The Energy Transition Partnership (ETP)

Diagnostic Review and Analysis of Energy Efficiency Development in Southeast Asia

Terms of Reference | 17 Aug 2021

TERMS OF REFERENCE

Diagnostic Review and Analysis of Energy Efficiency Development in Southeast Asia

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I. Background

A. Southeast Asian Energy Transition Partnership (ETP)

1. The Southeast Asian Energy Transition Partnership (ETP) is a multi-stakeholder platform that aims to accelerate energy transition in Southeast Asia and contribute to the achievement of the UN's Sustainable Development Goals (SDGs) and the Paris Climate goals by bringing together Government Donors, Philanthropies and Partner Governments. ETP aims to empower its partner countries to transition towards an energy system that simultaneously ensures environmental sustainability, economic growth, and energy security. To achieve this goal, ETP will mobilize and coordinate the necessary technical and financial resources to create an enabling environment for renewable energy, energy efficiency and sustainable infrastructures in the region.

2. ETP aims to deliver joint action, improved coordination and dialogue to accelerate energy transition in the region by addressing impediments to renewable energy, energy efficiency and sustainable infrastructures. ETP Members have come together to fund ETP to (1) support an improved delivery environment to accelerate the energy transition in Southeast Asia, (2) improve coordination between other relevant initiatives in the region, including capital investments and technical assistance, and (3) where possible and appropriate, to promote communication and knowledge sharing among stakeholders in the region on energy transition.

3. With an initial focus on Indonesia, the Philippines and Vietnam, ETP has a mandate to mobilize resources and coordinate the necessary technical assistance to create an enabling environment for energy transition. This includes through high-level technical advisory support, grant-making and capital investment programs, capacity, and skills development programs, and convening of cross-sectoral dialogues with decision makers and broader sets of stakeholders.

B. Energy Efficiency in Southeast Asia

4. To harness and sustain the impressive economic growth the Southeast Asian (SEA) Region has seen, and to meet the growing energy demand in consequence, the SEA countries intend to reduce the regional energy intensity (EI) by 32% by 2025, relative to the 2005 level[1]. Without the prioritization of Energy Efficiency, the set goal to accelerate energy transition and strengthen the energy resilience is harder to achieve and impedes the region's endeavors to move away from conventional energy.

5. With regard to the energy transition in SEA (and globally), all credible studies and plans point to the need for energy efficiency to play a prominent role in achieving both cost-effective emissions reductions and improving the utilization of investments into available energy system resources.

[1] ASEAN. 2020. JOINT MINISTERIAL STATEMENT OF THE 38 th ASEAN MINISTERS ON ENERGY MEETING. https://asean.org/storage/JMS-of-the-38th-AMEM-Final_Mins.pdf

6. As a forecast of the Global Climatescope[2] suggests that the countries in the region will need to spend USD14 billion by 2030 to ensure the growing energy demand and an uninterrupted access to energy. It has been shown that only a 1%–4% investment in energy efficiency is sufficient to meet 8 - 25% of the projected increase in primary energy consumption by 2030[3]. This dynamic reinforces EE's relevance as a least-cost solution to meeting Southeast Asia's growing energy demand. This will be achieved by harnessing the cost-effective investment where regional energy security will be boosted by lowering the need for imported energy.

7. The practical challenge that designers of programs and initiatives face, however, is that even though the financial returns of energy savings investments are routinely identified as high and bankable in studies concerning the potential of energy efficiency, there is substantial under-investment in cost-effective energy efficiency initiatives. This "EE investment gap" persists, almost universally, across all countries. The reality is that both the number of *implementation-ready* EE projects, and the availability of financing for such projects, remain suboptimal because of the various technical, institutional, and financial barriers.[4]

8. If a sufficient range of investments are to be allocated for energy efficiency in the region, greater efforts are necessary to marshal policy and stakeholder collaboration in support of such outcomes. In many cases, EE strategies are guided by laws, institutional frameworks, targets, and action plans. Thus, bold, and ambitious national policy targets for EE in Southeast Asia can play a critical role in advancing regional investment for EE interventions and solutions. For example, the national EE targets introduced by SEA countries include:

    - **Indonesia.**[5] Decrease energy intensity by 1% annually and decrease energy–GDP elasticity to below 1% by 2025
    - **Philippines**[6]: 3% of reduction in energy intensity across key economic sectors and at least 10% of energy saving on electricity from all sectors by 2040
    - **Viet Nam**[7]**:** 5-7% of energy saving in the period of 2019-2025; 8-10% of energy saving in the period of 2019-2030; and reduce power loss to less than 6.5% by 2025

9. Expanding awareness and adoption for effective enabling policies of globally proven energy efficiency policy options, including building energy codes, minimum energy performance standards (MEPS), or disclosure of building energy consumption, can further mobilize resources for innovative EE technologies and measures. Development of effective pathways, action plans and investment to

[2] Climatescope is a unique market assessment, interactive report and index that evaluates the investment conditions for clean energy in emerging economies and evaluates their ability to attract capital for low-carbon energy sources while building a greener economy. The first edition was developed by the Multilateral Investment Fund of the Inter-American Development Bank Group in partnership with Bloomberg NEF.

[3] ADBI. 2020. Energy Efficiency in ASEAN: Trends and Financing Schemes. Oct, 2020. Available at: https://www.adb.org/sites/default/files/publication/648701/adbi-wp1196.pdf

[4] (i) Low Awareness of Energy Efficiency, (ii) Lack of Technical Capacity and Project Development Skills, (iii) Small Scale of Energy Efficiency Projects, (iv) Lack of Consistently Enforced Regulations, and (v) No Commercially Attractive Local Financing.

[5] Government Regulation No. 79/2014: National Energy Policy, Article 9.

[6] Energy Efficiency and Conservation Roadmap 2017 – 2040 and Philippines Energy Plan (PEP) Energy Demand and Outlook 2017 – 2040.

[7] Vietnam National Energy Efficiency Programme (VNEEP) 2019 – 2030 – Decision 280/QD.

reflect the ambitious EE initiatives has been, however, a challenge. The regional and international development partners and actors can play a catalytic role to provide both technical and financial assistance to help SEA countries realize the abundant energy efficiency opportunities. Recent experience with development partners programs to promote energy efficiency in Southeast Asia is depicted in Annex 1.

10. Work under this initiative will complement the "*ETP Energy Efficiency Innovation Window*" by providing a diagnostic of the political economy surrounding energy efficiency in the SEA region, including provide a compendium and a study of policy mapping and challenges and opportunities and gaps in EE policy frameworks, identify donor-coordinated efforts to advance EE-outcomes, and in energy savings and reduced carbon emission (CO2) as a result of enhanced energy efficiency programs and investments in Southeast Asia.

II. Functional Responsibility

A. Project Identification

11. ETP is seeking a consultant (the Consultant) for a short-term assignment to provide a review and an analysis (i) of the energy efficiency policies, implementation performance and outcomes of implementing these policies, challenges and opportunities in their coverage and implementation, and gaps and issues with respect to these policies; (ii) of the on-going energy efficiency initiatives and measures, and programs and their success and potential to generate energy savings and reduce carbon emissions; and of the political economy surrounding energy efficiency initiatives and investments in the three SEA countries of Indonesia, the Philippines and Viet Nam.

12. Specifically, the consulting services will:

i. Review and map the current existing national initiatives and policy frameworks, including pertinent policies for energy efficiency, their regulations and implementation tools and relevant investment policies, regulations and investment tools, including the financial supervisors' guidance on greening financial portfolios and environment, social and governance (ESG) requirements and their respective strengths and weaknesses, including with respect to their coverage and implementation performance, any potential gaps and overlaps with the objective to develop a comprehensive understanding regarding the achieved and potential energy savings and reduction of carbon emissions that can be realized and achieved under different scenarios with respect to the current national targets and the availability of donor support.
ii. Review the on-going donor efforts addressing energy efficiency outcomes and identify the potential needs and gaps. This will include the mapping of on-going stakeholder efforts; and
iii. Outline the current political economy and related characteristics pertinent to addressing the gaps and shortcomings in the policy frameworks, efforts made by the development partners, and identify how any gaps and shortcomings can be addressed and where the critical and

bottlenecks and breakthrough points are for potential programming by ETP or related aligned programs.

iv. Canvas interventions and programs required to fill the identified gaps and opportunities to resolve overlaps, and provide guidance regarding openings and improvement in the political economy to expand energy efficiency markets to reduce carbon intensity of the economies.

B. Specific Deliverables

13. The selected consultant will produce the following products:

- Inception Report provides the methodology for technical delivery and timeline, data collection and implementation framework for accomplishing the assignment.
- First Draft Report including the review of opportunities and gaps of national EE policy frameworks, mapping of on-going donor support efforts for EE initiatives and identification of potential needs and opportunities, and derivation of energy savings and carbon emission reductions achieved through achieving Energy Efficiency initiatives under BAU scenario and other scenarios including donor support.
- Final Report that incorporates findings, recommendations and conclusions and incorporates comments sought and received from the Steering Committee of ETP and ETP Secretariat, its Aligned programs and other development partners and stakeholders. The Final Report provides an Executive Summary and a catchy powerpoint presentation that enables quick presentation of the Final Report's content.

III. Timeline, Qualification and Eligibility Criteria

Schedule:

The consultant will deliver the outputs of this consultancy in line with the schedule below:

Task	Timeline	Payment
Inception Plan	1 week of contract start date	20%
First draft report	3 weeks of contract start date	40%
Final report	5 weeks of contract start date	40%

Qualifications and Experience of the Consultant:

The service provider should have the following experiences:

- Minimum 3 years of experience in working in similar capacities

- Has proven experience working with NGOs, government agencies, or intergovernmental organizations

The service provider is expected to identify (a) designated employee(s) to produce the above outputs. The individual(s) should have the following qualifications (CV should be attached to the application):

Education

Minimum advanced university degree (master's or equivalent) in Energy Economics, Engineering, International Economics and/or Relations, Public Relations, Public Policy, International Development, or related field.

Work Experience

- Minimum three (3) years of relevant work experience in the energy sector required, preferably in energy transition, energy efficiency, energy and energy investment policies and regulations, economics or related academic fields.
- Experience in energy efficiency, energy policy and sector assessments, business development, project or programme management development required
- Ability to engage with other UN agencies, donors and development stakeholders.
- Experience with coordinating work between different sectors and stakeholders, including governments, international financial institutions, UN and other development partners required
- Ability to establish strong working relations with senior officials in line ministries desirable

Language:

Fluency in oral and written English required.

Eligibility and Formal Criteria – evaluated on Pass/Fail basis

Criteria	Documents to establish compliance with the criteria
1. Bidder is eligible as defined in Instructions to Bidderss, Article 3	● Form A: Quotation Submission Form
2. Completeness of the Quotation. All required Questionnaires (if any), and Returnable Bidding Forms and other documentation requested under the Document Checklist section have been provided and are complete	● All documentation as requested under Instructions to Offerors Article 10, Documents Comprising the Proposals
3. Offeror accepts UNOPS General Conditions of Contract as specified in Section IV	● Form A: Quotation Submission Form

Qualification criteria – evaluated on Pass/Fail basis

Criteria	Documents to establish compliance with the criteria
1. Bidder should be legally registered	● Certification of incorporation of the Offeror
2. Bidder should have minimum 3 years working in similar capacity	● Certification of incorporation of the Offeror ● Form D : Previous Experience Form
3. Bidder has proven experience working with NGOs, government agencies, or intergovernmental organizations	● Form D : Previous Experience Form

Technical criteria – evaluated on Pass/Fail basis

Criteria	Documents to establish compliance with the criteria
1. Services offered in the quotation are compliant compared to the requirements in Section II: Schedule of Requirements	● Form C: Technical Quotation Form ● Form E: Format for Resume of Proposed Key Personnel
2. Supplier will consciously reduce or limit unnecessary travel during the delivery of the contract, and will prioritize teleworking where possible to minimize the creation of emissions	● Questionnaire

Section number/description	
1.	Offeror's qualification, capacity and expertise
2.	Proposed Implementation Plan
3.	Key Personnel proposed

Section 1: Offeror's qualification, capacity and expertise

1.1	Brief description of the organization, including the year and country of Incorporation.
1.2	Description of the organization's experience in working with NGOs, government agencies, or intergovernmental organizations

Section 2: Proposed Implementation Plan	
2.1	Description of the bidder's implementation timeline, including gantt chart showing how the deliverables will be managed throughout the specified timeline in the Terms of Reference

Section 3: Key personnel proposed	
3.1	Composition and structure of the team proposed.
3.2	Qualifications of key personnel proposed

Annex 1: Recent Development Partner Experience to Promote Energy Efficiency in Southeast Asia

Regional

United Kingdom: The UK Asean Low Carbon Energy Program supports Southeast Asian countries in the following areas: (i) strengthening energy efficiency policy and regulations, mandates or targets, along with capacity building support, (ii) **developing energy data collection processes** and methodologies that can be used to strengthen analysis of industry energy data, (iii) **scaling up energy efficiency investments** by catalysing pilot projects, designing new products and opening up markets for energy service companies (ESCOs), and **strengthening the business case for energy efficiency** by promoting energy management systems and identifying energy savings opportunities for food and beverage companies. It also supports industry at different stages of their energy management journey. It helps them to realise the importance of energy efficiency, identify energy savings opportunities, improve energy performance, and take steps to set up new energy management systems or improve existing systems. The programme offers support for capacity building, tailored assistance and energy efficiency networking. It also develops guides, tools and webinars to assist the scaling of energy efficiency in business.

Indonesia

Industry

DANIDA. Danida (the Danish International Development Agency) had a large project, Energy Efficiency in the Industrial, Commercial, and Public Sectors during 2008-2013, and has had a number of programs that support the Indonesian government in designing incentive programs for retrofits, designing the certification program for energy auditors, and subsidizing initial energy audits, though this did not yield substantial implementation.

AFD. AFD has financed investments and reforms in energy efficiency through development policy loans, direct loans to the public electricity company (PLN), and through dedicated credit lines to local banks supporting private or public investors. Most of these efforts have not been highly successful, with the requirement to use local intermediary banks proving restrictive in terms of overall cost of finance to the end user.

GIZ. Over the past five years, GIZ has assisted MEMR in establishing appropriate incentive mechanisms for the implementation of efficient refrigeration and air conditioning technology in selected areas. To demonstrate the advantages of green cooling technology, pilot projects were implemented and technicians trained/certified.

IEA. While not specific to the industry sector, IEA has been working towards improvements in energy data and statistics across demand and supply, leading to more timely submission and publication of Indonesian energy data.

APEC and APERC. APEC has approved a Peer Review on Energy Efficiency (PREE) to be conducted in Indonesia in the second half of 2020. PREE deliverables include a Peer Review Report on Energy Efficiency for the host economy, which will include the identification of barriers to the effective implementation of the action plans and the recommendations for overcoming those barriers. The report covers a variety of issues such as institutional framework, goals and strategy, data collection and monitoring, policy measures and education. The process is conducted by the Asia-Pacific Energy Research Centre (APERC) in consultation with MEMR and includes experts from other APEC economies and international organisations. This PREE will differ from the previous effort in 2011, because it will focus explicitly on industry and commercial buildings.

ADB. Following earlier support for energy efficiency finance capacity building for Indonesia's banking

sector, in 2019 ADB approved a $500m loan for sustainable energy improvements, with a related assistance program to bolster energy efficiency policy and create an energy efficiency investment program, to enable municipalities and government contracting agencies to engage in energy efficiency savings programs with energy efficiency service companies (ESCOs) under Indonesia's revised 2018 legislation on PPPs and its Regulation on Government Procurement of Goods and Services Policy 29/2018, (Peraturan Lembaga Kebijakan Pengadaaan Barang / Jasa Pemerintah), which regulates solicited PPPs. The focus will be on replacing municipal street lighting and retrofitting buildings. In the area of ESCOs, ADB has been assisting MEMR since 2018 in development of a pilot project that applies the ESCO business model, and includes a capacity building program for ESCO professionals that covers certifications such as Certified Investment Grade Energy Audits (CIGAs) and Certified Energy Saving Verifier (CESVs). This work is being done in collaboration with EPS Corp, MASKEEI, TUV Nordt (CIGA) and EVO (CESV).

UNIDO. UNIDO is a long-standing provider of support to many countries including Indonesia on training and capacity building for energy management systems and ISO 50001 accreditation for professions in industry. In more recent times, UNIDO has also worked with Indonesia as one of the leading countries in its Industrial Energy Accelerator program, performing a useful diagnostic of issues and areas that could be addressed (Industrial Energy Accelerator, 2019). The study concluded that design of a national seed-fund to provide concessional debt for industrial energy efficiency projects was needed to allow for large-scale proof of concept demonstrations in key industries such as mining, textiles and cement production, and that the design and introduction of de-risking instruments is needed, to attract more private sector capital to the national energy efficiency market.

UNESCAP and UN Environment. Indonesia has commenced the process of developing a National Cooling Action Plan, with support from UNESCAP and UN Environment. The Plan will help to quantify overall cooling needs in the country and galvanize efforts towards meeting cooling needs more efficiently across a range of sectors, including space cooling in buildings as well as commercial/industrial cold chains and refrigeration. UNEP has also been active in recent years in assisting Indonesia to develop minimum energy performance standards (MEPS) in key appliance classes, through its United for Efficiency initiative.

Buildings

DANIDA. Danida (the Danish International Development Agency) had a large project, Energy Efficiency in the Industrial, Commercial, and Public Sectors during 2008-2013, which provided tools for building energy codes and established an information clearinghouse for energy efficiency. Since then, DANIDA has continued to support the design of voluntary Jakarta municipal building standards and mandatory building codes. DANIDA has also had a number of programs that support the Indonesian government in designing incentive programs for retrofits, designing the certification program for energy auditors and subsidizing initial energy audits, though this did not yield substantial implementation.

AFD. AFD has financed investments and reforms in energy efficiency through development policy loans, direct loans to the public electricity company (PLN), and through dedicated credit lines to local banks supporting private or public investors. Most of these efforts have not been highly successful, with the requirement to use local intermediary banks proving restrictive in terms of overall cost of finance to the end user.

GIZ. over the past five years, GIZ has assisted MEMR in establishing appropriate incentive mechanisms for the implementation of efficient refrigeration and air conditioning technology in selected areas. To demonstrate the advantages of green cooling technology, pilot projects were implemented and technicians trained/certified.

IEA. While not specific to the buildings sector, IEA has been working towards capacity building in energy efficiency implementation and improvements in energy data and statistics across demand and supply, leading to more timely submission and publication of Indonesian energy data.

APEC and APERC. APEC has approved a Peer Review on Energy Efficiency (PREE) to be conducted in Indonesia in the second half of 2020. PREE deliverables include a Peer Review Report on Energy Efficiency for the host economy, which will include the identification of barriers to the effective implementation of the action plans and the recommendations for overcoming those barriers. The report covers a variety of issues such as institutional framework, goals and strategy, data collection and monitoring, policy measures and education. The process is conducted by the Asia-Pacific Energy Research Centre (APERC) in consultation with MEMR and includes experts from other APEC economies and international organisations. This PREE will differ from the previous effort in 2011, because it will focus explicitly on industry and commercial buildings.

IFC. IFC assisted the City of Jakarta to develop a Green Building Code in 2011, with reference to the Green Building Council Indonesia. This regulation was enacted in 2012. The Jakarta building energy code apparently inspired the central government to establish a national building code in 2017, and also inspired other major cities on Java, like Bandung, Semarang, and Surabaya to replicate it. While these efforts are in progress, we were not able to get information on the implementation status. Since 2017, IFC has been partnering with the Green Building Council Indonesia—providing resources for adoption of its EDGE online platform, green building standard and certification system. In 2019, IFC and the Swiss Government provided targeted assistance to Semarang in Central Java through its Green Buildings Market Transformation Program, to support the city's adoption of greener building codes. IFC has further developed a "National Green Building Toolkit" with the Ministry of Public Works and Social Housing, to assist local-level adoption of national policy, and worked to initiate green bonds for green buildings projects through the bank OCBC NSP.

ADB. Following earlier support for energy efficiency finance capacity building for Indonesia's banking sector, in 2019, ADB approved a $500m loan for sustainable energy improvements, with a related assistance program to bolster energy efficiency policy and create an energy efficiency investment program, to enable municipalities and government contracting agencies to engage in energy efficiency savings programs with energy efficiency service companies (ESCOs) under Indonesia's revised 2018 legislation on PPPs and its Regulation on Government Procurement of Goods and Services Policy 29/2018, (Peraturan Lembaga Kebijakan Pengadaaan Barang / Jasa Pemerintah), which regulates solicited PPPs. The focus will be on replacing municipal street lighting and retrofitting buildings. Status of this work is currently unclear. In the area of ESCOs, ADB has been assisting the Ministry of Energy and Mineral Resources since 2018 in the development of a pilot project in Commercial Buildings. The project applies the ESCO business model, and includes a capacity building program for ESCO professionals that covers certifications such as Certified Investment Grade Energy Audits (CIGAs) and Certified Energy Saving Verifier (CESVs). This work is being done in collaboration with EPS Corp, MASKEEI, TUV Nordt (CIGA) and EVO (CESV).

USAID. In 2013-14, USAID explored a regional solution to reduce energy use and carbon emissions in the large and continuously expanding stock of commercial buildings in Asia, through the development and demonstration of a regional building energy performance benchmarking system and engagement of key regional partners. In partnership with ICF, a Benchmarking Tool was first developed for the Indonesian hotel sector, where existing energy consumption data created an opportunity to develop and showcase the potential impact for benchmarking across the region and where steady growth in visitors of 9-13% was being recorded annually. The Tool developed for Indonesia was designed to be simple to use while providing an accurate comparison of building energy performance. Benchmarking and EE improvements at 1,000 hotels in Indonesia were estimated to yield annual savings of 533 million kilowatt hours (kWh), 388 billion Indonesian Rupiah (US$ 38 million) and 381,000 $MtCO_2e$ avoided. MEMR became interested in using the tool to set minimum energy performance standards for the hospitality sector, however did not commit further resources into expanding and maintaining the existing benchmarking tool or housing it online. More recently, USAID worked with key Indonesian stakeholders, including MEMR/ESDM, the National Planning Agency (BAPPENAS) and the Financial Services Authority (OJK) to promote and accelerate renewable energy and energy efficiency as part of the Indonesia Clean Energy Development – Phase 2 (ICED II), soon to be renewed for a further five years, with a focus on sustainable finance.

Other noteworthy initiatives include:

- The Global Buildings Performance Network (GBPN) together with its local partners is establishing a policy advisory working group called HIDUP (meaning 'Live' in Bahasa Indonesia), which is a multilateral working group composed of building experts from both public and private entities. Its aims are the assessment, review and challenge of current regulatory frames (building codes), and their improvement and enforcement at national and regional level, along with their potential and limits in driving the building market shift toward net zero buildings.
- Indonesia has commenced the process of developing a National Cooling Action Plan, with support from UNESCAP and UN Environment. The Plan will help to quantify overall cooling needs in the country and galvanize efforts towards meeting cooling needs more efficiently across a range of sectors, including space cooling in building and residential and commercial refrigeration.
- The American Society of Heating Refrigeration and Air-conditioning Engineers (ASHRAE) has an active local chapter in Indonesia. ASHRAE administers educational seminars, training courses and exchange of best practices from the region for building practitioners.

ESCOs most active in the market include:

- Johnson Controls
- PT Signify Commercial Indonesia
- PT Sucofindo (Persero)
- PT Atmi Kreasi Energi
- PT Miura Indonesia
- EPS Capital Corporation
- Synergy Energy Solutions
- Smardt Indonesia

Commercial buildings, apartments and malls are mainly owned by big Indonesian property groups (e.g. Djarum; Summarecon, Lippo, Ciputra Group, Sinarmas Group, Murdaya (CCM), etc.). Some office buildings are also owned by state-owned enterprises such as Pertamina and Telkom. Typically, there is an unwillingness to use own credit lines on energy efficiency projects, being perceived as not related to their core business and without a large enough economic impact on operational costs. Electricity costs make up only 15% of operational costs in a commercial building and, even though 10-35% of electricity reduction might be possible, it remains a small percentage of overall operational costs.

There is also a pervasive lack of trust in and experience with external service providers and ESCOs in the provision of third-party finance. Recent increases in electricity prices, along with pressure to achieve clean energy development targets under national and international obligations, might change the economic dynamics of building energy efficiency projects in the future.

Philippines

Buildings

ADB (Asian Development Bank). ADB has had a series of investments in efficiency-related areas in the past 10 years, notably the multi-faceted Philippine Energy Efficiency Project, in which large-scale procurement and promotion of CFL lamps and government building retrofits were the most successful components. ADB also published a comprehensive assessment and strategy for the Philippines energy sector in 2018 (ADB 2018).

EU-SWITCH. Through its regional programme on sustainable consumption and production, the EU focused on energy efficiency in the Philippines, culminating in its support for the Energy Efficiency and Conservation Roadmap 2017-40.

World Bank. The World Bank implemented the $48m Chiller Energy Efficiency Project for the Philippines from 2010 to 2017 and aimed to reduce greenhouse gas (GHG) emissions by replacing inefficient chillers including Chlorofluorocarbon (CFC)-based chillers and non-CFC-based chillers.

IFC (International Finance Corporation). IFC partnered with the Philippines Green Building

Initiative (PGBI) in 2016 to launch the EDGE certification program. The EDGE program has been very active in the Philippines, carrying out building certification, as well as numerous building energy surveys, which fed into an assessment of the market for new residential and commercial building construction and the potential for green building construction (IFC 2019, and see above). IFC has tracked data on the performance of more than 90 green building projects across the country through EDGE and other certification initiatives (IFC 2019). It has also been instrumental in working with large local banks BDO and BPI to establish sustainable energy finance programs, by providing risk-sharing facilities, advisory services, and also assisting them to issue green bonds for green building investments.

ENPAP 4.0. ENPAP 4.0 is a non-government, non-profit association of energy management practitioners, professionals and consultants in the Philippines. It is the successor of the Energy Efficiency Practitioners Association of the Philippines (ENPAP, 2000) and its immediate predecessor the Energy Management Association of the Philippines (ENMAP, 2010s). Since 2019, ENPAP 4.0 has served as a catalyst and provided an avenue for knowledge transfer and information exchanges through the conduct of training courses and seminar-workshops, conferences, and developing strategic advocacy positions and policy initiatives with key government agencies on energy efficiency and conservation legislation, technologies and practices. ENPAP 4.0 continued to assume the role of ENPAP as an ASEAN Centre for Energy (ACE) Action Partner and conducted training courses for the Certification for Energy Managers under the ASEAN Energy Manager Accreditation Scheme.

Philippines Energy Efficiency Alliance (PE2). PE2 is an association of Philippines ESCOs that operates with guidance and oversight from the Philippines Department of Energy.[8] PE2 acts as a convener of ESCOs and also facilitator of multi-stakeholder dialogues on energy efficiency policy, regulation, and finance, with the aim of giving the private sector and civil society a platform to provide input into energy efficiency policy and regulation, and to stimulate increased financing and implementation of energy efficiency projects.

World Bank. The World Bank's ESMAP unit has supported the improvement of EE in public buildings in the Philippines by providing technical support over the entire project cycle in the form of energy diagnostics and audits, training and capacity building, design and implementation mechanisms, and advisory services. The program also works in collaboration with the Asia EDGE building certification.

GIZ. Through involvement with the Access to Sustainable Energy Programme (ASEP), C4 (Kigali), and its flagship CASE Energy Transition Programme, GIZ is assisting the Philippines Energy Department in implementing building-related EE programmes for lighting systems, household appliances, and passenger and commercial vehicles. They estimate building EE measures could generate potential annual savings of 3.6 billion pesos (74.5 million USD).

Large property groups. The Philippines real estate market is characterized by several large property groups, including Ayala, SM, Robinson, Filinvest and Megaworld. These property groups develop large scale office buildings, malls, and residential housing (condominiums), and several of them have also developed internal capacity for energy services, performance contracting and financing of efficiency projects in new construction, as well as in retrofits of their existing building stock.

As the new middle class in the Philippines continues to grow a shift is evident towards a preference for living in more integrated living spaces. Mixed use developments offer access to facilities for living, working, and playing. As this continues, property ownership of these developments tends to be with the larger real-estate companies.

Vietnam

[8] The Energy Service Company Association of the Philippines was founded in May 2005, and PE2 was established in 2016 as its successor, in the form of a non-profit civil society organization. See www.p2e.org.

Industry

Stakeholder	Description and role
Private consultancy entities (ESCOs/Research institutions)	There are a number of private consultancy entities providing energy efficiency advisory services. At the moment, The ESCO market in Vietnam is still not well developed; MOIT is continuing to pilot ESCO models and has an ESCO establishment and registration process. Other barriers facing ESCOs include cheap energy costs and low awareness of energy efficiency; high transaction costs for relatively small projects; high perceived risks; and a legal framework and enforcement that does not strongly support the EPC approach.
Associations	Active associations of large energy-using industrial sectors include the Vietnam Steel Association (VSA), Vietnam Cement Association (VNCA), Vietnam Fertilizer Association (VNFAV), Vietnam Pulp and Paper Association, and Vietnam Association of seafood exporters and producers (VASEP). These associations play a key role to promote energy efficiency in member's enterprises and broadcast the results.
Japan International Cooperation Agency (JICA)	JICA is a long-standing supporter of energy efficiency in Vietnam and has assisted with studies on national energy master planning to (a) develop the National Energy Master Plan to 2050 including energy security, power sources, emission, energy efficiency, renewable energy, etc.; (b) develop a national database for socio-economic and energy data; (c) build capacity of bodies under MoIT.
United Nations development program (UNDP)	UNDP has been supporting Vietnam since 1977 and energy and environment is one of the focal areas for the UNDP's work in the country, composed of six integrated components: (i) policy and institutional support development; (ii) communications and awareness; (iii) technical capacity development; (iv) energy-efficiency services provision support; (v) financing support; and (vi) demonstrations. UNDP also supported industrial activities under advanced preparation: national clean production program for Vietnam; capacity building for implementation of the energy conservation law, and promotion of Energy Management Standards via the proposed ISO50001 Energy Management Standard.

The World Bank Group (WB)	The World Bank and IFC have actively supported industrial efficiency, through for example the IFC Vietnam Cleaner Production and Energy-Efficiency Program (CPEE), and the VEEIEs program. The WB is still providing technical support through VEEIEs, and the Vietnam Scaling Up Energy Efficiency Project. The Bank also indirectly supports EE efforts through GHG emission reduction activities for MOIT.
Asian Development Bank (ADB)	ADB has launched various technical assistance programs to promote energy conservation in industrial sectors in Vietnam, including (i) industrial surveys of energy consumption; (ii) energy management training; (iii) energy audits in selected intensive industrial sectors, e.g. steel; (iv) training ESCOs and energy conservation service providers; (v) studies into feasible financing mechanisms to promote energy efficiency in Vietnam.
Danish International Development Agency (DANIDA)	DANIDA's programs in Vietnam are long-standing and focus on three thematic areas that include (a) urban and industrial environmental management, (b) sustainable energy, and (c) management of natural resources. Danish programs generally aim to build capacity and knowledge in Vietnamese institutions and to target key sectors identified by the Vietnamese government. DANIDA has approved a multiyear technical assistance program to directly support MOIT's energy efficiency program, focused primarily on technical training for energy managers and auditors or consultants, industrial energy audits, and economic incentives for the implementation of audit recommendations.
United Nations of Industrial Development Organization (UNIDO)	UNIDO is mainly supporting Vietnam to apply and transfer low carbon and climate-friendly technologies toward green growth, including conducting advanced studies for several sectors, ISO50001 and EMS training, industry benchmarking, energy audits, etc.

Buildings

IFC EDGE Program.[9] The EDGE building certification has an active Vietnam program. As of October 2019, they have certified 1,581,890 square meters of floor space (Duong, 2020). They work closely with the Vietnam Green Building Promotion Program which advertises the benefits of green buildings to consumers and lobbies the government to offer incentives. Financial backers of the promotion program include Capital House, Phuc Khang Corporation, CEO Group, FLC Group and the Vietnam Real Estate Association.

ADB. The Vietnam Smart and Energy Efficient City Project (SEECP) began in late July 2020 and aims to help provinces and cities achieve their goals from VNEEP 3 and the Green /Smart Cities initiatives. SEECP supports building roadmaps for minimizing climate change impacts, implementing smart street lighting systems, and improving EE in public buildings. The six cities and provinces that have been chosen to participate are Can Tho, Da Nang, Ha Noi, Hai Phong, Quang Nam, and Quang Ninh.

[9] See https://edgebuildings.com.

UNDP.[10]The UNDP program, Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings in Vietnam (2016-2019), aims to reduce the intensity of GHG emissions in the building sector. The project objective is to improve energy performance in commercial and high-rise residential buildings in Ho Chi Minh and Hanoi through (1) improvement and enforcement of VEEBC; (2) building market development support initiatives; and (3) building energy efficiency technology applications and replications.

GIZ, AFD, and French Environment and Energy Management Agency (ADEME).[11] These donors manage the Programme for Energy Efficiency in Buildings (PEEB) in which Vietnam is one of the receiving countries. The lead executing agency in Vietnam is the Ministry of Natural Resources and Environment. The programme provides technical expertise and financial resources to support large-scale projects for increasing EE in buildings. The programme was initiated in 2017 and is expected to wind down at the end of 2020.

DANIDA.[12] DANIDA ran an EE project in Vietnam from 2013-2016 called "Low carbon transition in the energy efficiency sector". One of the two main components was focused on building EE and aimed to improve capacity for implementing EE in large buildings in line with the VNEEP energy savings targets of 5-8%. The implementing Vietnamese body was the Ministry of Construction.

APEC. APEC regularly runs workshops and seminars evaluating the Energy Efficiency programs in Vietnam. Their publications involve peer reviews of EE and low carbon energy policies in Vietnam. Other work includes training projects in-country on energy efficiency.

USAID Vietnam Clean Energy Program. The five-year USAID Vietnam Clean Energy Program (VCEP) ran between 2012-17, and had an overarching objective to accelerate Vietnam's transition to climate resilient, low emission sustainable development. The Program focused on energy efficiency in the building sector, and supported the Ministry of Construction to implement and monitor the Vietnam Energy Efficiency Building Code. VCEP trained over 3,000 government officials, practitioners and university lecturers on energy efficient, high performance building design; green building design and certification; commissioning of buildings to ensure that planned savings actually happen; and energy simulation software. The program also helped improve the operation of over 21 local organizations and institutions.

Other noteworthy initiatives include:

Vietnam Federation of Civil Engineering Associations (VFCEA). This organization developed the current Vietnam Energy Efficiency Building Code, while the Vietnam Green Building Council (VGBC) has developed and now administers the LOTUS rating tool, for more advanced green buildings.

ASHRAE. In February 2020, a Vietnam Chapter of the American Society of Heating Refrigeration and Air-Conditioning Engineers (ASHRAE) was established. ASHRAE Thailand is the host chapter of the new Vietnam section. ASHRAE administers educational seminars, training courses and exchange of best practices from the region for building practitioners.

ESCOs. The ESCO market in Vietnam is undeveloped. The Ministry of Industry and Trade (MOIT) is currently piloting ESCO models and has an ESCO establishment and registration process. MOIT and the Ministry of Finance are currently working together. Other barriers facing ESCOs include cheap energy costs, low awareness of energy efficiency, high transaction costs for relatively small projects, high perceived risks, and a legal framework and enforcement that does not support the energy performance contracting (EPC) approach.

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[10] See https://www.vn.undp.org/content/vietnam/en/home/operations/projects/environment_climatechange/energy-efficiency-improvement-in-buildings.html.

[11] See https://www.peeb.build.

[12] See https://vietnam.um.dk/en/green-growth/low-carbon-transition.