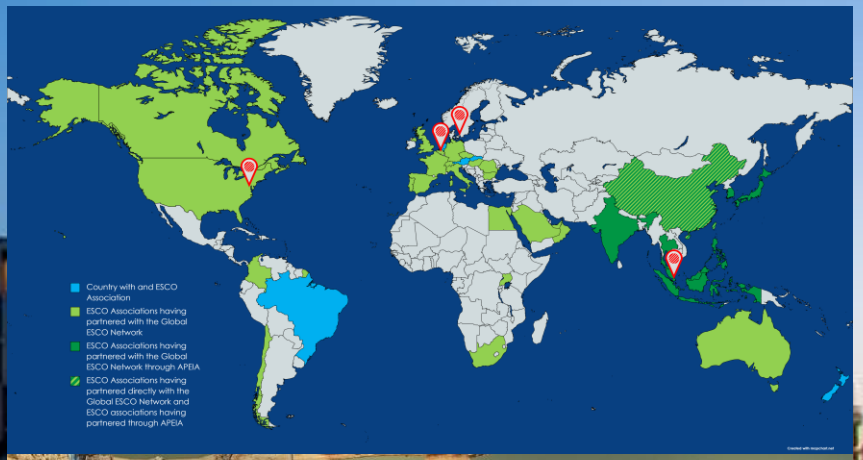
Global ESCO Network

The **Global ESCO Network** gathers ESCO associations of the world as well as international institutions and ESCO experts for the promotion of ESCOs and Energy Performance Contracting in response to the global climate change challenge and the goals set out by the Paris Agreement.

It is the **Vision** of the Global ESCO Network **to be the global driver and inspire government actions for scaling up the contribution of ESCOs to the global response for mitigating the threat of climate change and the goals set out by the Paris Agreement**. To realize this, it is the **Mission** of the Global ESCO Network **to add to and reinforce existing efforts of National and Regional ESCO Associations to promote increased activities by the ESCO Sector at a global scale**.

The Global ESCO Network **recognizes the regional role of APEIA** as convenor of ESCO associations under its membership and will work through APEIA to advance the Network's objectives in the Asia-Pacific region.

The Global ESCO Network has its Secretariat anchored in the **UNEP Copenhagen Climate Centre** and the **Efficiency Valuation Organization (EVO)**.



Mission Efficiency is a global collective of actions, commitments and goals on energy efficiency by a coalition of governments, organizations and initiatives. Energy efficiency represents the largest share of cost-effective actions to achieve the Paris Agreement. Mission Efficiency unites these partners and actions to accelerate the transition towards energy efficient economies worldwide.

Learn more at missionefficiency.org

Mission Efficiency

Elevate. Support. Invest.

Photo: Energy efficiency financing charette hosted at the UNEP Copenhagen Climate Centre, June 2022

Among the world's firsts in private sector ESCO project portfolio investments

Asia's pioneer private Super-ESCO aggregator of ESCO project assets in emerging markets

Equity and Debt Partners

Climargy

Project / Portfolio Vehicles

- **ESCO / Tech Providers**
  - Host Entity/ End-user
  - Energy Efficiency Project
- **ESCO / Tech Providers**
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- **ESCO / Tech Providers**
  - Host Entity/ End-user
  - Energy Efficiency Project

Climargy's unique market position as the **pioneer and lone equity vehicle** for off-balance sheet capital to energy management projects of the Philippine C/I energy end-use market **catalyzes private equity and debt flow and even developmental grants to the sector**

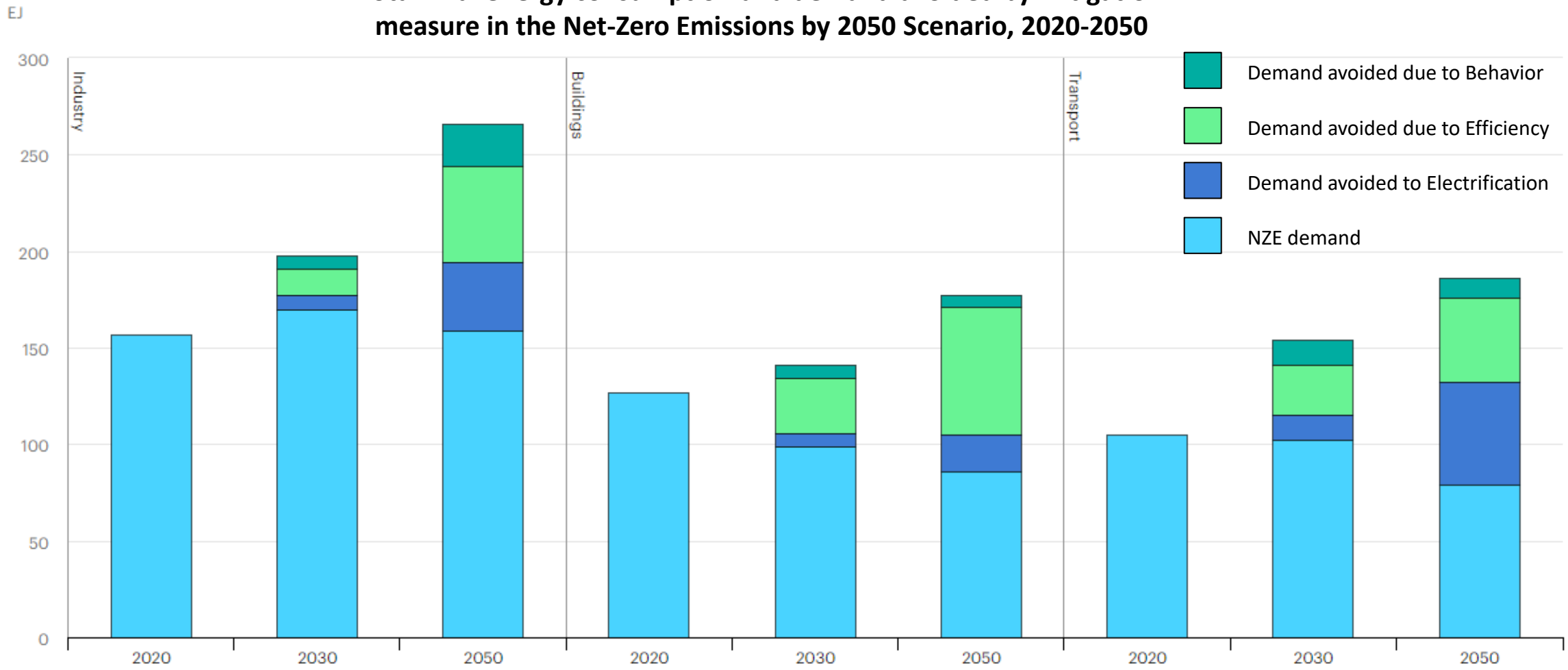
EE policy updates

EE growing with inclusivity

IEA: Energy efficiency is a critical component of Net Zero

IEA's Net-Zero Emissions by 2050 (NZE) Scenario – global energy demand in 2050 to be around 8% lower than today but will need to serve an economy more than twice as big and a population with 2 billion more people.

Total final energy consumption and demand avoided by mitigation measure in the Net-Zero Emissions by 2050 Scenario, 2020-2050



Source: IEA, Jun 2021

Philippines: Economic and development impacts of reducing 182 Mtoe in final energy consumption through EE&C by 2040

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Economic

- PHP 36 trillion in end-use savings
- Reduced dependence on imported fossil fuels
- Incremental GDP growth
- 9 million green jobs
- Over 500% Gov't recovery of fiscal incentives through additional tax revenues

Energy Security

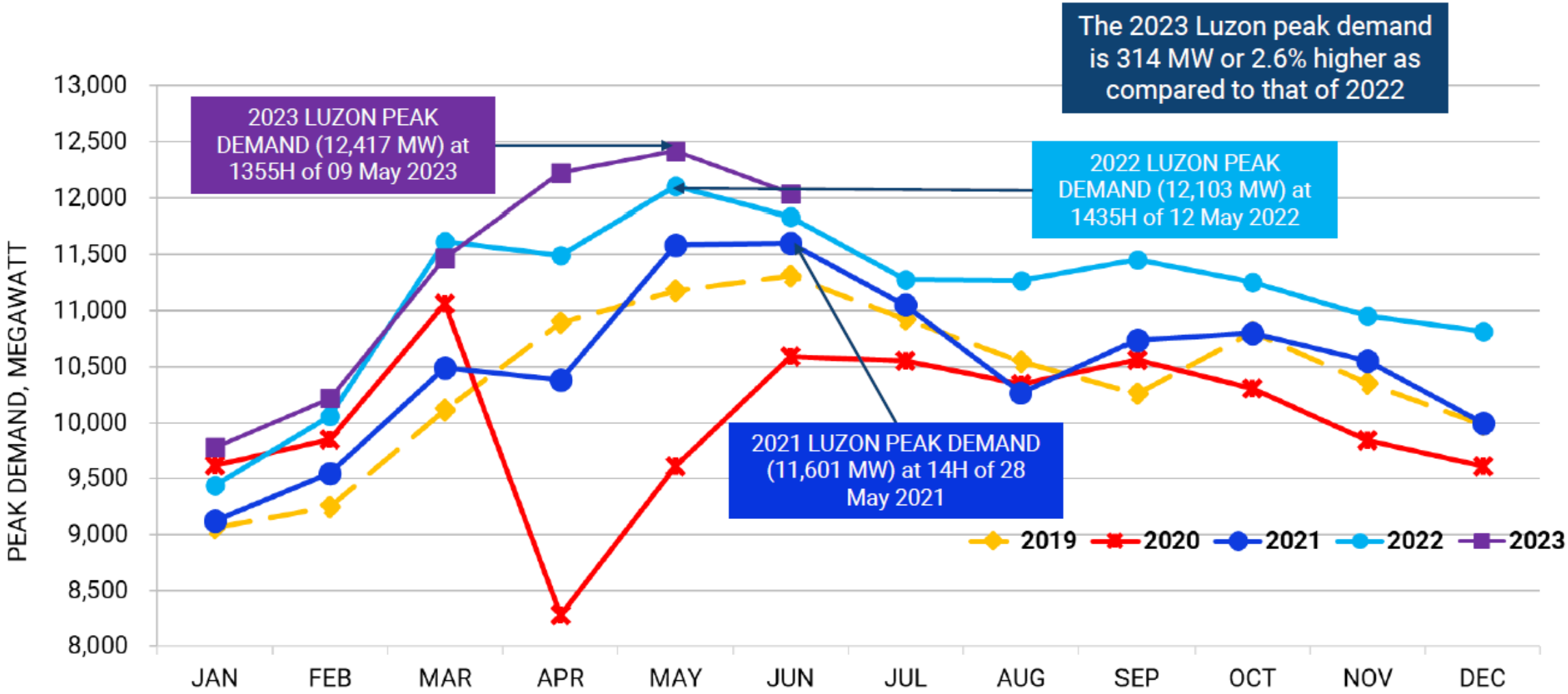
- 45,900 MW deferred energy infrastructure capital requirements for energy production, transmission and distribution
- Decelerated rise in energy prices

Climate Change Mitigation

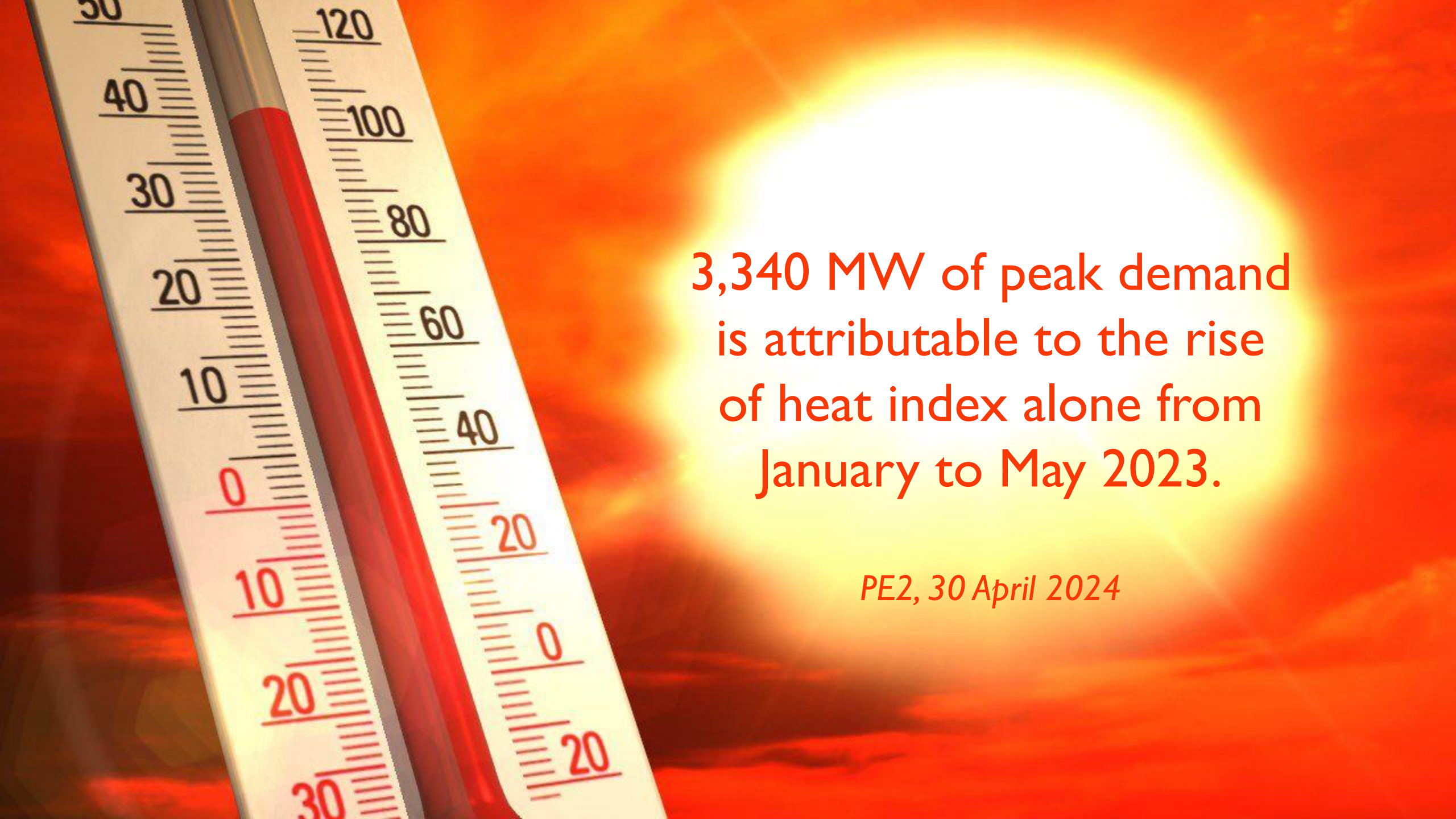
- Up to 1.7 GtCO2e in greenhouse gas emission reduction
- Contributing to Paris climate agreement obligations
- Attracts climate funding

Source: A. Ablaza, 2023

Grid peak demand exceeds pre-pandemic levels



Source: IEMOP Market Operational Highlights, 15 June 2023


3,340 MW of peak demand is attributable to the rise of heat index alone from January to May 2023.
PE2, 30 April 2024

Philippines: Through NEECP and Roadmap 2023-2050, the country now has short-, medium- and long-term EEC emission reduction targets

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- The National Energy Efficiency and Conservation Plan (NEECP) is a national framework to institutionalize the EEC Act as well as define and outline all EEC programs to be implemented, their objectives and associated emission reduction targets over various time horizons.
- The revised Philippine Energy Efficiency and Conservation Roadmap 2023-2050 provides an updated outline of the strategic plans and actions for EEC in the Philippines across all sectors, including implementing key provisions of the EEC Act, and its accompanying Implementing Rules and Regulations (EEC-IRR).

Sector	Programs	Short-Term Emissions Savings (2023 – 2024)	Medium-Term Emissions Savings (2025 – 2028)	Long-Term Emissions Savings (2029 – 2050)
Government	Government Energy Management Programs (GEMP)	1.87 Mt CO2e 16.15%	3.31 Mt CO2e 15.81%	25.06 Mt CO2e 14.48%
Commercial	Philippine Energy Labeling Programs (PELP) /Minimum Energy Performance for Products (MEPP)	7.51 Mt CO2e 16.15%	13.28 Mt CO2e 15.81%	100.50 Mt CO2e 14.48%
Residential	PELP/MEPPs	18.56 Mt CO2e 34.65%	32.79 Mt CO2e 31.66%	248.21 Mt CO2e 23.17%
Industrial	PELP/MEPPs	17.43 Mt CO2e 19.38%	30.81 Mt CO2e 19.17%	233.18 Mt CO2e 18.35%
Transport	Fuel Efficiency Standards (under PELP)	Pending data	Pending data	Pending data
	Electric Vehicle and Charging Stations (EVCS)	Pending data	Pending data	Pending data
	10% EV penetration by 2040	N/A	N/A	116.54 Mt CO2e 8.22%
Utilities & End use	Power Sector Efficiency	4.34 Mt CO2e 27.95%	7.53 Mt CO2e 27.95%	54.03 Mt CO2e 27.95%

Source: DOE, NEECP and Roadmap 2023-2050

Republic Act No. 11285
Energy Efficiency and Conservation Act

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Government

- DOE is lead agency
- NGAs, GOCCs, GFIs and LGUs have new roles
- Inter-Agency EE&C Committee, GEMP and Govt EE Projects

Certification

- Certified EE&C Officer
- Certified Energy Manager
- Energy Service Company (ESCO) Certification

Energy Performance

- Minimum Energy Performance and Labeling
- DOE Examination, Testing and Verification
- Energy Performance of Transport Vehicles and Buildings

Designated Establishments

- Type 1: 0.5-4.0 million kWh/yr
- Type 2: > 4.0 million kWh/yr
- Reporting of Other Establishments: 0.1-0.5 mln kWh/yr
- DOE Visitorial Powers

Incentives

- Fiscal Incentives
- Non-fiscal Incentives
- Concessional Finance

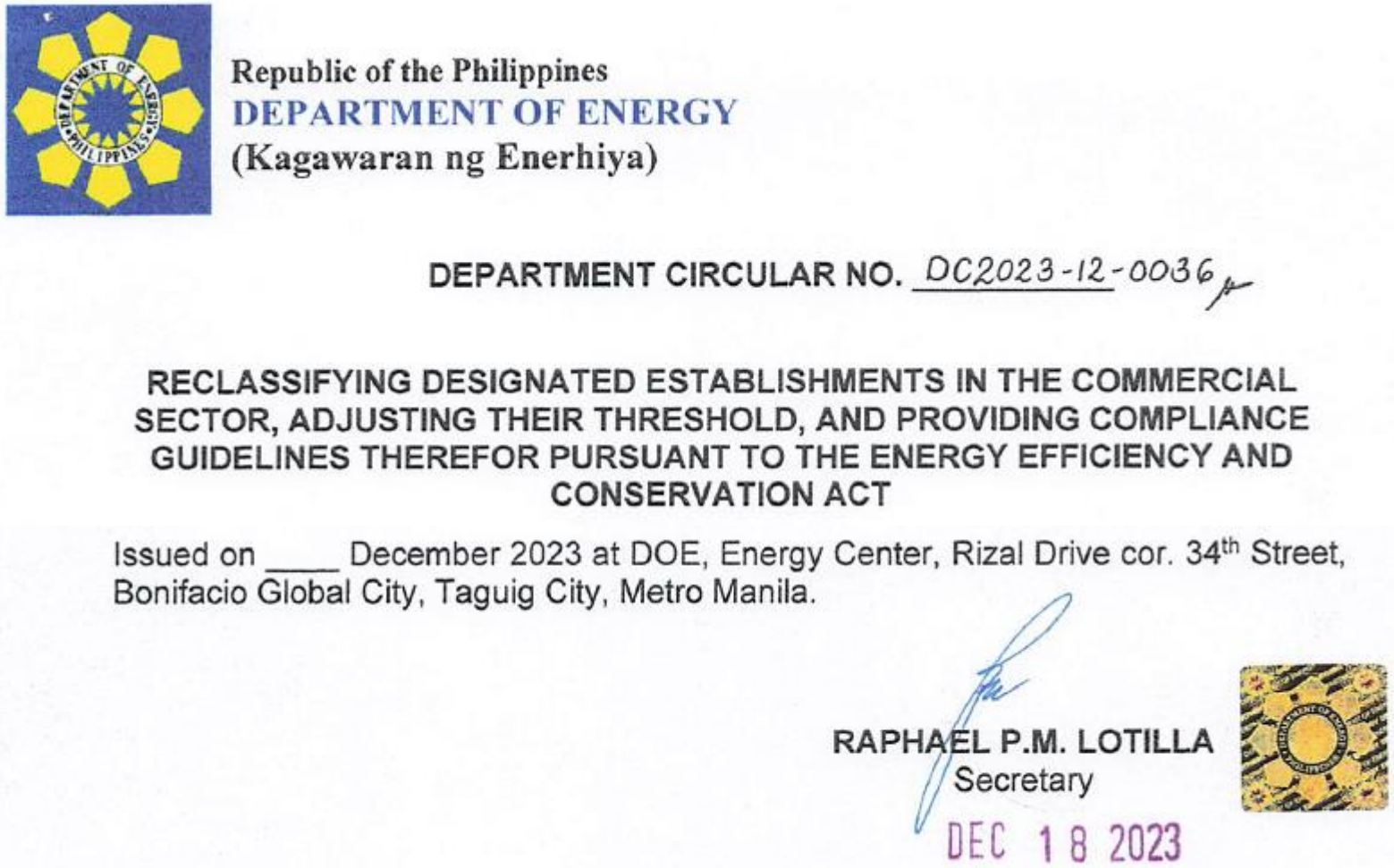
Other Features

- Demand-side Management (DOE, ERC, PEZA)
- Waste Management
- DOE-EUMB Strengthening
- Prohibited Acts, DOE Measures, Penalties, Fines and Liability
- Appropriations, IRR, Codes, Guidelines, JCEC Oversight

Source: A. Ablaza, 2019

DOE Department Circular Nos. DC2023-12-0036 (Commercial), DC2023-12-0037 (Industrial) and DC2023-12-0038 (Transport)

Reclassifying Designated Establishments in the Commercial, Industrial and Transport Sectors, Adjusting their Threshold, and Providing Compliance Guidelines Therefor Pursuant to the Energy Efficiency and Conservation Act



Republic of the Philippines
DEPARTMENT OF ENERGY
(Kagawaran ng Enerhiya)

DEPARTMENT CIRCULAR NO. DC2023-12-0036

RECLASSIFYING DESIGNATED ESTABLISHMENTS IN THE COMMERCIAL SECTOR, ADJUSTING THEIR THRESHOLD, AND PROVIDING COMPLIANCE GUIDELINES THEREFOR PURSUANT TO THE ENERGY EFFICIENCY AND CONSERVATION ACT

Issued on ____ December 2023 at DOE, Energy Center, Rizal Drive cor. 34th Street, Bonifacio Global City, Taguig City, Metro Manila.

RAPHAEL P.M. LOTILLA
Secretary

DEC 18 2023

- Repeals DOE Memorandum Circular No. MC2020-05-0001
- Published at: Business World, The Philippine Star on 27 Dec 2023.
- Effective 15 days after publication

DOE Department Circular Nos. DC2023-12-0036 (Commercial) and DC2023-12-0038 (Transport)

Classification of DEs in the Commercial Sector / Transport Sector

- Single-address DEs (SADE)
- Consolidated DEs (CDE)

Typology	Annual fuel and electricity consumption (previous year)	Submit Annual EEC Report (AEECR) and Annual Energy Utilization Report (AEUR) through DE Online Submission Portal?
Other DEs	50,000 kWh equivalent and below	Optional / Encouraged
Type 1	50,001 kWh equivalent to 500,000 kWh equivalent	Mandatory
Type 2	500,001 kWh equivalent to 4,000,000 kWh equivalent	Mandatory
Type 3	4,000,001 kWh equivalent or more	Mandatory

DOE Department Circular No. DC2023-12-0037 (Industrial)

Classification of DEs in the Industrial Sector

- Single-address DEs (SADE)
- Consolidated DEs (CDE)

Typology	Annual fuel and electricity consumption (previous year)	Submit Annual EEC Report (AEECR) and Annual Energy Utilization Report (AEUR) through DE Online Submission Portal?
Other DEs	50,000 kWh equivalent and below	Optional / Encouraged
Type 1	50,001 kWh equivalent to 1,000,000 kWh equivalent	Mandatory
Type 2	1,000,001 kWh equivalent to 8,000,000 kWh equivalent	Mandatory
Type 3	8,000,001 kWh equivalent or more	Mandatory

DOE Department Circular No. DC2023-12-0036 (Commercial)

Identify and assign certified energy efficiency practitioners

Establishment of Building Energy Index (BEI)

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Typology	Required Energy Efficiency Practitioner	Recommended Support Staff
Other DEs	None	None
Type 1	Certified Energy Manager (CEM)	Certified Energy Conservation Officer (CECO)
Type 2		
Type 3		CEM and/or CECO

$$BEI = \frac{(TBEC - NAC - DCEC)}{(GFA - CPA - DCA) - (GLA \times FVR)} \times \frac{AWH}{WOH}$$

Where:

BEI	=	Total energy consumed in a building in a year, expressed as kWh per gross floor area (m^2)
TBEC	=	Total year building energy consumption (kWh/year)
NAC	=	Annual energy consumption of non-airconditioned areas (parking, storage areas, etc.) (kWh/year)
DCEC	=	Data center energy consumption (kWh/year)
GFA	=	Gross floor area (m^2)
CPA	=	Car park area (m^2)
DCA	=	Datacenter area (m^2)
GLA	=	Gross leasable area (m^2)
FVR	=	Floor vacancy rate (%)
AWH	=	Average weekly operating hours (hours/week)
WOH	=	weighted weekly operating hours (hours/week)

DOE Department Circular No. DC2023-12-0037 (Industrial)

Identify and assign certified energy efficiency practitioners

Establishment of Energy Utilization Index (EUI)

Typology	Required Energy Efficiency Practitioner	Recommended Support Staff
Other DEs	None	None
Type 1	Certified Energy Manager (CEM)	Certified Energy Conservation Officer (CECO)
Type 2		
Type 3		CEM and/or CECO

$$\frac{\text{Total Energy Used (kWh)}}{\text{Total Production Output (Unit of Product)}} = \text{Energy Used per Unit of Product}$$

DOE Department Circular No. DC2023-12-0038 (Transport)

Identify and assign certified energy efficiency practitioners

Establishment of Vehicle and Fleet Fuel Economy Performance Rating (FEPR) and Building Energy Index (BEI)

Typology	Required Energy Efficiency Practitioner	Recommended Support Staff
Other DEs	None	None
Type 1	Certified Energy Manager (CEM)	Certified Energy Conservation Officer (CECO)
Type 2		
Type 3		CEM and/or CECO

$$\frac{Total\ Accumulated\ distance\ travelled\ for\ the\ CY\ (a)}{Total\ Accumulated\ Consumed\ Fuel\ for\ the\ CY\ (b)} = Fuel\ Economy\ Performance\ Rating\ (c)$$

Where:

(a) Refers to the accumulated distance traveled for the Calendar Year expressed in the prevailing sectoral unit of measurement (km, miles, nautical miles, etc.)

(b) Refers to the total accumulated consumed energy for the Calendar Year expressed in the prevailing sectoral unit of measurement (liters, gallon, metric tons, kWh, etc.)

(c) Fuel Economy Performance Rating expressed in unit of distance over unit of energy consumption.

$$BEI = \frac{(TBEC - NAC - DCEC)}{(GFA - CPA - DCA) - (GLA \times FVR)} \times \frac{AWH}{WOH}$$

Where:

BEI	=	Total energy consumed in a building in a year, expressed as kWh per gross floor area (m^2)
TBEC	=	Total year building energy consumption (kWh/year)
NAC	=	Annual energy consumption of non-airconditioned areas (parking, storage areas, etc.) (kWh/year)
DCEC	=	Data center energy consumption (kWh/year)
GFA	=	Gross floor area (m^2)
CPA	=	Car park area (m^2)
DCA	=	Datacenter area (m^2)
GLA	=	Gross leasable area (m^2)
FVR	=	Floor vacancy rate (%)
AWH	=	Average weekly operating hours (hours/week)
WOH	=	weighted weekly operating hours (hours/week)

DOE Department Circular Nos. DC2023-12-0036 (Commercial), DC2023-12-0037 (Industrial) and DC2023-12-0038 (Transport)

Submission of Energy Audit Report every 3 years

Conditions	Type 3 / Type 2	Type 1	Other DEs
Compliant with the submission of AEECR and AEUR and with Level 1 Energy Audit Report submitted to the DE Online Submission Portal during the previous compliance period	Level 1 Energy Audit on the next submission then Level 2 Energy Audit for the succeeding compliance periods	Level 1 Energy Audit until further guidance by DOE	Encouraged, but not required, to conduct a Level 1 Energy Audit
Compliant with the submission of AEECR and AEUR and with Level 2 Energy Audit Report submitted to the DE Online Submission Portal during the previous compliance period	Level 2 Energy Audit on the next submission and every succeeding compliance period	Level 1 Energy Audit until further guidance by DOE	Encouraged, but not required, to conduct a Level 1 Energy Audit
Compliant with the submission of AEECR and AEUR but no Energy Audit Report submitted to the DE Online Submission Portal during the previous compliance period	Level 2 Energy Audit on the next submission and every succeeding compliance period	Level 1 Energy Audit until further guidance by DOE	Encouraged, but not required, to conduct a Level 1 Energy Audit
Newly covered entities (those that are consuming less than 100,000 kWh equivalent per year)	--	Level 1 Energy Audit until further guidance by DOE	Encouraged, but not required, to conduct a Level 1 Energy Audit
Not compliant with EEC Act during the previous compliance period	Level 2 Energy Audit on the next submission and every succeeding compliance period	Level 1 Energy Audit until further guidance by DOE	Encouraged, but not required, to conduct a Level 1 Energy Audit

For Types 2 and 3 DEs, energy audits conducted by an in-house Certified Energy Auditor (CEA) shall be subject to the validation of either a DOE-Registered or Certified Energy Service Company (ESCO), CEA or registered Firm, Partnership, Corporation and Sole Proprietorship (FPCS) for energy audit verification.

Type 1 DEs shall be required to conduct a Level 1 or walk-through energy audit in their facilities with a focus on the identified Significant Energy Use. Energy audits may be conducted by an in-house Energy Auditor and shall be accepted by DOE.

DOE Department Circular Nos. DC2023-12-0036 (Commercial), DC2023-12-0037 (Industrial) and DC2023-12-0038 (Transport)

Fines and penalties (USD 1.00 = PHP 56.20, as of 5 Sep 2024)

Violation	Fine: PHP 100,000	Fine: PHP 500,000	Fine: PHP 1,000,000
Failure to submit AEECR and AEUR to DOE	1st Offense	2nd Offense	3rd Offense with endorsement to LGUs for Administrative Sanctions
Forge, alter, counterfeit or falsely make any submission for the purpose of compliance	1st Offense	2nd Offense	3rd Offense with endorsement to LGUs for Administrative Sanctions
Failure to comply with the obligations under Section 66 of the EEC-IRR	1st Offense	2nd Offense	3rd Offense with endorsement to LGUs for Administrative Sanctions
Failure to appoint the proper EE practitioners	1st Offense	2nd Offense	3rd Offense with endorsement to LGUs for Administrative Sanctions
Failure to submit to monitoring, verification, enforcement and post-evaluations	1st Offense	2nd Offense	3rd Offense with endorsement to LGUs for Administrative Sanctions

Pursuant to Section 32 of the EEC Act in relation to Section 83 of the EEC-IRR and without prejudice to fines and penalties, including criminal, under applicable laws.

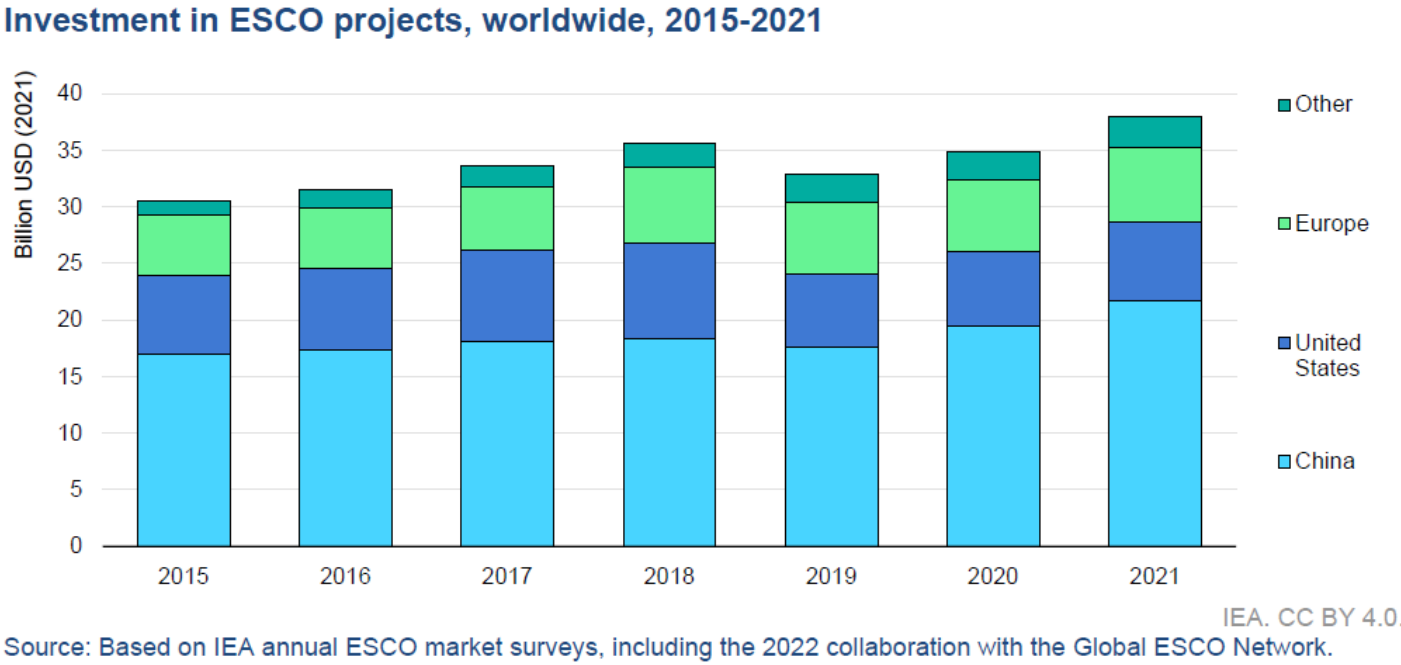
The ESCO market

It's growing!

IEA: ESCO market has been growing steadily since 2015

- The **global ESCO market** increased 9% to **USD 38 billion** in 2021.
- Investment in **China**, the biggest market, grew by 9% to **USD 22 billion**.
- Recent initiatives across the world include innovative and digital business models, and better **project aggregation**, including **portfolio approaches**, service packaging and **Super ESCOs**:
  - Both **Kenya** and **Senegal** have embarked on setting up Super ESCOs.
  - **Saudi Arabia** and **three of seven UAE emirates** have operative Super ESCOs.
  - Private Super ESCO **SOFIAC** in Canada and **Climargy** in the Philippines recently became operational.

Global ESCO market growth, 2015-2021



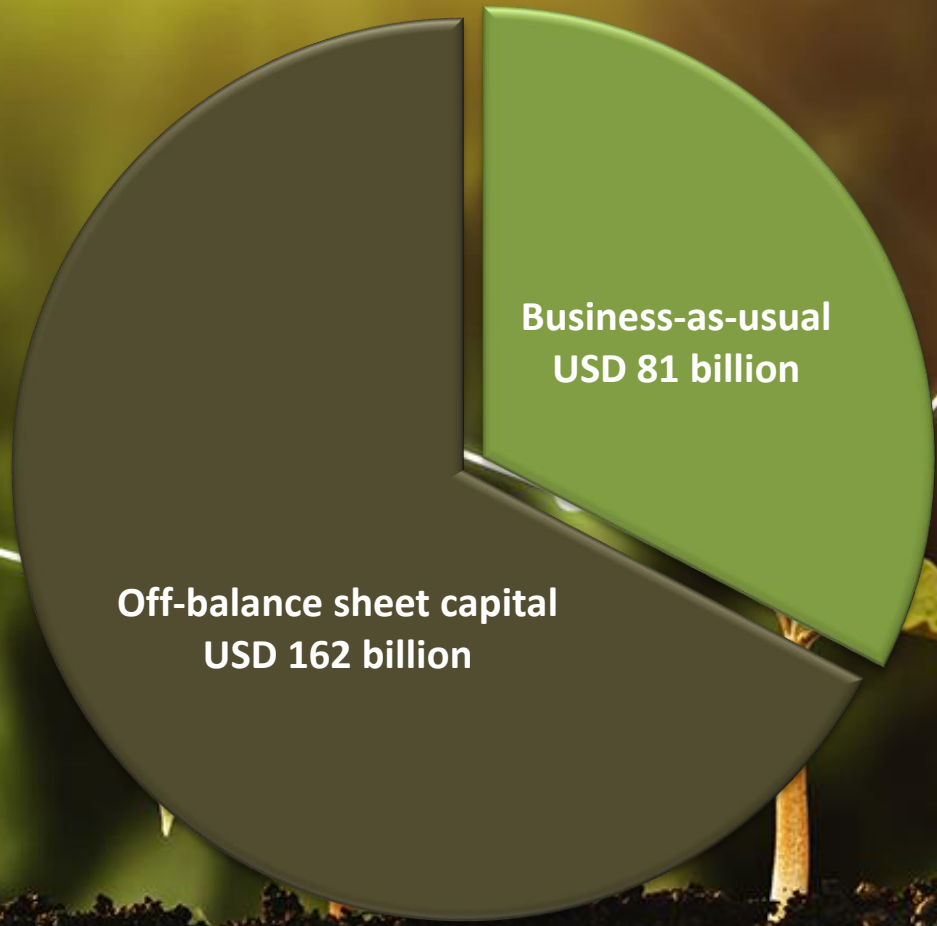
Source: IEA Energy Efficiency 2022

Philippines' EE capital requirements, 2017-2040

Republic Act 11285, Energy Efficiency and Conservation Act, will enable new modalities of public and private sector energy efficiency capital flows

Off-balance sheet* EE capital flows through:

- ESCO performance contracts
- PPP transactions
- JV agreements
- Government, large-scale retrofit programs
- Other off-balance-sheet* modalities



Business-as-usual EE capital to be mobilized through:

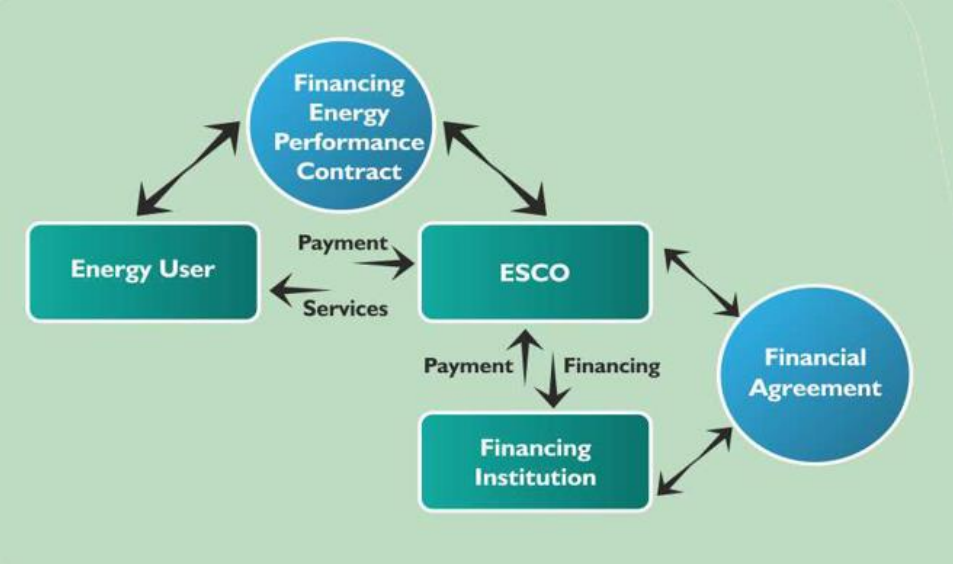
- Self-financed
- Debt-financed
- Lease-financed
- Other on-balance-sheet* modalities

* Balance sheet of host or end-user of EE project

Source: A. Ablaza, PE2, 2019

ESCO Definition

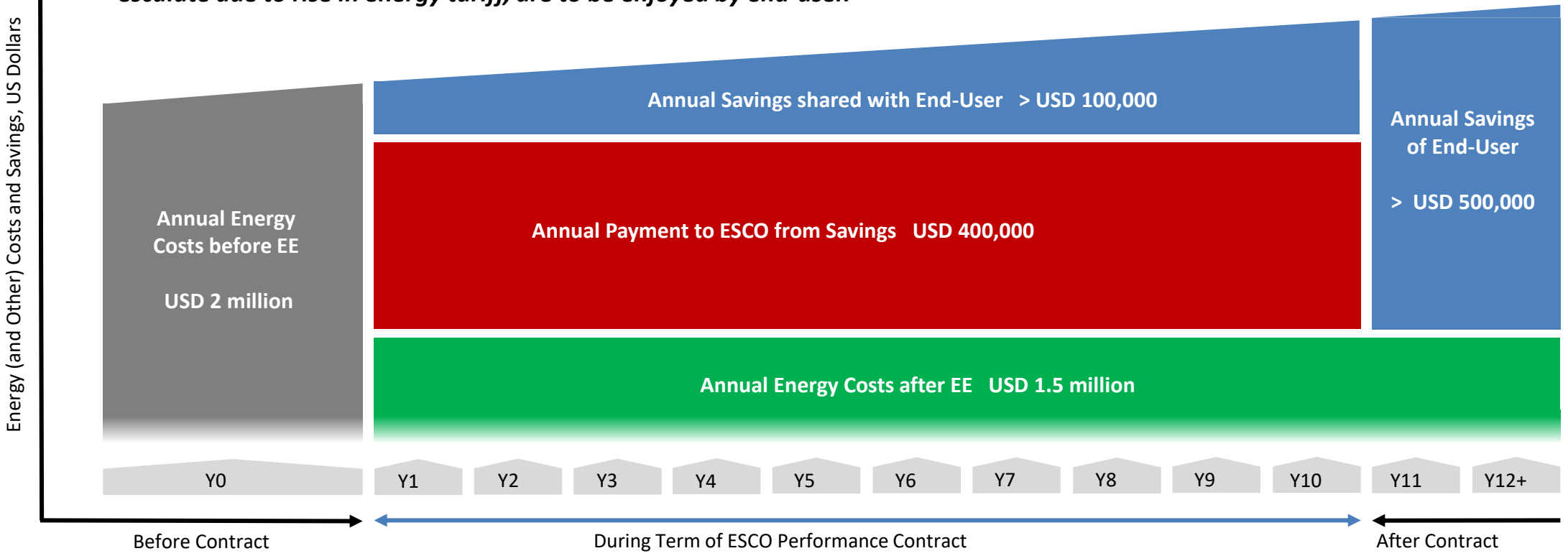
DOE defines an **energy service company (ESCO)** as a juridical entity that offers multi-technology services and goods towards developing and designing EE projects, delivering and guaranteeing energy savings, and ensuring cost-effective and optimal performance



Using energy savings to pay ESCOs and other third-party investors

Energy (and other OPEX) savings can be used to finance EE projects implemented by ESCOs and third party project companies under shared savings performance contracts.

Example: ESCO project reduces annual electricity bill from USD 2 million to USD 1.5 million. Out of 25% savings, USD 400,000 can be used to pay ESCO or project company. Remaining savings, which normally escalate due to rise in energy tariff, are to be enjoyed by end-user.

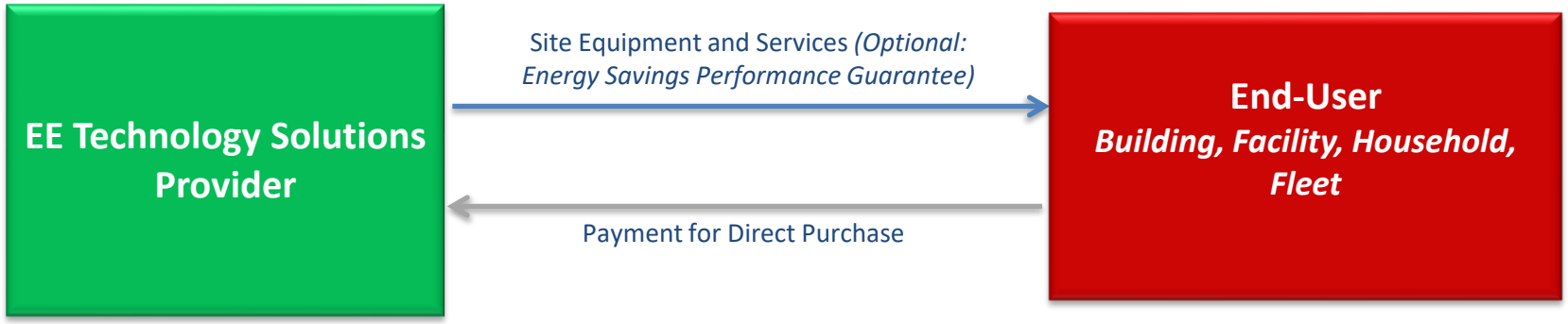


The ESCO financing model

It's evolving!

Self-financed EE projects

- On-balance sheet procurement.
- Typically, 100% of EE project cost is funded by end-user or facility owner.
- End-user or facility owner is the legal and “accounting” owner of the EE equipment assets from beginning. Applies to all energy end-use sectors: residential, commercial, industrial, transport, government.
- End-user enjoys 100% of savings or avoided energy purchases immediately. In isolated cases wherein the EE technology solutions provider is an ESCO, the ESCO can issue an energy savings performance guarantee to the purchasing end-user.

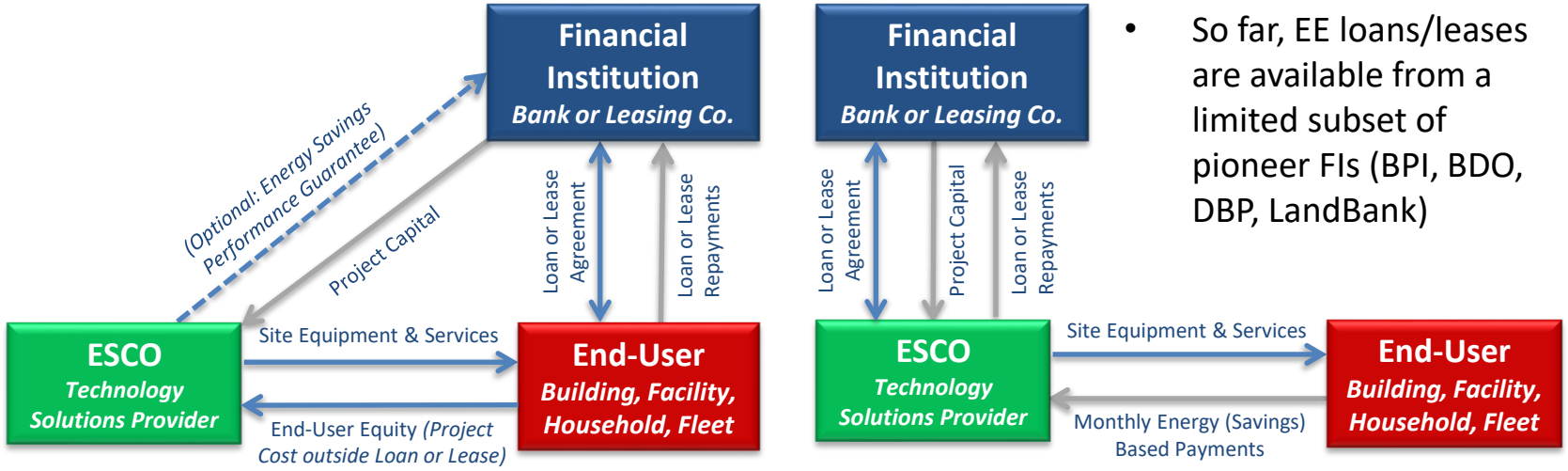


Barrier: EE for end-users is a non-core activity, and therefore a low-priority expenditure for it to be using available cash budgets.

Debt- and lease-financed EE projects

- On-balance sheet procurement.
- 70-80% of EE project cost is typically financed by a bank or leasing company.

- For EE equipment leases, the leasing company remains the legal owner of the EE equipment assets through lease term. For both EE loans and leases, the borrower or lessee (end-user or ESCO) becomes “accounting” owner from the beginning.
- Applies to all energy end-use sectors: residential, commercial, industrial, transport, government.
- Credit cards are popular ways of financing smaller, non-ESCO EE.



Guaranteed Savings Model *(End-User is borrower or lessee)* **Shared Savings Model *(ESCO is borrower or lessee)***

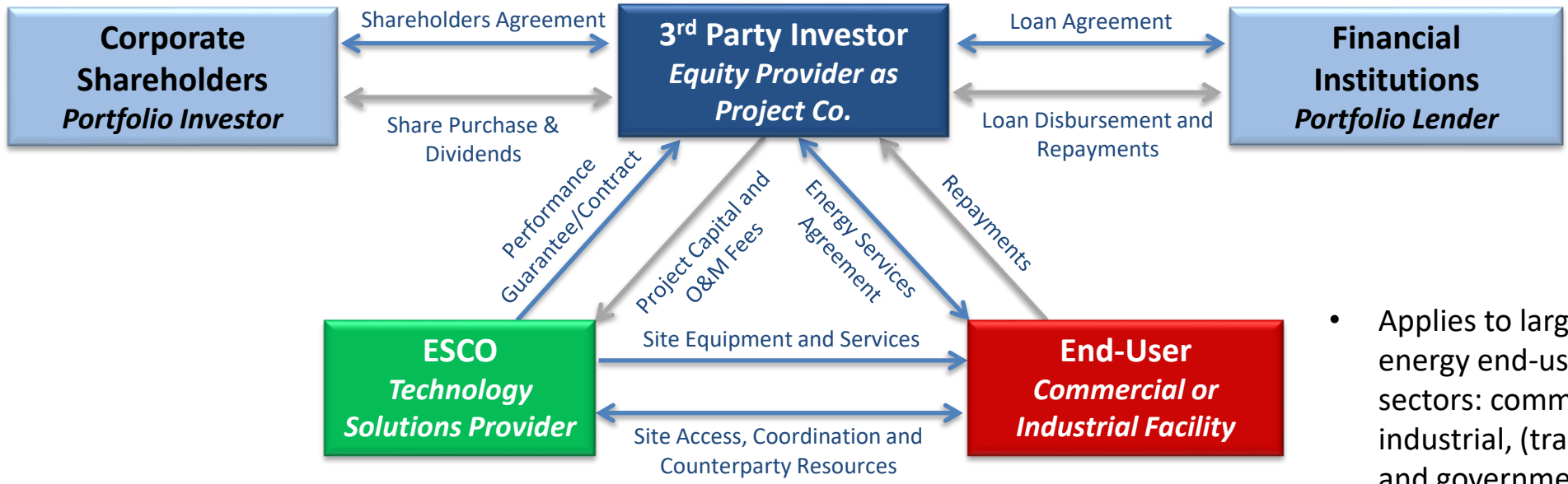
- So far, EE loans/leases are available from a limited subset of pioneer FIs (BPI, BDO, DBP, LandBank)

Barriers: Most ESCOs, MSMEs and households are not creditworthy enough to gain sufficient access to EE loan and leasing facilities. Many end-users (including C&I corporates) prefer not to use available credit/ leasing lines for non-core activities like EE projects.

Third Party Investor (Project Company) provides capital through ESCO portfolio

- Off-balance sheet procurement.
- In most cases, up to 100% of EE project cost is financed by a third party investor through a special purpose **Project Company (e.g. Equity Provider, Fund, Super-ESCO, SOE, Portfolio Investor)**

- The Project Company remains the legal and "accounting" owner of the EE equipment assets through contract term.
- Rationale: Over 98% of ESCOs in developing Asia have no adequate access to bank financing to grow their portfolio of performance contracts.



- Applies to larger energy end-use sectors: commercial, industrial, (transport) and government

Barriers: Third party investors find it difficult to capitalize EE projects unless after-tax returns are made commercially attractive (i.e. IRRs in upper teens) by a whole suite of fiscal incentives. Government procurement and PPP policies and guidelines will be needed to enable private investments in public sector EE projects.

EE measures

- **Retrofits**: HVAC/cooling, refrigeration, heating, ventilation, lighting, motor, drives, pumps, compressors
- Smart controls, building management systems, smart/micro grids
- Waste heat recovery, combined heat & power, co/tri/polygeneration
- Own-use renewables (e.g. solar PV, solar thermal, biomass/biogas power, waste-to-energy, wind, etc.)
- Transport efficiency improvements, fuel switching (transition fuels)
- District energy (cooling, heating) and energy storage systems
- Process efficiency improvements (e.g. boilers, kilns, presses, molding, assembly/process lines, etc.)
- Replacing or upgrading ancillary systems or utilities (e.g. chilled water, compressed air, steam, etc.)
- Building envelope solutions (still a supplemental, non-ESCO measure)
- Other EE interventions that could displace business-as-usual energy utilization with measurable and verifiable results

The role of the pioneer private super-ESCO

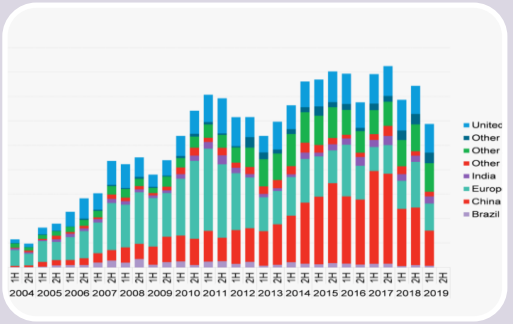
Aggregation

Why Climargy®? Addressing market failure for energy efficiency portfolio finance

Up to 98% of energy service companies (ESCOs) across developing Asia do not have suitable access to bank lending (or equity capital) to pursue their long-term pipeline of ESCO-financed performance contracts.

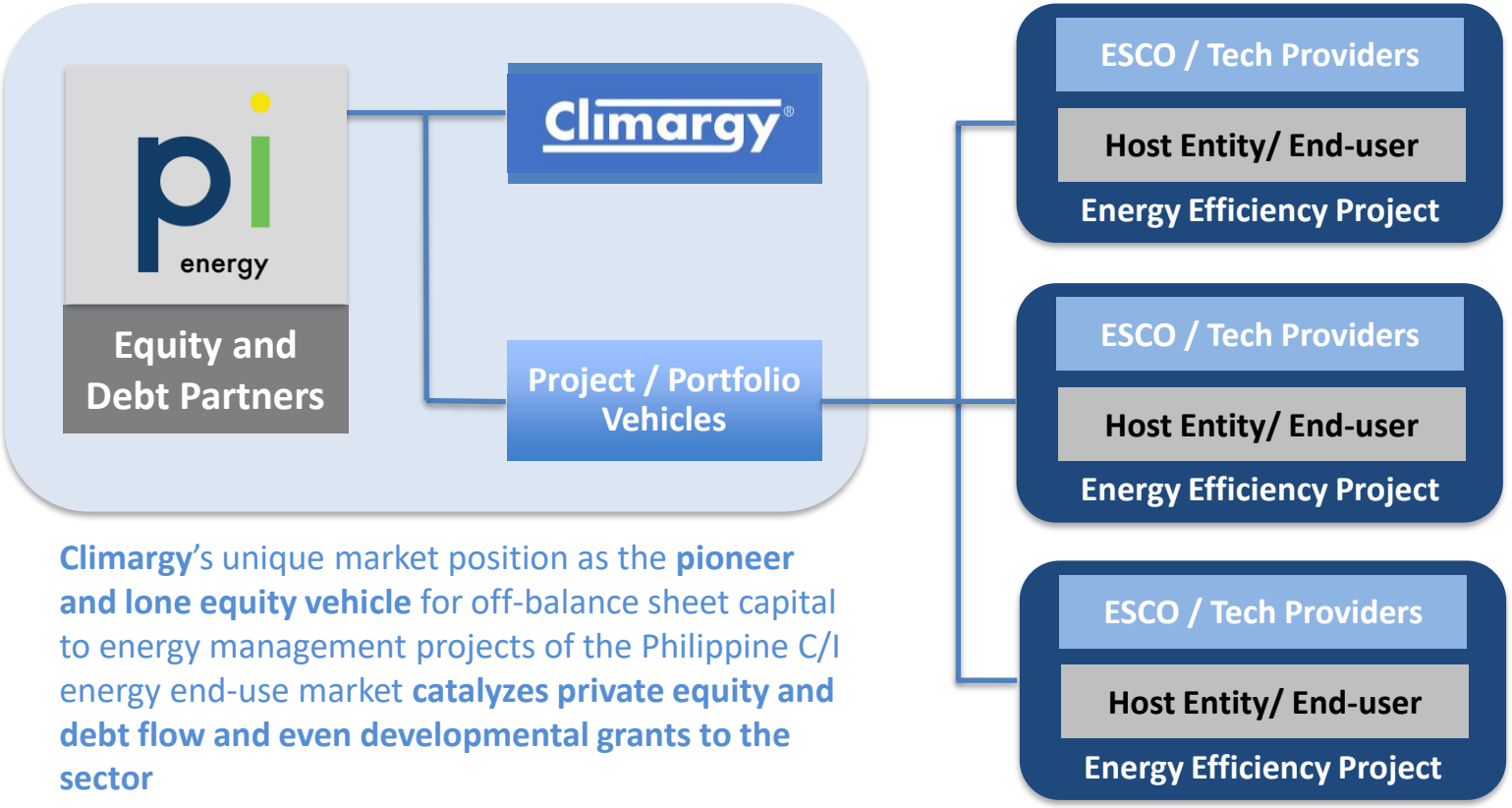
No energy efficiency aggregators exist nor "fund-like" or "super-ESCO" equity providers of project capital exist as corporate structures across developing or emerging economies.

No entity is removing the barriers or de-risking the upfront project development costs (especially for investment-grade energy audits) for energy efficiency projects in the Philippines.



Private capital is moving at a steadily growing velocity toward 20,000 MW renewable energy projects, but sadly NOT toward the 45,900 MW potential energy efficiency improvements.

Climargy® is among the world's pioneers in private sector ESCO project portfolio investments



Climargy's unique market position as the **pioneer and lone equity vehicle** for off-balance sheet capital to energy management projects of the Philippine C/I energy end-use market **catalyzes private equity and debt flow and even developmental grants to the sector**

Climargy® Portfolio Impacts of Initial Investment Tranche (target USD 108 million)

Target energy management projects in the commercial and industrial sectors

Energy efficiency upgrades implemented under **shared savings performance contracts**. Typical technologies and measures include HVAC/chiller retrofits, high efficiency motors, variable speed drives, pumps, compressed air systems, process efficiency improvements, LED relamping, building management systems, smart metering and controls, fuel switches and short-payback building envelope improvements.

Distributed renewable generation and energy storage projects implemented through **host energy-offtake agreements**. Typical technologies include rooftop solar PV, solar thermal cooling, district cooling, district heating and steam, waste heat recovery/organic rankine cycle, waste-to-energy, biomass-fired power and steam generation, thermal energy storage, battery energy storage systems.

Sample Project: Chilled Water Plant Upgrade (1,500 TR) for High-Rise Office Building

Annual Cooling Energy Delivery: 7,500,000 TR-h/y (24 h/d, 7 d/w duty)

Improvement of Chilled Water Plant Efficiency: Reduce from 1.329 kW/TR (baseline) to 0.700 kW/TR (EE project)

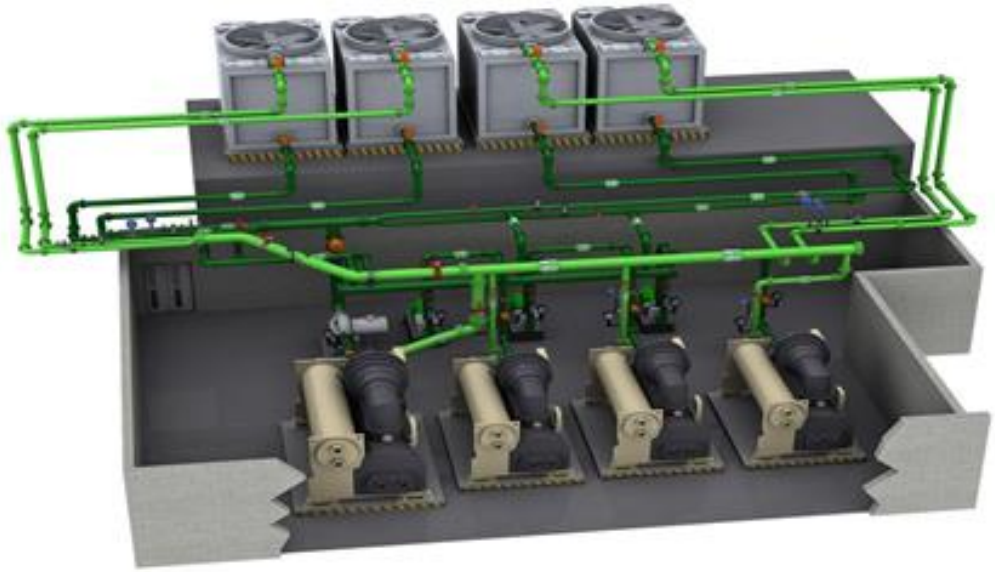
Annual Savings: 4.82 GWh/yr, USD 710,000 p.a. (electricity), USD 56,400 p.a. (maintenance); 3.30 MtCO2/yr (GHG emission reduction)

Project includes: 2 units x 750 TR chillers, 4 chilled water pumps, 4 condenser water pumps, 12 variable frequency drives, 4 cooling towers, controls and energy management system, M&V system, condenser tube cleaning, disassembly and removal of existing equipment, site installation works

Project CAPEX: USD 2.33 million (fully invested by Climargy, outside the balance sheets of ESCO and Building Owner)

Monthly Repayments: Fixed Fee of USD 60,800/mo (VAT inclusive), calculated as 85% of combined energy+maintenance savings

Contract Term: 10-years **Other Considerations**: ≥4-year income tax holiday

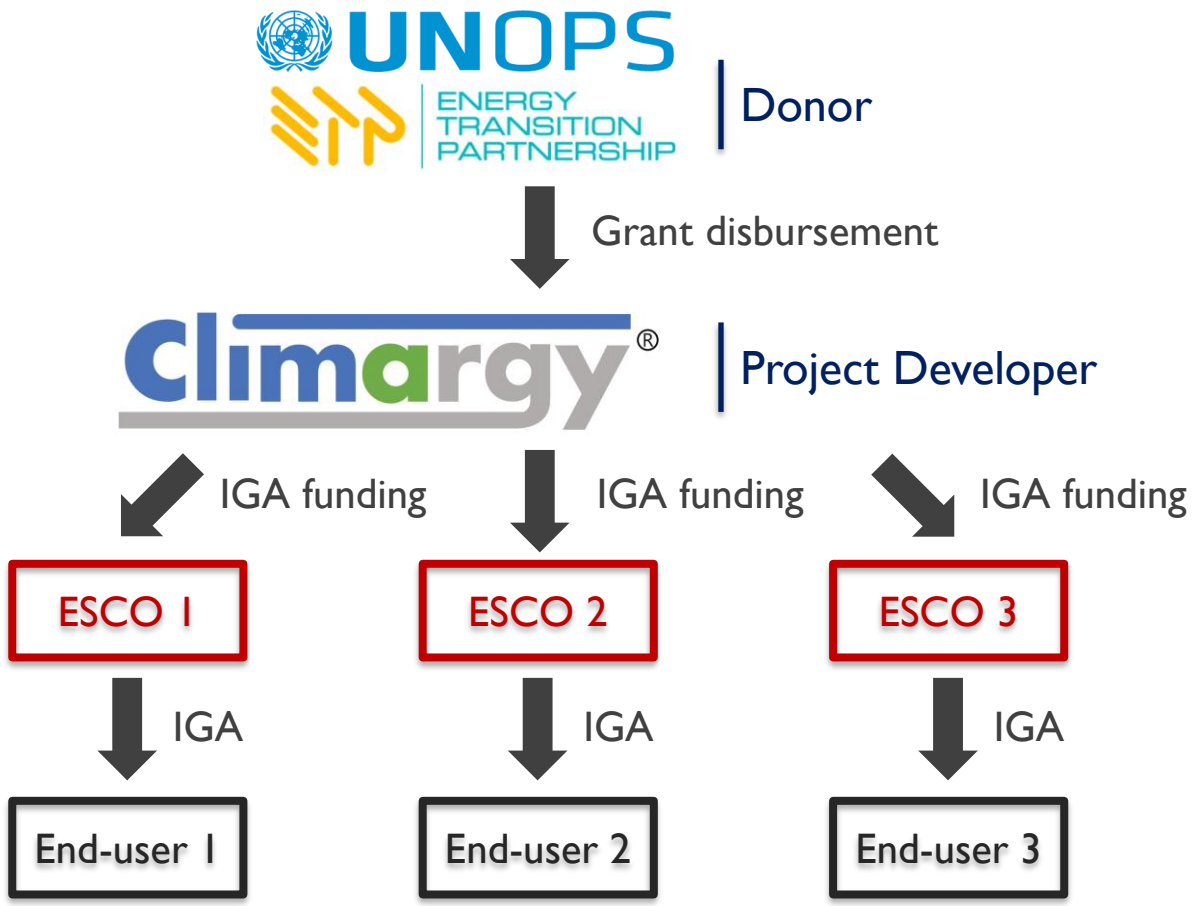


Lopez-led Pi Energy and Climargy® forge energy efficiency partnership

Pi Energy Chairman Federico R. Lopez (top, right) and Climargy CEO Alexander Ablaza (bottom, right) lead the ceremonial signing event with several officials and senior representatives of both firms on 9 December 2021. (Screenshot Images: Pi Energy)

- In December 2021, Climargy inked a **joint development partnership agreement** with the Pi Energy of First Philippine Holdings Corporation to develop energy efficiency projects for business establishments.
- The portfolio of projects resulting from this partnership is estimated to **reduce 1 terawatt-hour of energy consumption through 2040**, equivalent to **USD 150 million in power cost savings**.
- Wholly-owned subsidiary Pi Energy will represent the Lopez Group in this partnership, with its Vice President Ariel S. Villaseñor joining the board of Climargy.

UNOPS-ETP and Climargy®Co-financed Program for Investment-Grade Audits (IGAs)



- In May 2022, the UN Office for Project Services (UNOPS) and Climargy entered into a Grant Support Agreement for the Southeast Asia Energy Transition Partnership (ETP) Energy Efficiency Innovation Window (EEIW).
- Climargy will take on 11-15 IGAs over a 3-year program period. Contract amount per IGA will vary depending on project scope.
- ESCOs engaged for IGAs are within Climargy's network of partners and will be selected based on end-users' major sources of energy consumption.
- Targeted end-users are from the commercial and industrial sectors.

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