National Energy Efficiency and Conservation Plan (NEECP)

DRAFT

ENERGY UTILIZATION MANAGEMENT BUREAU

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Executive Summary

Background

The Philippines has witnessed a rise in energy consumption, driven by economic growth and a growing population in recent years. These trends are set to continue, with the transport and industrial sectors particularly driving the increase in energy demand. Although the Philippines continues to perform well compared to its ASEAN neighbours in terms of energy intensity (this has been attributed, at least in part to high, un-subsidised energy prices and a shift towards service and commercial industries), the rate of decline in energy intensity is slowing. Continued growth in GDP (it has been averaging 6-7%[1] annually over the past decade, except for the year 2020 which saw negative GDP growth due to the COVID-19 pandemic), and the energy-intensive industrial, building/construction, and transport sectors will see an acceleration in energy demand in the Philippines. The growth in the industrial sector is expected to grow the fastest at an annual average of 5.9%, or a three-fold increase in energy use from 2018 to 2040. This is driven in part by further governmental Programs aimed to boost developments in the manufacturing sector, and the 2018 'Build, Build, Build' initiative which will have a strong influence on further growth in the construction industry.

Until 2019, energy efficiency activities had generally been voluntary, with few incentives to support widespread adoption. In early 2019, the long-awaited Energy Efficiency and Conservation Act (EE&C Act) was enacted, putting in place the country's first law specifically relating to energy efficiency. The shift from voluntary to mandated activity, through the introduction of fines as well as incentives, is likely to have significant impact on energy efficiency action. This change also gives investors a clear indication of the government's commitment to scaling up energy efficiency across all sectors.

While the passing of the EE&C Act is a huge step forward for the Philippines Government and DOE, there is still much work to be done to implement its provisions. It is critical that comprehensive, clear and appropriate strategies and plans are developed to accelerate implementation and build investor confidence in the energy efficiency market.

The National Energy Efficiency and Conservation Plan

Enacted in the EE&C Act is a new National Energy Efficiency and Conservation Plan (NEECP); a national comprehensive framework and plan that institutionalises energy efficiency and conservation in the country, across key sectors. As per Section 4(z), the EE&C Act stipulates that the NEECP shall set out the "governance structure, Programs

[1] World Bank (2021) Data: GDP growth (annual %) – Philippines, available from https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2020&locations=PH&start=2011

for energy efficiency and conservation with defined national targets, feasible strategies, and regular monitoring and evaluation".[2] The plan is also required to be regularly reviewed and revised by DOE.

The Roadmap 2023-2050

The revised Philippines Energy Efficiency and Conservation Roadmap (2023-2050) (the Roadmap 2023-2050) provides an updated outline of the strategic plans and actions for EE&C in the Philippines across all sectors, including implementing key provisions of the EE&C Act, and its accompanying Implementing Rules and Regulations (IRRs).

The Roadmap aligns with the NEECP as it provides for the key Programs for energy efficiency and conservation by sector, for which emissions reductions targets and costings have been developed. Currently drafted and under review by the DOE, the NEECP Recommendations Report aligns with and builds on the draft Roadmap, additionally outlining the overarching structures and frameworks that enable the strategic actions of the Roadmap to be achieved.

The structure of this Recommendation Report follows that which is mandated by the Act (governance, Programs, targets, and monitoring and evaluation) and additional seeks to set a Vision for the plan as well. These are discussed below.

Under each of these sections of the report, the project team highlights suggested inclusions in the NEECP, and notes where there are information gaps.

Vision and Objectives

While not stipulated in the EE&C Act, vision and objective statements are important in providing all stakeholders and implementers with a high-level and strategic direction, aligning the various actors involved, and communicating the purpose and intentions of the country to accelerate EE&C.

The visions and objectives statement and its presentation in Figure 1 below are a suggestion that may be considered by DOE. The vision statement draws upon the EE&C Act's 'Declaration of Policy'[3], the EE&C Roadmap (2017-2040) Policy and Objective statements[4], and the Philippine Energy Plan (2018-2040)[5]. The objective statement has been drawn upon the overall purpose of the NEECP and its elements, as per the EE&C Act.

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[2] Philippines Republic Act No. 11285 - An Act Institutionalizing Energy Efficiency And Conservation, Enhancing The Efficient Use Of Energy, And Granting Incentives To Energy Efficiency And Conservation Projects, page 7

[3] Philippines Republic Act No. 11285 - An Act Institutionalizing Energy Efficiency And Conservation, Enhancing The Efficient Use Of Energy, And Granting Incentives To Energy Efficiency And Conservation Projects, page 1-2

[4] Philippines Energy Efficiency and Conservation Roadmap (2017-2040). Accessible from https://www.doe.gov.ph/sites/default/files/pdf/energy_efficiency/ee_roadmap_book_2017-2040.pdf

[5] Philippine Energy Plan (2018-2040) Accessible from: https://www.doe.gov.ph/sites/default/files/pdf/pep/Philippine%20Plan%202018-2040.pdf

Vision

To enact the Energy Efficiency and Conservation Act and institutionalize energy efficiency and conservation as a national way of life geared towards the efficient and judicious utilization of energy across all sectors

Objectives

The objectives of the NEECP are to:

- Provide a national framework to institutionalise the EE&C Act
- Define and outline all EE&C Programs to be implemented, their objectives and associated emission reduction targets over various time horizons
- Provide a governance structure that brings together all key stakeholders and define their respective roles in fulfilling the provisions of EE&C Act
- Provide a Monitoring and Evaluation (M&E) framework against the strategic actions of the National EE&C Roadmap 2023-2050 to track performance against pre-defined targets and provide a basis for learning and improvement

Figure 1: A suggested Vision and Objectives statement and presentation for inclusion within the NEECP

Governance

As with any national plan or strategy, a governance structure is key. It helps centre the approach, ensuring clear lines of cooperation and understanding of respective roles in the NEECP implementation. In line with best practice, a governance structure, especially in the context of a public-facing document such as the NEECP, should be simple, straightforward, and yet comprehensive. It should incorporate both a diagram to illustrate interactions between the various actors, and a descriptive outline of roles and responsibilities of actors per sector/Program. Given the multi-faceted and complex nature of national plans, various types of actors of shall be involved and hence the recommendations include both state and non-state actors.

Figure 3 outlines the suggested Governance framework for inclusion within the NEECP

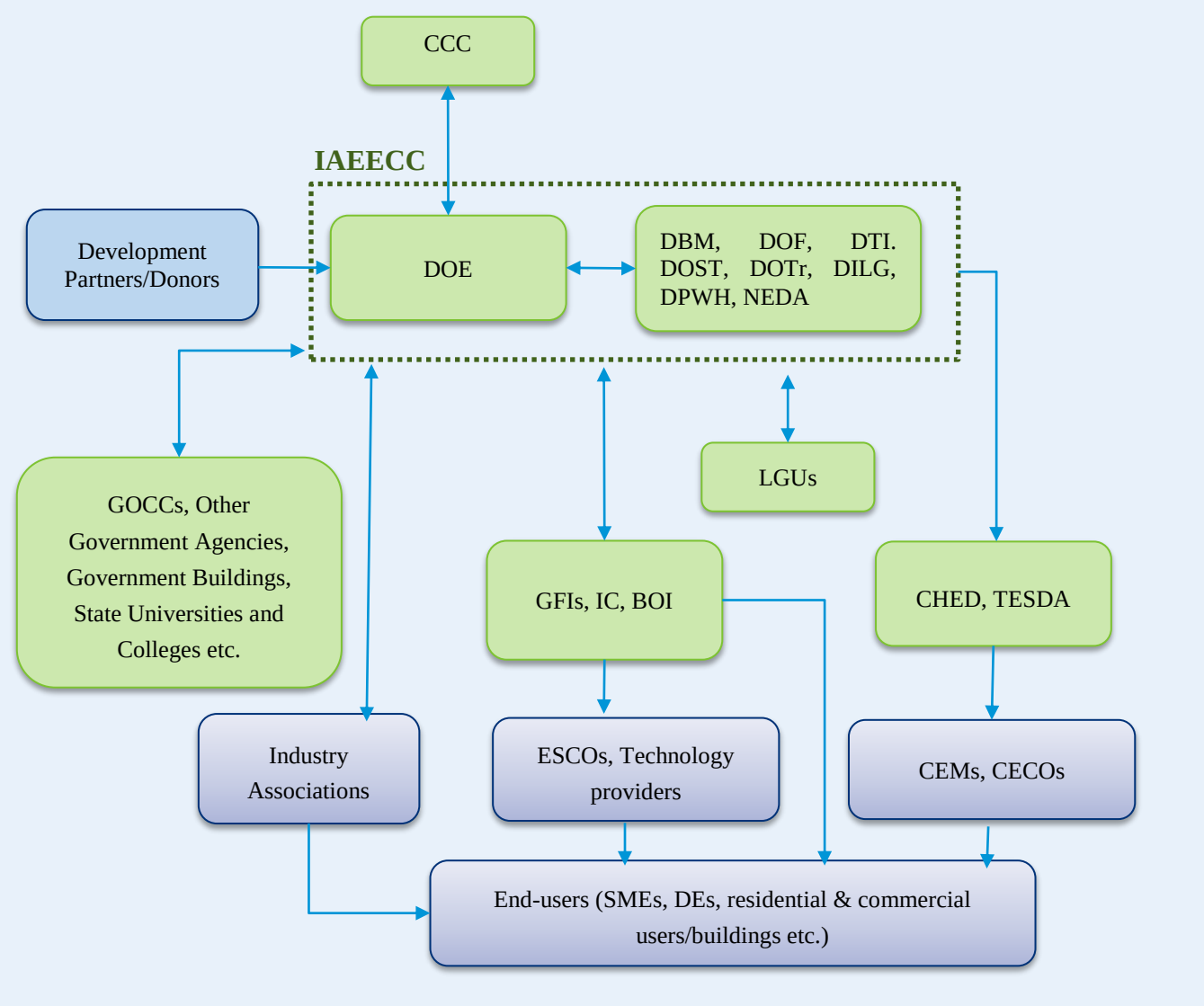

Figure 2: Governance Framework of the NEECP

Targets

Based on desk-based research and the data inputs from DOE, carbon emissions savings and targets were derived for each sector and Program, across the short, medium and long-term time horizons.

Table 1: Sectoral targets per Program over the short-, medium- and long-term

Sector	Program	Short Term Emissions Savings (203 – 2025)	Medium Term Emissions Savings (2026 – 2030)	Long Term Emissions Savings (2031 – 2050)
Government	Government Energy Management Program (GEMP)	1.87 Mt CO2e 16.15%	3.31 Mt CO2e 15.81%	25.06 Mt CO2e 14.48%
Commercial	Philippine Energy Labelling Program (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%

Programs

Closely tied to the NEECP is the National EE&C Roadmap 2017-2040. In recent years, the Roadmap 2017-2040 guided Philippines and DOE in EE&C and incorporated various sector-specific and cross-sector Programs for EE&C. These Programs had been earlier prioritised by DOE, with specific actions/activities tied to them. With the passing of the EE&C Act and introduction of new provisions, the Roadmap has since been updated by the ASEAN Low Carbon Energy Program (LCEP) with new Programs as stipulated in the EE&C Act, thus forming the Roadmap 2020-2040 as presented in Figure 3 below.

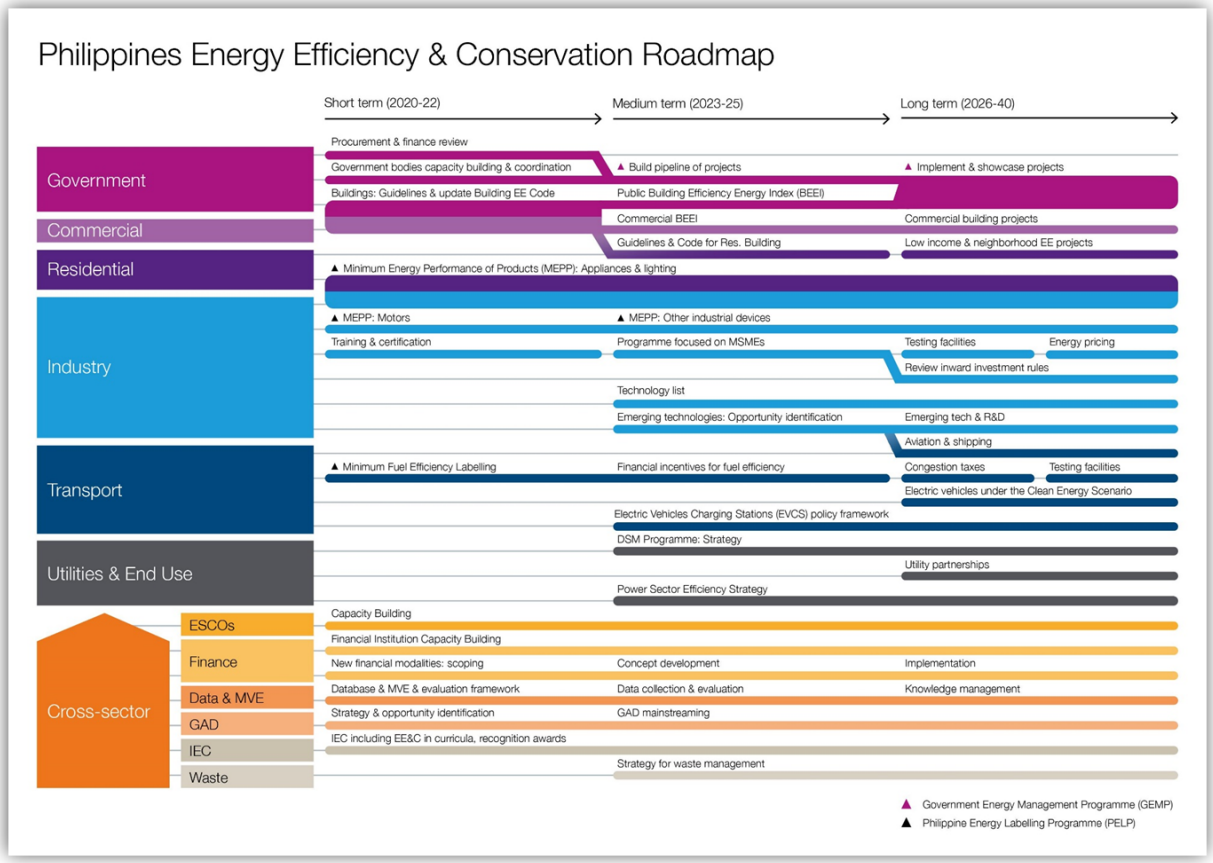

Figure 3: The updated EE&C Roadmap 2023-2050

Monitoring and Evaluation (M&E) Framework

Much of a plan's success can be attributed to a detailed M&E framework that allows for tracking of performance, with well-defined activities tied to measurable performance indicators and targets that are time-bound. In this case, it is recommended that the activities reflect and align with the Programs of the Roadmap 2023-2050. Further, activities that extend into the medium or long-term should include interim targets to facilitate a phased and stepwise approach to achieving targets. In line with best practices, it is also recommended that strategic actions/activities under each EE&C Program are further assigned responsible entities, and a budget that will inform DOE and relevant departments in planning of necessary resource and manpower allocations.

Data Gaps and Limitations

It is important to note that due to limited data availability and limited engagements with DOE and other stakeholders, the recommendations in this report shall be reviewed and validated by DOE. Where required, data gaps and inputs from DOE are flagged in blue text boxes before the start of the relevant sections.

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Abbreviations

AFETD	Alternative Fuels and Energy Technology Division
AFF	Alternative Fuels Fund
BAU	Business as Usual
BEEC	Building Energy Efficiency Code
BEEI	Building Energy Efficiency Index
BOI	Board of Investments
CCC	Climate Change Commission
CECO	Certified Energy Conservation Officers
CEM	Certified Energy Managers
CES	Clean Energy Scenario
CHED	Commission on Higher Education
DAP	Development Academy of the Philippines
DBM	Department of Budget and Management
DBP	Development Bank of Philippines
DC	Department Circular
DE	Designated Establishment
DENR	Department of Environment and Natural Resources
DILG	Department of the Interior and Local Government
DO	Department Order
DOE	Department of Energy
DOF	Department of Finance
DOST	Department of Science and Technology
DOTr	Department of Transport
DPWH	Department of Public Works and Highways
DSM	Demand-Side Management

DTI	Department of Trade and Industry
DU	Distribution Utilities
EA	Energy Auditors
EC	Electric Cooperatives
EEE	Electrical and Electronic Equipment
ELI	Efficient Lighting Initiative
EPIMB	Electric Power Industry Management Bureau
EPMPD	Energy Efficiency and Conservation Program Management and Technology Promotion Division
EPPB	Energy Policy and Planning Bureau
EPRED	Energy Efficiency and Conservation Performance Regulation and Enforcement Division
EPSMD	Energy Efficiency and Conservation Public Sector Management Division
ERC	Energy Regulatory Commission
ERDB	Energy Resources Development Bureau
ESCO	Energy Service Company
EU-ASEP	EU-Philippines Access to Sustainable Energy Program
EUMB	Energy Utilisation Management Bureau
EV	Electric Vehicle
EVCS	Electric Vehicle and Charging Stations
FECRT	Fuel Conservation and Efficiency in Road Transport
FI	Financial Institution
GAD	Gender and Development
GBR	Green Building Rating
GDP	Gross Domestic Product
GEEP	Government Energy Efficiency Projects
GEMP	Government Energy Management Program
GHG	Greenhouse Gas
GOCC	Government Owned and Controlled Corporation
IAEECC	Inter-Agency Energy Efficiency and Conservation Committee

IC	Insurance Commission
IEA	International Energy Agency
IEC	Information and Education Campaign
IRR	Implementing Rules and Regulations
LBP	Landbank of Philippines
LCEP	Low Carbon Energy Program
LEECP	Local Energy Efficiency and Conservation Plan
LGU	Local Government Unit
M&E	Monitoring and Evaluation
MC	Memorandum Circular
MEPP	Minimum Energy Performance for Products
MVE	Monitoring, Verification and Enforcement
NDC	Nationally Determined Contributions
NEA	National Electrification Administration
NEDA	National Economic and Development Authority
NEE&C Office	National Energy Efficiency and Conservation Office
NEECD	National Energy Efficiency and Conservation Database
NEECO	National Energy Efficiency and Conservation Officer
NEECP	National Energy Efficiency and Conservation Plan
NGA	National Government Agency
NPC	National Power Corporation
NRLP	Nationwide Residential Lighting Program
OIMB	Oil Industry Management Bureau
PCW	Philippine Commission On Women
PDU	Power Distribution Units
PEEP	Philippine Energy Efficiency Program
PELP	Philippines Energy Labelling Program
PEZA	Philippine Economic Zone Authority

PGBC	Philippine Green Building Council
PIA	Philippine Information Agency
PIEEP	Philippine Industrial Energy Efficiency Project
REMB	Renewable Energy Management
SME	Small, Medium Enterprise
SUCs	State Universities and Colleges
TFEC	Total Final Energy Consumption
UNIDO	United Nations Industrial Development Organization
WEEE	Waste Electrical and Electronic Equipment
WMCRDS	Waste Management Collection, Recycling and Disposal Strategy

Background

This section provides a background of Philippines, drivers of EE&C and its sectoral energy consumption by total final energy consumption (TFEC), and the overall trajectory of energy in the coming years.

1.1 Country Context

The Philippines has witnessed a rise in energy consumption, driven by economic growth and a growing population in recent years. These trends are set to continue, with the transport and industrial sectors particularly driving the increase in energy demand. Although the Philippines continues to perform well compared to its ASEAN neighbours in terms of energy intensity (this has been attributed, at least in part to high, un-subsidised energy prices and a shift towards service and commercial industries), the rate of decline in energy intensity is slowing. Continued growth in GDP (it has been averaging 6-7%[6] annually over the past decade, except for the year 2020 which saw negative GDP growth due to the COVID-19 pandemic), and the energy-intensive industrial, building/construction, and transport sectors will see an acceleration in energy demand in the Philippines. The growth in the industrial sector is expected to grow the fastest at an annual average of 5.9%, or a three-fold increase in energy use from 2018 to 2040. This is driven in part by further governmental Programs aimed to boost developments in the manufacturing sector, and the 2018 'Build, Build, Build' initiative which will have a strong influence on further growth in the construction industry.

The Philippines has a strong history of commitments to energy efficiency, dating back to the early 1990s. The Department of Energy Act of 1992 (Republic Act 7638) made explicit the aim for "judicious and efficiency utilisation of energy" across energy intensive sectors. In 2004, the National Energy Efficiency Conservation Program was adopted, which served as the framework guiding the DOE's strategy in energy efficiency across all sectors.

Until 2019, energy efficiency activities had generally been voluntary, with few incentives to support widespread adoption. In early 2019, the long-awaited Energy Efficiency and Conservation Act was enacted, putting in place the country's first law specifically relating to energy efficiency. The shift from voluntary to mandated activity, through the introduction of fines as well as incentives, is likely to have significant impact on energy efficiency action. This change also gives investors a clear indication of the government's commitment to scaling up energy efficiency across all sectors.

While the passing of the Law is a huge step forward for the Philippines Government and DOE, there is still much work to be done to implement its provisions. It is critical that comprehensive, clear and appropriate strategies and plans are developed to accelerate implementation and build investor confidence in the energy efficiency market.

1.1.1 Key Drivers of EE&C in Philippines

[6] https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2020&locations=PH&start=2011

Energy efficiency and conservation strategies and policies have become a global necessity. The International Energy Agency (IEA) has made energy efficiency a top priority, considering it a "first fuel: the fuel you do not have to use … abundantly available and cheap to extract"[7]. This is especially relevant for the Philippines, as energy demand is increasing due to high rates of urbanisation and a fast-growing population. Energy efficiency results in lower pollution, enhanced energy security, and lower energy costs, making it key to supporting economic growth. Energy efficiency also plays an important role in decoupling economic growth from energy demand and emissions, making it critical to sustainable development in the Philippines. This is aligned with the Updated Philippines Development Plan (2017-2022) that lays down medium-term plans geared towards the long-term vision of a building a resilient society with sustained future growth.

The Philippines has among the highest energy prices in Asia. Reducing energy costs through the implementation of energy efficient products has the potential to free up capital, which businesses can use to further grow their organisation and stimulate wider economic development. Reducing energy costs in households would enable increased spending on other basic needs, thereby improving conditions for low-income and vulnerable groups.

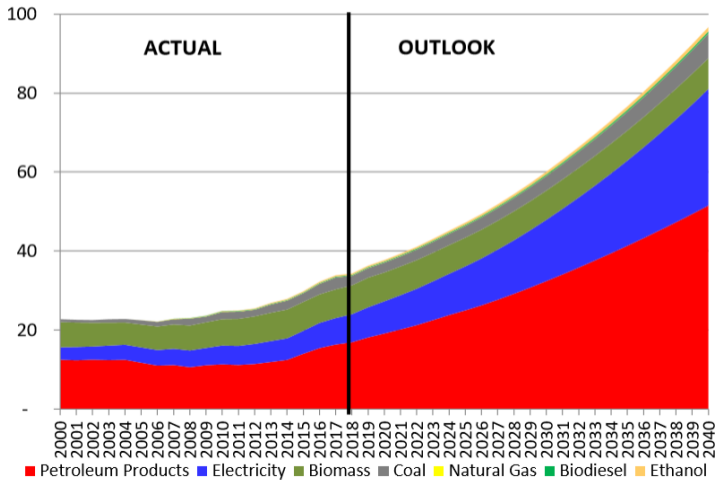
Energy security and self-sufficiency is also a high priority in the Philippines. As a net energy importer with only moderate conventional energy resources available, a lessened reliance on energy imports is a further driver for energy efficiency.

Alongside the economic benefits, there are important environmental and sustainable development considerations. Energy efficiency plays an important role in decoupling economic growth from energy demand and emissions, making it critical for reducing air pollution, and for emissions reductions - supporting the country to meet its Nationally Determined Contribution (NDC) commitments. Submitted on 14 April 2021, Philippines' NDC commits to a projected greenhouse gas (GHG) emission reduction and avoidance of 75% between 2020 and 2030 as compared to the business-as-usual scenario - 2.71% of which is unconditional and 72.29% is conditional on aid.

1.1.2 Energy Consumption in Philippines

Energy consumption in the Philippines has been increasing since 2005. The rate of this increase has also been accelerating since 2014. Population growth and economic development have been the primary drivers of this trend. With both factors showing further forecast growth it is likely energy consumption will on this upward trajectory. As is shown in Figure 4 below, the increase in energy consumption in recent years has been greatest in oil products. Oil products are expected to continue to have a high average annual growth rate until 2050.

[7] https://www.iea.org/commentaries/energy-efficiency-is-the-first-fuel-and-demand-for-it-needs-to-grow



	2018		2040		AAGR
	MTOE	% Shares	MTOE	% Shares	2018-2040
Coal	2.4	7.0	6.2	6.5	4.4%
Natural Gas	0.1	0.2	0.1	0.1	0.4%
Petroleum	**16.9**	**49.3**	**51.5**	**53.2**	**5.2%**
Biodiesel	0.2	0.5	0.5	0.5	4.6%
Ethanol	0.3	1.0	1.1	1.1	5.4%
Electricity	**7.1**	**20.7**	**29.5**	**30.5**	**6.7%**
Biomass	7.3	21.3	7.8	8.1	0.3%
Total	**34.3**	**100**	**96.7**	**100**	**4.8%**

Figure 4 Total Final Energy Consumption (TFEC) by Source, Philippines, 2000 -2040 (source: Department of Energy, 2020)

The Philippine economy has been growing on average by 6-7% each year over the past decade. The national gross domestic product (GDP) reached US$ 361 billion in 2020, making it the third largest economy in Southeast Asia, behind Indonesia and Thailand. The increase in economic growth has been partly driven by the growing commercial and service sectors, accounting for almost 60% of the overall GDP. Further energy demand increases are expected from growth in the industrial, commercial, and domestic sectors across the entire country. In addition, with the electrification level at 92.96% in 2019, the current trends in household electrification indicate that the Philippines are on track to reach their target of 100% electrification by 2022.

Energy security and self-sufficiency is a priority in the Philippines. The Philippines is a net energy importer with only moderate conventional energy resources available. Net energy imports account for around half of the total primary energy supply, which is comprised of oil and oil products (63%), coal (36%), and a small amount of biofuel (less than 1%). Oil importation is driven by lower international crude oil prices and a stable domestic demand for oil products. As a net energy importer, the need for energy security is a further driver for energy efficiency.

1.1.3 Energy Intensity

Energy intensity in the Philippines is lower than in neighbouring countries. Although energy intensity continues to decline, the rate is slowing. Energy intensity is the most widely used aggregate metric for energy efficiency progress and is measured by changes in the ratio of GDP per unit of energy consumed. Compared with its neighbours, the Philippines' improvement in energy intensity has been strong, energy intensity has reduced by 40% since 2000, compared with the South East Asian average of 24% over the same period (see Figure 5, below).

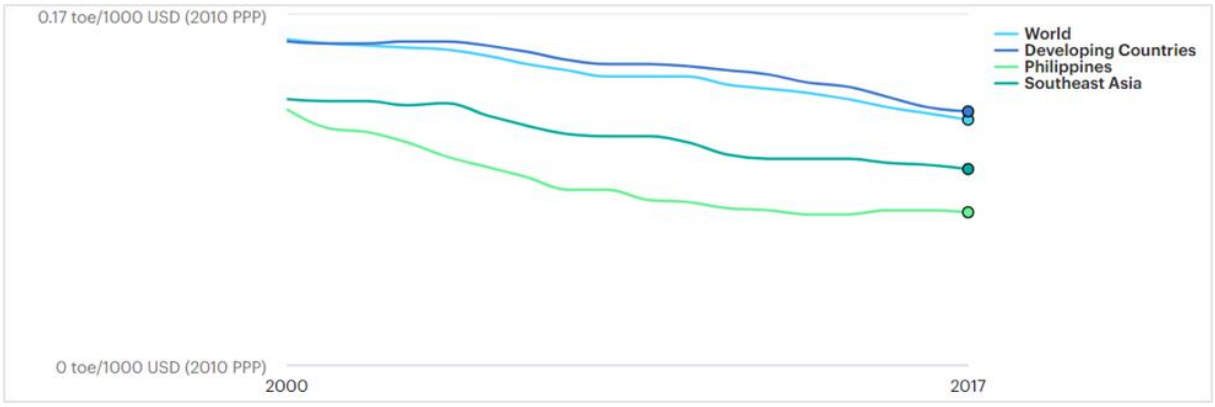


Figure 5: Energy Intensity measured in terms of primary energy and GDP, 2000-2017 (source: IEA, 2020)

The improvements have been attributed to a range of factors, including the impact of the country's high energy prices (Filipinos pay the second-highest electricity prices in Asia, and unlike its Asian neighbours Thailand, Indonesia and Malaysia, electricity rates in the Philippines are not subsidised by the government), and conservation policies in reducing demand. A strong driver of this trend is the country's shift toward less energy-intensive service/commercial industries compared with countries such as Vietnam and Thailand. Forecast growth in energy-intensive industries such as construction and transport indicate there will be a slowing decline in energy intensity.

The Philippine's total final energy consumption (TFEC) continues to grow year on year and has reached 34.31 Mtoe in 2018, which results in an average annual increase of around 6% over the past five years.

1.1.4 Energy Consumption by Sector

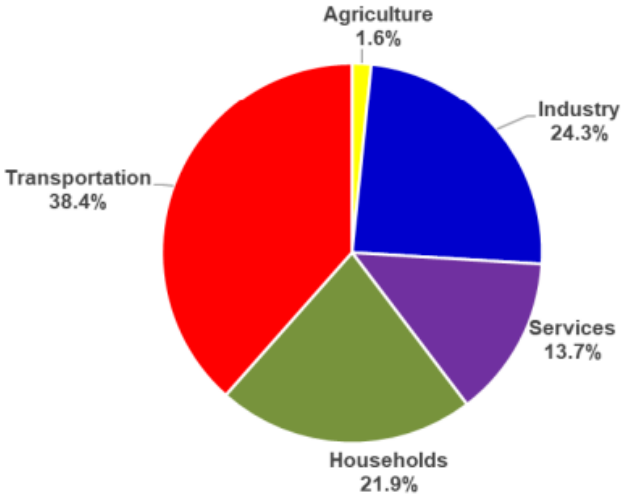


Figure 6: Total Final Energy Consumption by Sectoral Share (2018-2040)

The **transport** sector represents the largest share of the TFEC in the Philippines. The sector has experienced a sharp increase, particularly since 2014. Higher household incomes and historically low motorisation rates (number of vehicles relative to population size) have likely influenced growth in vehicle ownership, and a growth in contribution to the TFEC of the sector. Road transportation is by far the dominant subsector accounting for 98% of all passenger traffic and almost 90% of all transport-related energy consumption. Unsurprisingly, the sector is characterised by an

overwhelmingly share (96%) of oil products in its energy consumption mix. Even though road transport remains the largest contributor to this sector's energy consumption, railway and domestic air transport trends indicate a steady increase.

Industry represents the second largest share of the TFEC. Compared to the transport sector, there has been slower growth in energy consumption in the Industrial sector. The industrial sector can be divided into three major sub-sectors: manufacturing, mining and construction. Manufacturing leads in terms of energy consumption in the sector at 93%, followed by mining at 4% and construction at 3%. Within these, food processing and cement have shown the most significant growth in contributions to energy intensity (the cement industry used 2.7 Mtoe in 2017, 90% of which comes from coal, and food processing used 2.1 Mtoe, more than half of it coming from biofuels and waste). The contribution of mining to the growth in industrial energy consumption has declined, as evidenced by the closure of several mining firms in 2017, leading to an overall decline in production and output.

The **residential** (households) sector is the third-largest contributor to the TFEC, with a moderate growth in energy consumption. This trend is attributed mostly to the increased utilisation of electricity in the sector, coupled with improved living standards as a result of increased incomes. Energy consumption of the residential sector is characterised by a large share of biofuels/waste, particularly in rural areas. Biofuels/waste supplies more than half (53%) of the sector, the remainder is split between electricity (32%) and oil products (16%). With efforts undertaken to reach 100% energy access, the electricity share (total and relative) is growing continuously in the residential sector. Energy consumption in this sector is expected to increase, as more buildings are developed for housing.

The **commercial** sector takes up a smaller share of final energy consumption, at only 13.7% of the TFEC. However, energy consumption in this sector has increased rapidly due to strong economic growth. The commercial sector refers to non-manufacturing businesses. It includes commercial buildings, hotels, hospitals and schools. The sector is characterised by a high demand for oil products (47%) and electricity (45%), with biofuels/waste representing a small share at 8%. This is mainly due to the operation of (commercial) buildings. Appliances in these buildings, such as lighting or air-conditioning, contribute to energy consumption. Energy consumption by the commercial sector is expected to further increase in the coming years, with increased urbanisation and the construction of new buildings in the Philippines.

1.1.5 Energy Outlook

The country's total final energy consumption is forecasted to increase to 96.7 Mtoe in 2040. This is an almost 200% increase from 2018 levels. The transport sector is expected to remain the largest energy consumer, followed by the industrial and residential sectors. The growth in the industrial sector is expected to be one of the fastest at an annual average of 5.9%, driven in part by further governmental Programs aimed to boost developments in the manufacturing sector. The Government's 2018 'Build, Build, Build' initiative is also likely to have a strong influence on further growth in the construction industry, driving the demand for cement and basic metals. The US$ 180 billion infrastructure expansion Program is looking to develop and upgrade several airports, railways, rapid bus transits, roads, bridges and seaports across the country. The Program aims to enhance mobility, improve rural incomes, and create jobs.

The DOE has forecasted that the country's energy mix in 2040 will appear similar to the energy mix to date, with a strong emphasis on oil products (50%). This is due, in part, to the predicted continued demand for diesel and petrol from the transportation sector. While there have been Programs to test electric vehicles and the use of natural gas in

public transport, these have been limited. The limited infrastructure and regulatory barriers in place mean that it may be several years before the use of electric vehicles can be effectively scaled up.

Economic growth is projected to significantly decelerate in 2020 due to the impact of the Covid-19 pandemic. Nevertheless, it is expected to rebound in 2021-2022 as global conditions improve, and with more robust domestic activity bolstered by public investment momentum and the expected 2022 election-related spending. All of this will have a significant impact on the country's energy consumption profile in the near future.

As energy use continues to increase, the Philippine government has prioritised the development of a range of legislation and regulatory and policy instruments to increase the uptake of energy efficiency initiatives. Most notable has been the long-awaited enactment of the Energy Efficiency and Conservation Act, in April 2019, and its accompanying IRRs establishing the regulatory framework for energy efficiency and conservation in the Philippines.

1.2 EE&C Policy and Legislative Background

Energy efficiency and conservation is incorporated in several pieces of legislation and policies. Table 3 presents a summary of the relevant national policies and legislation in Philippines related to energy efficiency and an overview of its role in driving EE&C.

Table 2: Overview of EE&C policy and legislation in Philippines

Category	National Framework	Year	Overview
Energy Efficiency Regulations	EE&C Act	2019	The Energy Efficiency and Conservation Act (Republic Act No. 11285) came into force in early 2019, and is the first specific legislation underpinning energy efficiency and conservation. The long-awaited enactment of the EE&C Act has been welcomed by many energy efficiency experts and government officials. There are IRRs accompanying the EE&C Act. Pursuant to Section 36 of the EE&C Act, 31 Codes and Guidelines are to be issued following the release of the EE&C and its IRRs. At the time of writing, a handful of these had been developed.
Energy Efficiency Strategies	EE&C Roadmap 2023-2050	2023-2050	The *Philippines Energy Efficiency and Conservation Roadmap 2023-2050* sets out DOE's strategic plans and actions required to create a higher level of energy efficiency across all sectors. It states the overall objective "to support the country's economic development through efficiency gains and ensure energy security

			with a reduction in energy intensity across key economic sectors"[8]. The Roadmap integrates identified opportunities with existing energy efficiency policy instruments and strategies, and incorporates the priority goals of the current administration (2017-2022). The Roadmap is not, however, comprehensive in its setting out of all current DOE Programs related to energy efficiency. Existing public sector Programs, such as the Government Energy Management Program (GEMP), are not referred to in the Roadmap. Nor does the Roadmap align with the provisions of the EE&C Act. Many of the strategies in the Roadmap are not written into the Act.
	EE&C Roadmap 2023-2050	2023-2050	The *Philippines Energy Efficiency and Conservation Roadmap (2023-2050)* is the revised Roadmap which provides an updated outline of the strategic plans and actions for EE&C in the Philippines across all sectors, including implementing key provisions of the recent Energy Efficiency and Conservation Act and its accompanying Implementing Rules and Regulations. The UK Government, through the FCDO-funded ASEAN Low Carbon Energy Program (LCEP), provided technical assistance to the DOE to update the Roadmap 2017-2040
Energy Regulations	Energy Act	1992	Prior to the enactment of the EE&C Law in 2019, the Department of Energy Act of 1992 (Republic Act 7638) was the most relevant piece of over-arching legislation. The Act created the Department of Energy for all the functions and activities related to Energy and for other purposes. The Department of Energy is mandated to provide adequate, reliable and affordable energy to industries, to enable them to provide employment opportunities and low cost of goods and services, and to the ordinary citizen, to enable them to achieve a decent lifestyle.

[8] DOE (2016) Energy Efficiency and Conservation Roadmap 2017-2040

Energy Efficiency Standards	Philippine Standards and Labelling Program	2016	This supersedes the previous standards and labelling requirements, previously covered by Department of Trade and Industry now under the control of the Department of Energy. This sets out energy efficiency standards (scope, label, MEPS – if applicable) for the following products: • Air Conditioners • Refrigerating Appliances • Television Sets • Lighting Products
Electric Vehicles Regulations	Electric Vehicle Industry Development Act Republic	April 2022	The Act aims to establish a national energy policy and regulatory framework for electric vehicles (EVs) and installation of electric charging stations. DOE is responsible for the promotion of EVs, development of charging stations and harmonisation of policies and regulations on the use of charging stations with other government agencies. In the Philippine Energy Plan 2018-2040, the energy demand outlook considered the Clean Energy Scenario (CES) as an alternative to business as usual (BAU) assumptions. Under the CES, there will be a 10% penetration rate for EVs for road transport by 2040.

Additionally, as of the time of writing, all Memorandum Circulars (MCs), Department Order (DOs) and Department Circular (DCs) issued by DOE are summarised in **Error! Reference source not found.**4

Table 3: All energy efficiency-related issuances by DOE to date

	ITEMS FOR IMPLEMENTATION IN RA 11285	DATE OF EFFECTIVITY	RELATED PROGRAMS/ ISSUANCES
1	Implementing Rules and Regulations of RA 11285	12/21/2019	**Department Circular No. DC2019-11-0014:** Implementing Rules and Regulations of Republic Act No. 11285 or the EEC Act
2	Creation of Inter-Agency Energy Efficiency and Conservation Committee (DOE, DBM, DOF, DTI, DOTr, DPWH, NEDA are members)	01/09/2020	**Department Order No. DO2020-01-0001:** Organizing the Inter-Agency Energy Efficiency and Conservation Committee (IAEECC)
3	Operationalization of the Strengthening of the Energy Utilization Management Bureau (EUMB)	01/28/2020	**Department Order No. DO2020-01-0002:** Operationalization of the Strengthening of the Energy Utilization Management Bureau (EUMB), Support Services and Field Offices in Accordance with Republic Act No. 11285 or the EEC Act
4	Certification for Professional Competency and Accreditation for Professional Service Obligations of Certified Energy Conservation Officers and Certified Energy Managers	03/06/2021	**Department Circular No. DC2021-01-0001:** Guidelines for the Qualifications, Assessments, Registration and Certification of Energy Conservation Officers (ECO), Energy Managers (EM) and Energy Auditors (EA)

	Establish system for the assessment and certification of energy conservation officers, energy managers and energy auditors – Specifics to Training Regulations, Modules/Subject Curriculum or Syllabus		
5	Energy Labelling for Products and Equipment. Energy Product Device and Equipment Examination, Testing and Verification Develop guidelines for monitoring compliance to energy label and fuel economy performance	06/10/2020 11/21/2022	**Department Circular No. DC2020-06-0015:** Prescribing the Guidelines of the Philippine Energy Labeling Program (PELP) for Compliance of Importers, Manufacturers, Distributors and Dealers of Electrical Appliances and other Energy-Consuming Products (ECP) **Department Circular No. DC2020-11-0035:** Expanding the Coverage of the Philippine Energy Labeling Program (PELP) for Compliance of Importers, Manufacturers, Distributors and Dealers of Electrical Appliances and other Energy-Consuming Products (ECP)
6	Minimum Energy Performance	07/10/2020	**Department Circular No. DC2020-06-0016:** Prescribing the Minimum Energy Performance for Products (MEPP) Covered by the PELP for Compliance of Importers, Manufacturers, Distributors, Dealers and Retailers of ECPs

7	Certification of Energy Service Companies	10/09/2020	**Department Circular No. DC2020-09-0018:** Guidelines in the Administration, Classification of Energy Service Company (ESCO)
8	Energy Product Device, and Equipment Examination, Testing and Verification	07/10/2020 06/18/2021	**Department Circular No. DC2020-06-0015:** Prescribing the Guidelines of the PELP for Compliance of Importers, Manufacturers, Distributors and Dealers of Electrical Appliances and other ECP **Implementing Guidelines** of the PELP on Registration, Enforcement, Monitoring, Verification and Compliance Mechanism
9	Fuel Economy Performance for Transport Vehicles	12/12/2020	**Department Circular No. DC2020-10-0023:** Prescribing Policy Framework for the Development of the Fuel Economy Rating, Fuel Economy Performance, and Related Energy Efficiency and Conservation Policies for the Transport Sector and other Support Infrastructures
10	Energy Performance for Buildings	03/06/2021	**Department Circular No. DC2020-12-0026:** Adoption of the Guidelines on Energy Conserving Design of Buildings

11	Designated Establishments a. Type I – Annual Energy Consumption of 500,000 kWh to 4,000,000 kWh for the previous years b. Type II - Annual Energy Consumption of more than 4,000,000 kWh for the previous years c. Obligations of Type I and Type II Des Guidelines on Designated Establishments which computing consumption, procedure for compliance	06/11/2020	**Memorandum Circular No. MC2020-05-001:** Directing All Designated Establishments Under Commercial, Industrial and Transport Sectors to Submit Energy Consumption Reports
12	Provision of fiscal incentives to Energy Efficiency Projects Develop certification for endorsement to Board of Investments for entitlement to fiscal incentives	07/02/2021	**Department Circular No. DC2021-05-0011:** Guidelines for the Endorsement of Energy Efficiency Projects to the Board of Investments for Fiscal Incentives **Department Circular No. DC2022-03-0004**: Guidelines for the Endorsement of Energy Efficiency Strategic Investment to the Board of Investments for Fiscal Incentives
13	Energy Performance Standards – Transport Sector	08/19/2021	**Department Circular No. DC2021-07-0023:** Providing a Policy Framework on the Guidelines for the Development, Establishment,

			and Operation of Electric Vehicle Charging Stations (EVCS) in the Philippines
14	Government Energy Management Program (Government-wide program of reducing the monthly consumption of electricity and petroleum products by at least 10%)	10/24/2020 06/17/2021 10/07/2021	**IAEECC Resolution No. 1, s. 2020:** Directing All Government Agencies, including the LGUs and Foreign Service Posts, to Comply with GEMP, Ordering the Department of Energy to Conduct Energy Audits and Spot Checks, and Submit Proposed Improvements to the GEMP **IAEECC Resolution No. 2, s. 2021:** Directing All Government Agencies, including the LGUs and Foreign Service Posts, to use Energy Efficient Light Emitting Diode (LED) Lamps in Government Buildings and Facilities as a Requirement for Compliance to the Government Energy Management Program (GEMP) **IAEECC Resolution No. 3, s. 2021:** Directing All Government Entities including the LGUs and Foreign Service Posts, to Use Inverter Type Air-Conditioning Units or Similar Equivalent Technologies in Government Buildings and Facilities as a Requirement for Compliance to the GEMP

		12/16/2021 02/11/2022	**IAEECC Resolution No. 4, s. 2021** Enjoining The Council of Good Local Governance to Consider, Include and Adopt the Energy Efficiency and Conservation (EEC) as one of the Areas in the Criteria per Section 7 of Republic Act No. 11292-"The Seal of Good Local Governance Act of 2019". **IAEECC Resolution No. 5, s. 2022** Directing All Government Entities (GEs), including the Local Government Units (LGUs) and Foreign Service Posts to Observe the Approved GEMP Guidelines .
15	Demand Side Management Develop appropriate mechanism for direct benefit of the Energy End User which may include among others electrical safety standards and system reliability	2st Semester 2023	**Department Circular No. DC2014-08-0014:** Enjoining All Electricity-consuming Sectors to Implement Demand-Side Management Program and Other Energy Conservation Measures (08/14/2014)

			For Issuance of New Department Circular on Demand Side Management
16	Create, update the development of the National Energy Efficiency and Conservation Plan (NEECP) Develop monitoring system for targets under NEECP		For public consultation
17	Develop and maintain National Energy Efficiency and Conservation Database (NEECD)	Continuing	On-going database improvements for public access interphase
18	Develop and undertake a national awareness and advocacy campaign on energy efficiency and conservation	Continuing	Implemented in various IEC programs
19	Develop guidelines and procedures on the imposition and collection fees for accreditation and certification services	Continuing	Implemented in the various issued Department Circulars, Implementing Guidelines
20	Develop guidelines on Visitorial Powers and On-Site Inspections for Designated Establishments and Energy End Users	1st Semester 2023	Draft under development
21	Establishment of National Energy Efficiency and Conservation Office	Continuing	Filling of new positions affected by election ban
22	Endorsement of Government Energy Efficiency Projects Develop guidelines on the criteria for identifying government energy efficiency projects and standard for approval	04/07/2022	Included in the IAEECC Resolution No. 5, s. 2022 **Department Order No. DO2022-04-0006**: Guidelines on the Endorsement of Government Energy Efficiency Projects to the Inter-Agency Energy Efficiency and

			Conservation Committee Pursuant to the GEMP Guidelines
23	IAEECC to issue coverage of the GEMP and the use of savings, on buildings IAEECC to issue modalities on financial arrangements for government energy efficiency and conservation projects	22 March 2022	Included in the IAEECC Resolution No. 5, s. 2022 **Department Order No. DO2022-03-0005**: Guidelines on the Issuance of the Certificate of Energy Efficiency Cost Reductions
24	Develop fuel efficiency testing guidelines	25 March 2022	**Department Circular No. DC2022-03-0005**: Guidelines for the Recognition of Testing Laboratories for the Examination, Testing and Verification of the Energy Efficiency of Energy Consuming Products and Fuel Efficiency of Transport Vehicles, Including the Issuance of Certificate of Endorsement to the Board of Investment for Fiscal Incentives
25	Develop awards, recognition, and technical assistance programs as non-fiscal incentive	09/15/2021	**Department Order No. DC2021-09-0014**: Guidelines of the Energy Efficiency Excellence Awards
26	Establish third-party institution recognition for energy efficiency and conservation seminars for certified energy managers (CEM)	For publication	**Department Circular No. DC2022-0006**: Adoption of Training Regulations

			Certification Process for Energy Auditors **Department Circular No. DC2022-03-0007**: Adoption of Training Regulations for the Certification of Energy Conservation Officers **Department Circular No. DC2022-03-0008**: Adoption of Training Regulations and Prescribing Certification Process for Training Institutions and Energy Managers
27	Development of MEP for Sectors	1st Semester 2023	Ongoing analysis of submitted Energy Consumption Reports of Designated Establishments
28	Waste Management	2nd Semester 2023	On-going coordination with the Department of Environment and Natural Resources
	Energy Management Team	11th January 2023	**Department Circular No. DC2023-01-0001:** Institutionalizing the Energy Management Team to Develop an Energy Management System

2. Vision and Objectives

Vision

To enact the Energy Efficiency and Conservation Act and institutionalize energy efficiency and conservation as a national way of life geared towards the efficient and judicious utilization of energy across all sectors.

Objectives

The objectives of the NEECP are to:

- Provide a national framework to institutionalise the EE&C Act
- Define and outline all EE&C Programs to be implemented, their objectives and associated emission reduction targets over various time horizons
- Provide a governance structure that brings together all key stakeholders and define their respective roles in fulfilling the provisions of EE&C Act
- Provide a Monitoring and Evaluation framework against the strategic actions of the National EE&C Roadmap 2020-2040 to track performance against defined targets and provide a basis for learning and improvement

3. Governance

This section summarises the broader enabling frameworks relevant to EE&C (e.g. the EE&C Act, the Roadmap, and highlights the central role of the DOE/EUMB (reflecting the EE&C Act), noting the other agencies instrumental in the implementation of EE&C per the Act. It is also intended to highlight the roles of agencies and other entities in stakeholder engagements, public and private sector co-operation, and international development assistance for energy efficiency.

3.1 Enabling Frameworks of the NEECP

This section outlines the enabling frameworks for the NEECP including the EE&C Act, government decrees, energy efficiency strategies, and the EE&C Roadmap.

3.1.1 Energy Efficiency and Conservation Act 2019

The Energy Efficiency and Conservation Act (Republic Act No. 11285) (EE&C Act) came into force in April 2019 and is the first specific legislation underpinning energy efficiency and conservation. The long-awaited enactment of

the EE&C Law has been welcomed by many energy efficiency experts and government officials, having first been submitted to Congress in 1988 more than three decades ago. There is an IRRs accompanying the EE&C Act. Pursuant to Section 36 of the EE&C Act, 31 Codes and Guidelines are to be issued following the release of the EE&C Act and its IRR. At the time of writing, a handful of these had been developed through donor Programs and the DOE itself.

Although the Philippines has a strong history of commitments to energy efficiency, dating back to the early 1990s, the previous legislation and Programs consisted of voluntary measures rather than mandates. The Philippines lacked a strong overarching regulatory framework that would drive widespread adoption of energy efficiency and conservation initiatives. Prior to the enactment of the EE&C Law in 2019, the Department of Energy Act of 1992 (Republic Act 7638) was the most relevant piece of over-arching legislation. It stated that the DOE aims for "judicious and efficiency utilisation of energy" across energy intensive sectors. In 2004, the National Energy Efficiency Conservation Program was adopted, which served as the framework guiding DOE strategy in energy efficiency across all sectors. The new EE&C Act builds on these ambitions and activities, but also empowers, authorises and mandates the DOE's enforcement of energy efficiency, imposing mandatory requirements, and establishing key incentives. The DOE may now impose fines and penalties on entities that violate any provision of the law and its IRR.

In addition to strengthening DOE as the implementing body, the Act sets out the following key requirements:

- For key government departments and agencies to collaborate with DOE to implement the Act's provisions, including through the newly established Inter-Agency Energy Efficiency and Conservation Committee (IAEECC)
- For the certification and accreditation of individuals (energy managers) and entities (ESCOs) in accordance with new frameworks and requirements under the Act
- For energy-intensive organisations to develop energy efficiency plans and implement projects, and report their annual energy consumption to the DOE,
- For the development of MEPP for energy consuming products, for household appliances, in the commercial buildings, transport and industrial sectors
- For the DOE to pursue a DSM Program for the electric power industry
- For LGUs to take on more responsibility with respect to energy efficiency projects in their jurisdictions. LGUs are required to incorporate energy efficiency and conservation into their Development Plans.

3.1.2 Energy Efficiency Action Plan (EU Switch) (2016-2020)

EU-Switch was engaged by DoE to develop an Action Plan to further elaborate on, and establish parameters for the activities set out in the Roadmap. These were set out on a sector-by-sector basis, detailing resources, institutional arrangements, stakeholder engagement, and timeframes for completion.

The Action Plan tries to take a systems approach and consider a range of actors, policy instruments and market conditions that are needed to successfully implement the plan. Hence, the Action Plan positions the DOE as a coordinator, facilitator and technical advisor on energy efficiency, rather than as the lead implementer.

This Action Plan sets out an implementation plan for the Roadmap with focus on actions up to 2020 (corresponding to the short- and medium-term actions). It contains 39 recommended actions and timelines for DOE across the four main energy consuming sectors. It offers additional recommendation for cross-sectoral action that range from establishing a stronger institutional framework, building energy efficiency understanding and capacity in the finance sector, to establishing performance monitoring frameworks.

3.1.3 Energy Efficiency and Conservation Roadmap (2023-2050)

In recent years, the DOE had been guided by the Philippines Energy Efficiency and Conservation Roadmap 20-2040, which set out DOE's strategic plans and actions required to create a higher level of energy efficiency across all sectors. It states the overall objective "to support the country's economic development through efficiency gains and ensure energy security with a reduction in energy intensity across key economic sectors"[9]. The Roadmap 2023-2050 integrates identified opportunities with existing energy efficiency policy instruments and strategies, and incorporates the priority goals of the current administration (2017-2022).

The 2017-2040 Roadmap is not, however, comprehensive in its setting out of all current DOE Programs related to energy efficiency. Existing public sector Programs, such as the Government Energy Management Program, are not referred to in the Roadmap, nor does the Roadmap align with the provisions of the EE&C Act. Many of the strategies in the Roadmap are not written into the Act.

The Roadmap has thus been revised to reflect the updated priorities of the DOE, including most importantly, strategies to ensure the implementation and compliance with mandatory provisions in the Act. The revised Philippines Energy Efficiency and Conservation Roadmap (2023-2050) developed by LCEP provides an updated outline of the strategic plans and actions for EE&C in the Philippines across all sectors, including implementing key provisions of the EE&C Act, and its accompanying IRRs.

3.2 Provisions of the EE&C Act relating to NEECP

As the EE&C Act mandates the NEECP, Table 5 summarises the relation between these two documents. The relevant provisions in the EE&C Act relating or referencing the NEECP are highlighted.

Table 4: Provisions and inclusions in the EE&C Act that relate to the NEECP.

Inclusions in the EE&C Act	Relevant provision in the EE&C Act	Implementation status
Institutional Arrangements	**Chapter I- General Provisions, Section 4: Definition of Terms** (z) National Energy Efficiency and Conservation Plan (NEECP) refers to the national comprehensive framework, governance structure, and programs for energy efficiency and conservation with defined national targets,	The NEECP shall incorporate a governance structure. A structure with interactions been actors has been proposed within this recommendation report.

[9] DOE (2016) Energy Efficiency and Conservation Roadmap 2017-2040

	feasible strategies, and regular monitoring and evaluation	
	Chapter II - Roles and Responsibilities of Agencies	The EE&C Act outlines all the relevant government agencies' roles and responsibilities, LGUs and end-users. This recommendation report further includes other non-state actors.
Monitoring and Evaluation (M&E) **Targets**	**Chapter II - Roles and Responsibilities of Agencies, Section 5. Implementing Agency** DOE shall have the following powers and functions: (b) Develop a system of monitoring the implementation of the NEECP, including the targets that are established	The M&E framework in this report outlines the recommended structure for monitoring performance of energy efficiency activities, with time-bound targets. At the time of writing, DOE had also shared a list of goals and outcomes (see **Error! Reference source not found.**) for the purposes of the M&E framework. Emission savings targets tied to sectoral EE Programs have been defined in this recommendation report. These targets were developed using the accompanying Excel data tool

3.3 Institutional Arrangements

This section outlines the institutional arrangements around EE&C and the NEECP. Figure 9 illustrates the interactions between the key state and non-state actors, while the following subsections elaborate and explain their interactions and respective roles or responsibilities in more detail.

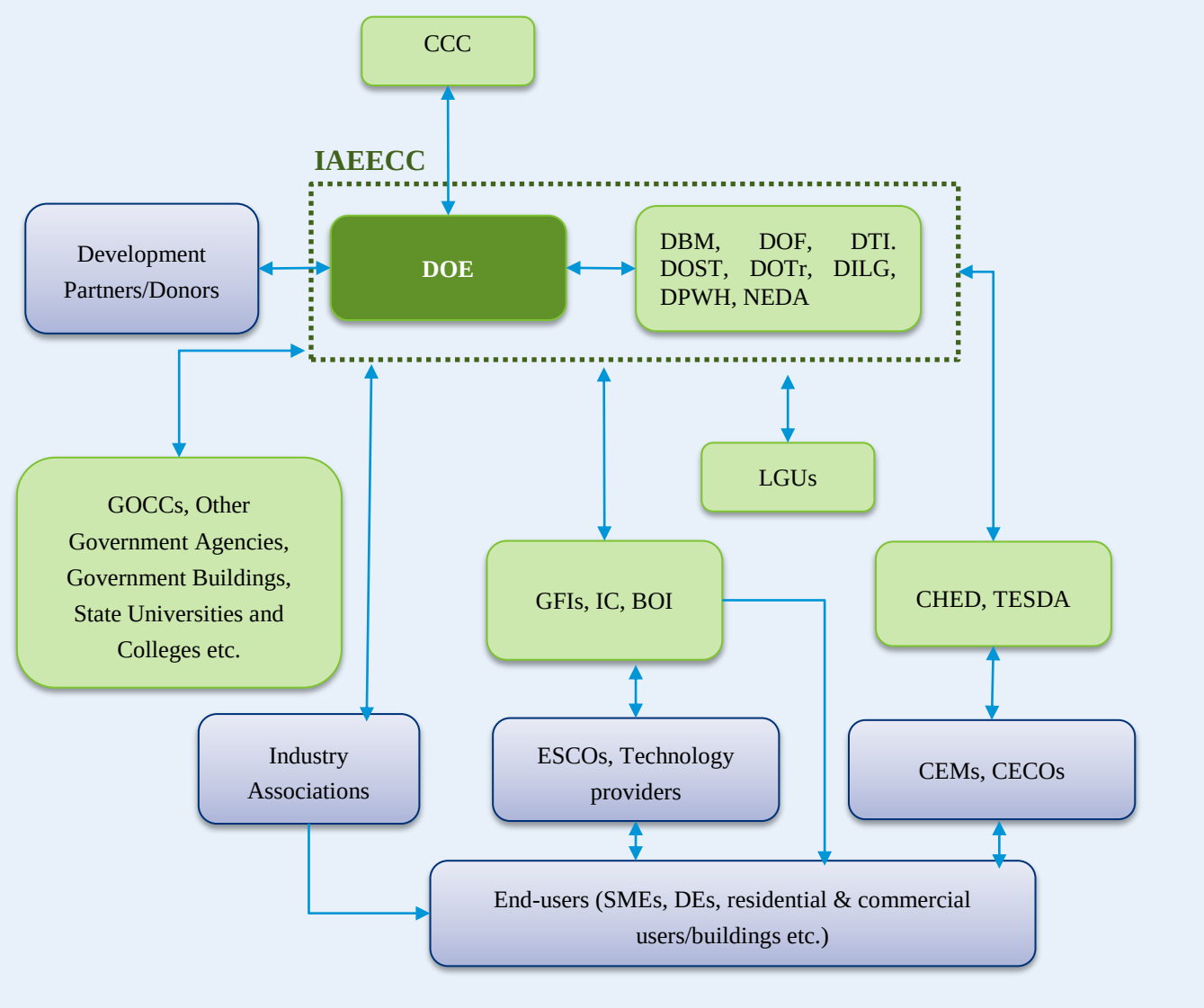


Figure 7: Governance Framework of the NEECP

Entities in green boxes relate to the state/government, while entities in purple boxes are non-state actors. The following sections provide more detail of the roles of each stakeholder in Figure 7.

3.3.1 Department of Energy

The EE&C Act positions the DOE as the **primary government agency responsible for the planning, formulation and development of energy management policies** and related energy efficiency and conservation programs. It requires the DOE to consult and coordinate with other government agencies and the private sector, or to create an interagency committee for the effective implementation of energy efficiency and conservation policies for the government.

DOE is also responsible for **updating, developing and maintaining the NEECP,** to ensure efficient evaluation, analysis, and dissemination of data and information for enforcement, planning, and policy-making purposes. DOE is also responsible for a **system of monitoring the implementation** of the NEECP, including the targets established.

Beyond these responsibilities, DOE has various sector and Program-specific responsibilities, together with other government agencies, which can be found in more detail in **Error! Reference source not found.**.

The DOE is one of 24 national government agencies under the Executive Office of the President, and is responsible for all policies, Programs, and activities of the Philippine Government relating to energy exploration, development, utilization, distribution, and conservation.

The DOE in turn is divided into six key bureaus:

- Energy Policy and Planning Bureau (EPPB)
- Energy Resources Development Bureau (ERDB)
- Electric Power Industry Management Bureau (EPIMB)
- Oil Industry Management Bureau (OIMB)
- Renewable Energy Management Bureau (REMB)
- Energy Utilization and Management Bureau (EUMB)

The key bureau for energy efficiency is the EUMB. The EE&C Act includes a provision for the strengthening and reorganisation of the EUMB. The EUMB now comprises the:

- **Alternative Fuels and Energy Technology Division (AFETD)**: AFETD oversees projects such as minimum energy performance for products (MEPP) for energy consuming products and energy labelling for particular products. Fuel efficiency testing and fuel economy performance also fall under this division.
- **Energy Efficiency and Conservation Program Management and Technology Promotion Division (EPMPD):** EPMPD is in charge of projects such as certification for ESCOs, energy managers and energy conservation officer. The EPMPD also looks at MEPP for Sectors, and Energy Conserving Design for Buildings.
- **Energy Efficiency and Conservation Public Sector Management Division (EPSMD):** EPSMD is in charge of the government energy efficiency management program and the endorsement guidelines for government financial institutions.
- **Energy Efficiency and Conservation Performance Regulation and Enforcement Division (EPRED):** EPRED is in charge of developing monitoring systems for targets under the NEECP, the compliance to MEPP and Energy Labels, as well as developing schedules of fines, penalties and violations under the EE&C Act.

3.3.2 Inter-Agency Energy Efficiency and Conservation Committee (IAEECC)

The EE&C act also created a new government body, the Inter-Agency Energy Efficiency and Conservation Committee (IAEECC), which oversees the implementation of the GEMP aimed at reducing electricity and fuel consumption by the government. The DOE- EUMB serves as the Secretariat for the IAEECC and leads the implementation of the GEMP. The Committee is composed of the Secretaries of the:

- Department of Energy (DOE)
- Department of Budget and Management (DBM)
- Department of Finance (DOF)
- Department of Trade and Industry (DTI)
- Department of Transportation (DOTr)
- Department of Science and Technology (DOST),
- Department of the Interior and Local Government (DILG), and
- Department of Public Works and Highways (DPWH)

and also includes the:

- Director General of the National Economic and Development Authority (NEDA).

3.3.3 Climate Change Commission

Outside of the DOE, the Climate Change Commission (CCC) is a policy-making government body, established in 2009 under the Climate Change Act, to coordinate, monitor and evaluate Programs and action plans for climate adaptation and mitigation in the Philippines. The CCC sits within the Office of the President and is the "sole policy-making body of the government which shall be tasked to coordinate, monitor and evaluate the programs and action plans of the government relating to climate change pursuant to the provisions of the Act". The CCC is responsible for the development of the Philippines' NDC.

Under the new EE&C Act, the CCC is mandated to collaborate with the DOE on establishing targets, formulating strategies, and monitoring and recording all GHG emission reductions resulting from EE&C projects in line with the NEECP.

3.3.4 Other Key Stakeholders and Roles

Table 5 outlines the roles and responsibilities of other key stakeholders involved in the governance of the NEECP, and as included in the framework (Figure 7), and how they interact with each other. More detailed sectoral-specific roles and responsibilities per sectoral Program are outlined in the Appendix.

Table 5: Roles and responsibilities of other key stakeholders of the NEECP

Stakeholders	Description and Roles/Responsibilities
Development Partners/Donors	Development partners/donors provide DOE/IAEECC with aid and technical assistance, such as capacity building and policy/regulatory reform related to energy efficiency. DOE/IAEECC are responsible for working closely with these partners, provide input where required.
GOCCs, National Government Agencies, Government buildings, State Universities and Colleges etc.	'End-users' of the GEMP that is driven by the DOE and IAEECC. They are responsible for ensuring compliance to GEMP and increasing energy efficiency in their buildings.
Government Financial Institutions (GFIs), Insurance Commission (IC), Board of Investments (BOI)	As per the EE&C Act, GFIs are obliged to set aside lending funds for EE projects at concessional rates of interest to attract private sector investments. GFIs and IC shall make available guarantee or insurance products to SMEs and ESCOs to mitigate credit risks and performance risks associated with these respective parties.

Local Government Units (LGUs)	LGUs are responsible for enacting the EE&C Act on a local level, through the development of their respective Local Energy Efficiency and Conservation Plans (LEECP), and have these validated with DOE and IAEECC. DOE and IAEECC shall provide support where needed.
Commission on Higher Education (CHED), Technical Education and Skills Development Authority (TESDA)	TESDA and CHED shall develop training regulations for the certifications of energy managers (CEMS) and energy efficiency and conservation officers (CECOs), promote energy efficiency practices through its Technical-Vocational Education and Training Programs, and implement skills training, assessment, and certification programs for mechanics, technicians, installers, and operators of energy efficient systems.
Industry Associations	Industry associations, such as the Philippine Appliance Industry Association, contribute to the development of MEPP and PELP, working together with DOE and end-users
ESCOs, Technology providers	ESCOs and technology providers provide a broad range of energy efficiency solutions and implement EE projects to end-users
Certified Energy Managers (CEMs), Certified Energy Conservation Officers (CECOs)	CEMs and CECOs shall be certified to for end-users such as Designated Establishments (DEs).
End-users (SMEs, Designated Establishments, residential & commercial users/buildings etc)	End-users cover a broad range of entities across the residential and commercial sectors, such as SMEs, DEs, and residential buildings. All energy end users shall use every available energy resource efficiently and promote the development and utilization of new and alternative energy efficient technologies and systems, including renewable energy technologies and systems across sectors in compliance with the declared policies of the EE&C Act.

4. Sectoral Targets

This section provides further background and context to the respective sectors, past and ongoing initiatives within each, and the projected emission reduction targets attributed to the sector and their EE&C Programs. Table 7 summarises them according to the time horizons of short-, medium- and long-term.

4.1 Economy-wide Targets

Submitted on 14 April 2021, Philippines' first NDC commits to a projected GHG emission reduction and avoidance of 75% over the 2020 -2030 period as compared to the business-as-usual scenario, 2.71% of which is unconditional and the remaining 72.29% conditional on aid. This represents the country's ambition across the key sectors of agriculture, waste, industry, transport, and energy. This commitment is referenced against a projected business-as-usual cumulative economy-wide emission of 3,340.3 MtCO2e for the same period.

4.2 Sectoral Status and Targets

Table 6: Summary of targets of each Program in the short-, medium- and long-term time horizons

Sector	Program	Short Term Emissions Savings (2023 – 2025)	Medium Term Emissions Savings (2026 – 2030)	Long Term Emissions Savings (2031 – 2050)
Government	GEMP	1.87 Mt CO2e 16.15%	3.31 Mt CO2e 15.81%	25.06 Mt CO2e 14.48%
Commercial	PELP/MEPPs	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	30.81 Mt CO2e	233.18 Mt CO2e

		19.38%	19.17%	18.35%
Transport	Fuel Efficiency Standards (PELP)	Pending data	Pending data	Pending data
	EVCS bill	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%

4.2.1 Residential

In 2018, the residential sector accounted for the third largest share of total energy consumption across the economy, at 21.9% of the country's total energy consumption. Despite this, the rate of increase in energy consumption has been moderate compared to other sectors like industry and transport, having only grown by 17% from 2013 to 2018. The growth in energy consumption in the residential sector has mostly been attributed to the increased use of electricity and LPG. In December 2016, around 90.7% of households (20.6 million) had access to electricity, which was up from around 87%, or around 16 million, in 2013. Increasing electrification rates and increasing incomes are also likely to have contributed to the higher demand for electricity.[10] Residential energy consumption in the Philippines is made up of three sub-sectors: space cooling and refrigeration (56% of consumption), appliances (18%) and lighting (11%)[11].

[10] Energy Demand and Supply Outlook (2018-2040), DOE, 2018

[11] EU Switch, policy review

4.2.1.1 Key Policies and Strategies

The DOE has pursued a suite of initiatives that have targeted residential buildings, as well as domestic appliances. Two key Programs that have been running for a number of years are the PELP which encompasses household appliances, and, through the Philippine Energy Efficiency Project (PEEP), the Nationwide Residential Lighting Program (NRLP).

Under the PELP, the DoE has developed MEPP standards for room air-conditioning units, refrigerators, television sets and a range of lights. The Program is set to be extended to cover electric fans and washing machines also. At the time of writing, the development of Star-rating labels for appliances was almost complete, with support from ASEP on the label design. Whilst such an initiative was already underway prior to the enactment of the EE&C Act, the Act specified additional information to be included on labels, meaning the launch date for the labels was pushed back. It is expected that they will be launched imminently.

Figure 8 Example of the recent Energy Efficiency Labels required to be displayed by certain products by DOE

The Government is keen to boost the level of local manufacturing, as so many appliances are currently imported. Illegal importing of sub-standard products without labels have been cited as a key challenge in this area. Furthermore, industry representatives have concerns about the additional costs that will be imposed on local manufacturers and importers.

Despite the prevalence of poorly insulated residential buildings in the Philippines, there has been limited work done to support the uptake of building envelope measures to date. Although Building Envelope Measures: Cool roofs and insulation, is set out in the current Roadmap as a short-term priority for DOE, little progress on this initiative has been made. While building envelope measures will be addressed in the forthcoming Guidelines on the Energy Conserving Design for Buildings, (a technical working group on Building Envelopes established to provide input into this document) these Guidelines are not likely to address residential buildings. It is, however and remains a longer-term strategy of the DOE for such Guidelines to include residential buildings. The Guidelines themselves are intended to be incorporated into the Building Code, which is updated by the DPWH.

4.2.1.2 Sector Targets

Sector	Program	Short Term Emissions Savings (2023 – 2025)	Medium Term Emissions Savings (2026 – 2030)	Long Term Emissions Savings (2031 – 2050)
Residential	**MEPPs**	18.56 Mt CO2e 34.65%	32.79 Mt CO2e 31.66%	248.21 Mt CO2e 23.17%

4.2.2 Commercial

Strong growth in building and construction of commercial buildings is expected to continue, driven by continued economic growth, and government priorities for inward investment. In the Philippines Energy Plan (2018-2040), the commercial/services sectors are expected to rise from 4,670 ktoe in 2018 to 14,070 ktoe in 2040, with electricity supply making up more than half of that energy demand. Commercial buildings in the Philippines account for a large proportion of this consumption of electricity; these buildings including offices, hotels and shopping malls. Tourism in the Philippines has grown, resulting in more and bigger hotels, and there has also been an increasing trend towards the use of commercial buildings over longer hours to support different energy uses such as for IT and data centre management.

4.2.2.1 Key Policies and Strategies

The EE&C Act includes reporting obligations for Type 1 and Type 2 high-energy users. The measurement, testing and verification of energy use will bring new challenges for buildings. This is a substantive body of work that will require stronger benchmarking of energy use in commercial (and residential) buildings, an enforcement regime, and reinvigorated coordination mechanisms between DOE and DPWH as the agency responsible for building codes. Currently under development are the Guidelines on the Energy Conserving Design for Buildings. These Guidelines are intended by the DOE, to be incorporated into the Building Code, which is updated by the DPWH

The DOE together with the Philippine Green Building Council (PGBC) has now developed the Green Building Rating (GBR) system, which looks to accelerate the use of efficient technologies and measures in building design (including roofs, insulation, etc.) to reduce energy consumption. The GBR system will also make benchmarking and monitoring of energy consumption of buildings easier.

4.2.2.2 Sector Targets

Sector	Initiative	Short Term Emissions Savings (2023 – 2025)	Medium Term Emissions Savings (2026 – 2030)	Long Term Emissions Savings (2031 – 2050)
Commercial	MEPPs	7.51 Mt CO2e 16.15%	13.28 Mt CO2e 15.81%	100.50 Mt CO2e 14.48%

4.2.3 Government

4.2.3.1 Key Policies and Strategies

Recognising its need to improve energy efficiency, the government has issued orders and circulars requiring the entire public sector to reduce energy consumption by at least 10%. Under the NEECP, the GEMP was established to help reach this goal. According to the DOE, based on over 590 government agency reports that were submitted since the establishment of the NEECP and GEMP in 2005, significant savings have been achieved across the public sector through energy saving initiatives.

The DOE has recognised the opportunity for it to act as a market leader and aims to share lessons from the experience with public sector buildings, particularly thought the roll-out of demonstration Programs. An example of this is in the retrofit of around 150 government buildings with energy efficient lighting, with support from the ADB. One of the key objectives of this was to demonstrate the return on investment of such retrofits for the commercial entities. The DOE has also been able to develop and test monitoring and reporting mechanisms through the GEMP, the lessons of which will be applied to the development of guidelines and templates for reporting (as required in the EE&C Act) across all sectors.

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4.2.3.2 Sector Targets

Sector	Initiative	Short Term Emissions Savings (2023 – 2025)	Medium Term Emissions Savings (2026 – 2030)	Long Term Emissions Savings (2031 – 2045)
Government	GEMP	1.87 Mt CO2e 16.15%	3.31 Mt CO2e 15.81%	25.06 Mt CO2e 14.48%

4.2.4 Industry

The industrial sector is the second biggest energy consumer in the Philippines, accounting for 25% of final energy consumption. Energy consumption in the sector is also increasing rapidly; industrial energy consumption rose from 25% between 2013 and 2018, from 6,439 ktoe to 7630 ktoe[12]. This represents a slight dip of 401 ktoe from 2017.

The subsectors with the highest energy consumption are non-metallic minerals (cement), followed by food and beverage. The cement production process requires a large amount of electrical and thermal energy, and cement factories are amongst the highest consumers of coal. Consumption in this sector is likely to continue to rapidly increase, with strong economic growth forecasts, population growth and urbanisation trends likely to continue, and the government's pursuit of its aggressive infrastructure building goals. According to the DOE's Energy Demand and Supply Outlook (2018), industry will consume 26,300 ktoe of energy in 2040.

4.2.4.1 Key Polices and Initiatives

Recognising the need to curb emissions and improve energy efficiency in the sector, the government has prioritised a number of key policies and Programs in the sector through the Roadmap (2017-2040). In the Philippines mandatory MEPP are already being applied to room air conditioners, refrigerators and lighting (CFLs and LFLs), with the development and adoption of MEPP for electric motors soon to follow. The new EE&C Act mandates that MEPP are developed, adopted and enforced in the industrial sector (in addition to commercial and transport). As yet, however, there are no MEPP, nor any guidelines on their adoption, or monitoring, verification and evaluation frameworks in place in relation to distribution transformers and electric motors. No schedule is yet available on when these MEPP might be adopted.

The GEF-funded UNIDO projects, the Philippine Industrial Energy Efficiency Project (PIEEP) provided trainings on Energy Management System and Systems Optimisation as well as capacity building on financing schemes. Trainings were offered to plant facility engineers and manager, individual consultants, energy efficient product suppliers and vendors, individual service provider engineers, among others. Walk-through plant assessment and audits were conducted to help energy efficiency project identification. Implementing Energy Management Systems were promoted

[12] IEA data, https://www.iea.org/countries/philippines

with the intention of having them be included in any corporate management guidelines, rules and policies of target companies.

The EE&C Act defines and sets out the obligations of designated enterprises to implement energy management systems (ISO 50001 or similar). They are also required to submit energy consumption reports, conduct energy audits and appoint certified energy managers or certified energy conservation officers depending on the type of establishment.

4.2.4.2 Sector Targets

Sector	Initiative	Short Term Emissions Savings (2023 – 2025)	Medium Term Emissions Savings (2026 – 2030)	Long Term Emissions Savings (2031 – 2050)
Industry	MEPPs (motors)	17.43 Mt CO2e 19.38%	30.81 Mt CO2e 19.17%	233.18 Mt CO2e 18.35%

4.2.5 Transport

Transport accounts for 37% of final energy consumption, the largest proportion of all sectors. Energy consumption for the transport sector in the Philippines has increased from 8,779 ktoe in 2013 to 12,281 ktoe in 2018[13], which presents a significant increase of 35%. This is partially due to an increase in energy demand for road transport, as more people purchased cars. The bulk of the energy for the transport sector comes from petroleum products.

There are various forms of transport, with varying levels of energy demand. Land transport services in the city are mainly in the forms of jeepney, tricycle, pedicab, bus, taxi, Light Railway Transit (LRT 1 & 2), Metro Rail Transit (MRT 3) and Philippine National Railways (PNR). Based on the DOE's Energy Demand and Supply Outlook (2018), road transport demand accounts for 88% of the energy demand in the sector. Water transport accounts for 6.9% of energy use, domestic air transport for 4.8% and railways for 0.1%.

According to the DOE's Energy Demand and Supply Outlook (2018), the demand for energy in the transport sector is expected to grow to 36,200 ktoe in 2040. It is expected that road transport will still account for the main share of this demand, as majority of domestic traffic and freight traffic is by land.

4.2.5.1 Key Policies and Strategies

[13] IEA data, https://www.iea.org/countries/philippines

Most transport policy decisions lie with Department of Transport and other urban development agencies, though there is some overlap in roles and responsibilities of different departments and agencies. Historically DOE has had influence in standards setting for fuel efficiency for motor vehicles, and has collaborated with DOTr in some Programs, however the passing of the EE&C Act now mandates coordination between the two departments. The Act requires DOTr work with both DOE and the Department of Environment and Natural Resources to ensure compliance of vehicle owners, manufacturers, and importers with the MEPP standards for transport vehicles. DOTr is also required to help enforce compliance with this and the requirement for vehicles to display energy consumption labels. At the time of writing, a Department Circular entitled Prescribing the Policy Framework for the Development of the Fuel Economy Rating, Fuel Economy Performance, and Related Energy Efficiency and Conservation Policies for the Transport Sector and Other Support Infrastructures, was in draft.

Prior to the passing of the Act, a number of energy efficiency initiatives had been pursued by DOE in the sector. These include the Fuel Conservation and Efficiency in Road Transport (FCERT) program, involving publicity campaigns promoting the conservation of transport fuels. 3,000 e-trike (electric tricycle) units were deployed under the Market Transformation through the Introduction of Energy Efficient Electric Vehicles Project, which had some support from ADB. At the time of writing, the DOE had signed four Memoranda of Agreement with LGUs and 36 Deeds of Donations with non-government organisations to extend this Program. Under the Next Generation Vehicle Package initiative, the DOE has been working with the Japanese Government, to promote hybrid electric vehicle uptake through demonstration of advanced Japanese vehicles. In mid-2019, under “The Natural Gas Vehicle Program for Public transport” which looks at the conversion of the bus fleet to compressed natural gas, DOE has issued Department Order (DO) No. 2019-07-0015 titled, Creation of the Special Financial Audit Team for the Alternative Fuels Fund (AFF). Recently, DOE has issued a Code of Conduct for the use of LPG and is currently drafting Guidelines on the Use of Next Generation Vehicles. DOE is working with UNEP and UNDP on developing policies and Programs related to E-mobility and EV infrastructure. The DOE continues to roll out information and awareness-raising campaigns, having conducted more than 40 IECs between 2018 and 2019 related to transport, including fuel economy, driver awareness and demonstration of key technologies.

Other areas of priority for the DOE include tax incentives for hybrid and electric vehicles, solar-assisted electric-powered boats particularly for tourism, EV infrastructure and research and development on emerging energy technologies. The DOE has provided inputs on the issue of tax incentives for EVs, for the implementing rules and regulations for the Tax Reform for Acceleration and Inclusion (TRAIN) Act, and has entered into MOAs related to these other areas.

Recently, the EVCS bill was published which aims to promote the use of electric vehicles, EE and reduce reliance on imported fuel. Under the bill, DOE is responsible for promoting the adoption of EVs, the development of charging infrastructure, harmonizing policies and issuing regulations on the use of charging stations in coordination with other agencies. The Department Circular for harmonisation all issuances shall be known as “Providing for a Policy Framework on the Guidelines for the Development, Establishment, and Operation of Electric Vehicle Charging Stations in the Philippines” or “Electric Vehicle Charging Stations Policy Guidelines.”

4.2.5.2 Sector Targets

Sector	Initiative	Short Term Emissions Savings (2021 – 2022)	Medium Term Emissions Savings (2023 – 2025)	Long Term Emissions Savings (2026 – 2040)
Transport	Fuel Efficiency Standards	Pending data	Pending data	Pending data
Transport	EVCS bill	Pending data	Pending data	Pending data
Transport	10% EV penetration by 2040	N/A	N/A	116.54 Mt CO2e 8.22%

4.2.6 Utilities and End-Use

The country's total peak demand in 2019 was recorded at 15,581 MW, which is 799 MW or 5.4% higher than the 14,782 MW in 2018. System losses from the generation, transmission and distribution between 2018 and 2019 increased by 988 GWh or 11%, due to the testing and commissioning of various power plants in the country.[14] System losses also accounted for 9.4% of total electricity sales and consumption in 2019.

4.2.6.1 Key Policies and Strategies

Demand-side Management and Power Sector Efficiency

The responsibility of every utility to develop and implement DSM plans is provided for under Section 4 of the Framework for Demand-side Management in the Philippines issued by the Energy Regulatory Board (ERB)[15], which outlines the main roles and responsibilities of DOE, ERB, utilities and consumers of electricity. It is aimed at the electric utilities' activities designed to encourage and influence their customers' use of electricity in ways that will produce desired changes to both the timing and level of electricity demand or load shapes.

As mandated by the EE&C Act, DOE, with the assistance of the Energy Regulatory Commission and the Philippine Economic Zone Authority, shall pursue a demand-side management Program for the electric power industry for the

[14] Philippines 2019 Power Situation Report. Accessible from https://www.doe.gov.ph/sites/default/files/pdf/electric_power/2019-power-situation-report.pdf

[15] Philippines Framework for Demand-Side Management In The Philippines (Appendix B). Accessible from https://www.raponline.org/wp-content/uploads/2016/05/phenergyregulatorycommission-dsmproposalappbdraft-caseno2001-55-2001-10-26.pdf

reduction of energy consumption through effective load management. This will aim to decrease power demand and achieve the migration of power demand from peak to off-peak periods. This will also include measures undertaken by distribution utilities to encourage end users to manage their loads.

4.2.6.2 Sector Targets

Sector	Initiative	Short Term Emissions Savings (2021 – 2022)	Medium Term Emissions Savings (2023 – 2025)	Long Term Emissions Savings (2026 – 2040)
Utilities & End use	Power Sector Efficiency	4.34 Mt CO2e 27.95%	7.53 Mt CO2e 27.95%	54.03 Mt CO2e 27.95%

4.2.7 Cross-sector

There are several key themes that are fundamental to the success of energy efficiency and conservation Programs and strategic actions in all sectors. Finance Programs support more effective use of public funding and support a private sector supply of finance for energy efficiency investments in all sectors. Educating and informing public sector bodies, financial institutions, industry groups, and the public at large enhance understanding of the importance of energy efficiency and the actions that consumers can take to improve it. Gathering data, and evaluating progress of energy efficiency Programs and actions in the Roadmap will be essential to gauge whether these are successful, and if not, where lessons can be learned and improvements made. Gender and Development (GAD) is mandated to be a fundamental consideration of any government energy efficiency and conservation projects, and this should follow in the private sector. Incorporating GAD into Programs across all sectors could have significant positive effects, not only on gender equality but in poverty alleviation and the strength of the MSMEs sub-sector. Finally, with energy efficient products rapidly replacing inefficient models, the DOE has made it a priority to address the management of such waste.

4.2.7.1 Key Policies and Strategies

4.2.8 ESCOs

An ESCO, or Energy Service Company, is a business that develops, installs, and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities. ESCOs provide much needed power engineering expertise, enabling power investors to concentrate more on their core business. The ESCOs also assist in budget stabilization, reducing risks in the market while implementing energy efficiency improvements.

Up until the EE&C Act and the release of Department Circular 2020-09-0018, ESCOs were not covered an accredited system. The Department Circular outlines the “certification requirements, review and evaluation process, and the classification of ESCOs, and states that ESCOs applying for certification must demonstrate their technical and managerial competence to design and implement energy efficiency projects, including energy audits, design

engineering, providing or arranging project financing, construction management, operations and maintenance of energy efficient technologies, and verifying energy savings".

This would open more doors for ESCOs to implement energy efficiency projects, on the back of the Efficient Lighting Initiative (ELI) by DOE, Development Bank of Philippines (DBP) and the Soluziona Philippines and International Finance Corporation that aimed to develop and promote model ESCO transactions.

4.2.9 Finance

Financing is a cross-cutting theme crucial to incentivise the uptake of energy efficiency projects, and is considered one of the most important factors in accelerating the global deployment of energy efficiency. A projected requirement of US$ 550 billion per year by 2035 is needed globally to unlock the potential of EE and its benefits[16].

The shift from voluntary to mandated activity through the EE&C Act, through the introduction of fines as well as incentives, is likely to have significant impact on EE action. This change also gives investors a clear indication of the government's commitment to scaling up energy efficiency across all sectors.

The two tables below show existing energy efficiency financing Programs and strategies, and finance provisions under under the EE&C Roadmap 2017-2040 (

[16] IEA (2014), World Energy Investment Outlook: Special Report. Available from: https://www.ourenergypolicy.org/wp-content/uploads/2014/06/WEIO2014.pdf

Table 7) and EE&C Act (Table 8) respectively.

Table 7: Energy efficiency finance Programs and strategies in the EE&C Roadmap 2017-2040

Policy, Program or Strategy	Description	Implementation
Collaboration with Stakeholders for Expanded Financing Models for EE&C Projects	Included in the EE&C Roadmap 2017-2040, this involves looking to international climate finance, government and leveraged loan finance, fund guarantees for risk sharing, fiscal policies in the forms of tax incentives and rebates, government grants and public-private finance from Energy Services Companies (ESCOs). In the EU Switch EE&C Action Plan 2016-2020, there were 3 particular elements suggested under CS-B: Energy Efficiency Revolving Fund and Finance Sector Capacity Building Program: - Establish an EE revolving fund - Create an EE finance program for the commercial bank sector - Coordinate an EE finance training program	There has been some limited collaboration with FIs such as DBP, LBP and the Bank of Philippine Islands (BPI) to explore these financing initiatives for EE. Under the UNIDO Philippines Industrial Energy Efficiency Project 2012-2019, the DOE conducted a workshop entitled 'Financing Capacity Development' targeting FIs, ESCOs, EE suppliers and vendors, as well as business and industry. No specific Program plans from the list of recommendations has been developed or tested with stakeholders.
Fiscal Incentives	Before the EE&C Act (discussed in the next table), the DOE had no direct mandate to provide financial incentives for EE. Through the Department of Trade and Industry's Board of Investments (DTI-BOI), the investment priority plan had allowed for financial incentives for energy efficiency upgrades (duty free importation of equipment and tax holidays on EE project revenues).	Before the Act came into effect, fiscal incentives were not widely taken up, and the means by which organisations could apply for these incentives were not clear. It was a recommendation of the EU-Switch Action Plan to raise awareness and clarify eligibility and the application process for these incentives.
IFC Sustainable Finance Program	This Program looked to address the barriers to EE finance, as well as those faced by renewable energy projects. It supported the development of new products and built capacity around assessing risks of loan applications. The banks involved in this Program included the two largest in the	The project closed in June 2017. The value of loans to EE projects was significantly lower when compared with renewable energy projects. It was reflected that the level of expertise in energy efficiency within the private sector has not been sufficiently developed. Despite funding a number of

	Philippines, BPI and Banco De Or as well as the Metro Bank and Trust Company	successful projects and a resultant portfolio of approx. US$300m, it has not created significant change in energy efficiency uptake. The average deal size remains in the $2-3m range. A range of recommendations were made by the International Finance Corporation at the conclusion of the Program, notably for increasing the capacity of FIs in the assessment of EE projects.

Table 8: Fiscal incentives and energy efficiency finance provisions in the EE&C Act

Provisions under the EE&C Act	Description	Implementation
Fiscal Incentives	Section 25 of the Act, and 71 of the IRRs stipulates that energy efficiency projects (certified by DOE) will be entitled to fiscal incentives in the form of tax benefits or tax holidays. The implication of the exemption under the Act from Article 32(1) of Executive Order No. 226 is that the incentives are open to foreign entities, encouraging foreign investment in energy efficiency	The Department of Finance (DOF) is required to, in coordination with the DOE, draw up appropriate mechanisms to implement the fiscal incentives under the Act. A Department Circular is due to be published on the Guidelines for the Endorsement of Energy Efficiency and Conservation Projects to the Board of Investments for Fiscal Incentives.
Concessional lending by GFIs	Under Section 6 of the Act, *Roles of Other Government Agencies*, GFIs are obligated to set aside lending funds for EE projects at concessional rates of interest to attract private sector investments. Compatible guarantee or insurance products are required to be made available in order to help mitigate credit risks associated with energy efficiency investments in small and medium-sized enterprises. The same applies to performance risks for projects developed by, engineering companies, and other technology providers.	Guidelines for the endorsement of projects for government financial institutions are in the process of being developed with the support of LCEP. The DOE will soon develop the proposed Department Circular to issue modalities on financial arrangements for government EE&C projects.

Further to the above, both the LandBank of Philippines (LBP) and DBP have their own existing lending Programs for energy efficiency projects. LBP's Program, called the Go Green Inclusive Finance for SMEs and LGUs ('Go Green'), offers loans to both EE and renewable energy projects, while the DBP's Energy Efficiency Savings Financing Program ('E2SAVE') offers loans primarily for energy efficiency projects.

4.2.10 Data and MVE

Accurate, timely and reliable data is fundamental to developing effective energy efficiency strategy and policy and plays a key role in implementation. It is critical to reducing the cost of monitoring and verification. It also supports awareness raising of the positive impacts of energy efficiency action.

Robust and comprehensive databases, combined with stable and enforceable data collection regimes and effective evaluation methods, support the development of an evidence base. They provide valuable insights into how energy is used, the drivers of consumption, and the impact of energy efficiency measures so that policymakers can better adapt and design their Programs to maximise their impact.

Historically, data and MVE systems have not been consistent or reliable across the board. For instance, there had been limited up-to-date data available on public sector energy consumption in Philippines and limited information on the total number of public sector buildings and facilities in the country.

4.2.11 IECs

The aim of this Program is the integration and mainstreaming of energy efficiency across all sectors, including in LGUs. The DOE has collaborated in particular with two other government agencies on this Program, the Philippine Information Agency (PIA) and the Development Academy of the Philippines (DAP). This has involved convening several forums, workshops and seminars. These events have been attended by representatives from the private sector, local government and other public officials, industry associations and academia, as well as interested members of the public. A number of initiatives have targeted LGUs and, in the last couple of years, workshops have been held to support local government to develop energy efficiency Programs for integration into Local Development Plans

The DOE conducts IEC campaigns on energy efficiency and conservation through E-Power Mo. The E-Power Mo is the DOE's vehicle to empower energy consumers and inform the public on available options for a wiser and more intelligent/sustainable use of energy. Nationwide, 51 IEC events took place with the theme "Energy Efficiency and Conservation".

4.2.12 GAD

Energy efficiency investments create public benefits in terms of lower greenhouse gas emissions, increased employment, energy security and improvement of the country, or communities fiscal balance. Energy efficiency is strongly linked to the Sustainable Development Goals through its economic, environmental, and social dimensions. Sustainable energy is addressed specifically in Goal 7, which is to "ensure access to affordable, reliable, sustainable and modern energy for all". However, access to, and use of energy is unevenly distributed among difference socio-economic groups. Similarly, the benefits arising from energy efficiency can accrue in such a way that some parts of society miss out.

The DOE has targeted certain groups through its Programs and strategies to ensure that they are able to benefit from energy efficiency, specifically low-income households, and women.

The Philippine Commission on Women (PCW), Office of the President, issued a Memorandum Circular No. 2011-01 which provides guidelines for the 'Creation, Strengthening, and Institutionalisation of the Gender and Development Focal Point Systems. The DOE issued a Special Order to reflect these systems in the Department. In 2019[17] a Department Order provided for the Reconstitution of the DoE Gender and Development Focal Point System, in line with the Implementing Rules and Regulation on Gender and Development.

4.2.13 Waste

While not directly contributing to energy efficiency, waste is a key issue emerging within the space. An increased roll out of more efficient technologies to replace older and obsolete technologies will lead to increased waste, (specifically referred to electronic-waste, or e-waste) generation and greater need for waste management. This would include recycling and circular economy strategies and capacities.

Most e-waste is handled by the informal sector such as waste pickers, and junkshop operators and a formal and comprehensive e-waste management system is still lacking in the country. In the 17th Congress, there are two bills filed to address e-waste management. The first bill is Senate Bill No. 568 (E-waste and Cellular Phone Recycling Act) authored by Sen. Antonio Trillanes and House Bill No. 5901 (E-waste Management Act)[18]. DENR and DOE had also released a Joint Administrative Order on Lamp Waste Management (JAO No. 2013-09-2001) to address the end-of-life disposal of lighting products and control the dispersion of toxic substances into the environment.

As of October 2020, DENR was set to issue a document of the Technical Guidelines on the Environmentally Sound Management of waste electrical and electronic equipment (WEEE) which aims to "provide the framework mechanism for the appropriate management of WEEE, reduce the amount of electrical and electronic equipment (EEE) type of

[17] DOE (2019). Department Order No. DO2019-03-0008. Reconstitution of the Department of Energy (DOE) Gender and Development Focal Point System (GFPS). https://www.doe.gov.ph/sites/default/files/pdf/issuances/do2019-03-0008.PDF

[18] Celestial, R.G.A *et al*., (2018). E-waste Management in Philippines (2018). Accessible from https://www.researchgate.net/publication/323356709_E-waste_management_in_the_Philippines

waste and the hazards brought about by its components, and promote the reuse of second-hand or used EEE and valorisation of its waste component"[19].

4.2.13.1 Sector Targets

There are no sector targets developed for cross sector initiatives as emission reductions attributed to these initiatives are not easily quantifiable.

4.3 NEECP Implementation Risk

The following table presents various risks that have been identified through the development of the NEECP. These risks may hinder the implementation of the NEECP and thus the targets of EE&C. These identified risks have been scored according to likelihood (risk rating) and severity (impact rating), on a scale of low, medium and high. Alongside each risk, mitigation actions have also been identified, and the responsible party for managing the risks/undertaking appropriate mitigation action.

Table 9: Suggested Risk Matrix of the NEECP

Identified risk	Risk rating	Impacts	Impact rating	Mitigation action	Responsibility
Inadequate financing	High	No budget set aside for investing in EE projects	High	Inclusion of budget of EE projects/activities within the investment plan	DOE, DBM, DOF
Operation Risk: Human resource	Medium	Lack of adequate capacity at DOE	Medium	Recruit and retain skilled staff, capacity building	DOE
Lack of data	Medium	Target-setting inaccuracies	High	Develop databases and systems of monitoring/data collection	DOE

[19] DENR (2020). EMB: National Policy, Regulatory Framework Already In Place For E-Waste Mngt. Accessible from https://www.denr.gov.ph/index.php/news-events/press-releases/1918-emb-national-policy-regulatory-framework-already-in-place-for-e-waste-mngt

Lack of coordination between stakeholders	Low	Low stakeholder understanding and involvement in NEECP implementation	Medium	Regular coordination meetings/stakeholder engagements	All parties
Political Risk	Low	Delay or no follow-through of the NEECP, change in ministries and roles	High	NEECP has been embedded in as a national law (EE&C Act)	DOE

5. Sectoral and Cross-sectoral Programs

This section describes the current status of various key Programs under the Roadmap 2020-2040, both sector- specific and cross-cutting ones.

5.1 Government Energy Management Program

Recognising its need to improve energy efficiency, the government has issued orders and circulars requiring the entire public sector to reduce energy consumption by at least 10%. Under the NEECP, the Government Energy Management Program was established to help reach this goal. The GEMP is the government-wide Program to reduce monthly consumption of electricity and fuel through energy efficiency and conservation measures, and the GEMP requires establishment of energy conservation programs and dedicated staff for each agency. DOE conducts awareness raising for government agencies, conducts spot checks on agencies for compliance with the requirements, and recognizes good performers.

According to the DOE, based on over 590 government agency reports that were submitted since the establishment of the NEECP and GEMP in 2005, significant savings have been achieved across the public sector through energy saving initiatives.

According to the Roadmap 2020-2040, GEMP will run through the short, medium- and long-term. To effectively build up a pipeline of GEMP projects, at both the national and Local Government Unit (LGU) level, the DOE aims to build the capacity of, and promote better coordination between, government entities. Specifically, capacity building of the IAEECC who evaluate and approve the development of GEMP will take place in the short-term. LGUs will similarly receive support for the identification and evaluation of energy efficiency projects, coordinated by the National Energy Efficiency and Conservation Office (NEEC Office), shortly to be established.

5.2 Buildings

The building sector is a one of the most energy-intensive sectors of the country. First completed in 2008, the Guidelines on the Energy Conserving Design for Buildings aim to encourage and promote the energy conserving design of buildings to reduce use of energy and prescribe guidelines and minimum requirements for the energy conserving design of new buildings and provide methods for compliance. It is intended that the guidelines would be used to update of the Building Energy Efficiency Code (BEEC), which will form part of the Philippine Building Code.

Currently under revision the new *Guidelines on the Energy Conserving Design for Buildings*, will be, in accordance with the EE&C law, mandatory for both new and existing buildings. State-owned buildings and facilities are required to comply, in accordance with the GEMP.

5.3 Philippine Energy Labelling Program/ Minimum Energy Performance for Products

The Philippine Energy Labelling Program is a large Program that has been running successfully for several years. The Program covers the development of Minimum Energy Performance for Products and labelling for appliances and other energy consuming products. Currently, the PELP covers products air conditioners (room), refrigerating appliances, televisions sets and lighting products.

The development and rollout of energy standards beyond the appliances sector remains a high priority for the DOE. These include technologies and industrial devices such as motors, and possibly transformers, which is widespread in use and energy consuming. Minimum fuel efficiency ratings and labelling for vehicles also fall under the PELP.

The updated Roadmap highlights the necessary actions to expand the PELP product/technology coverage, through the conduct of market assessment studies, establishing and harmonising standards in collaboration with experts and ASEAN countries respectively. Supporting measures to the PELP include a robust online registration system, a Monitoring, Verification and Evaluation (MV&E) framework, and post-market surveillance and monitoring.

5.4 Demand-side Management

The development of a demand-side management (DSM) Program is a requirement the EE&C Act. A DSM Program for the electric power industry would be pursued through load management and other measures implemented by distribution utilities to encourage end-users to manage their loads in an efficient manner. DSM adds system stability and reliability by paying users to voluntarily lower their demand during peak periods of high demand. A policy would first need to be developed and a strategy adopted by scoping out best practices in DSM and conducting extensive stakeholder engagements. The strategy would also identify industries and sectors which the Program should target to be most effective (e.g. industry, commercial, residential).

5.5 Power Sector Efficiency

This strategic action was included in a draft Roadmap presented for public consultation on 24th August 2020 by the DOE. This should be strongly linked to the DSM policy and follow the DSM Program, and the strategy would set out and prioritise cost-effective opportunities to reduce system losses and improve efficiencies and detail potential for cost-savings. Included in the previous Roadmap 2017-2040 as a medium-term priority, it remains a high priority for the DOE to be pursued within the next five years.

5.6 Fuel Efficiency Standards (under PELP)

This initiative falls under the PELP. Fuel economy performance labelling is addressed in the EE&C under Section 17, and requires that transport, vehicle manufacturers, importers, and dealers shall comply with fuel economy performance

labelling requirements set by the DOE with the assistance of the DENR and the DOTr. As part of this, the DOE will develop fuel efficiency testing guidelines to determine compliance.

5.7 ESCOs

ESCOs support the development of industrial energy efficiency projects, particularly as financial intermediaries who can create new financing pathways for projects in industry, the commercial sector, and public sector.

The capabilities of the ESCOs accredited under the DOE have varied widely. Before the passing of the EE&C Act into law, there had been limited development of the ESCO sector. The Act provides that the DOE shall strengthen the existing ESCO certification system and develop guidelines and procedures on the imposition and collection fees for accreditation and certification services.

In line with the release of the Department Circular No. DC2020-09-0018, and as outlined in the Roadmap 2020-2040 as a short-term strategic action, ESCOs require increased capacity building to undertake and implement EE projects. This would involve development of training modules, provision of an ESCO toolkit supporting standard processes to streamline procedures.

5.8 Finance

In order to achieve the wider ambitions of the EE&C Act, significant investment is needed for the successful implementation of EE projects in the Philippines. However, financial and technical barriers are constraining the financing of EE projects, and it is therefore not happening at the rate that is needed. There is a lack of commercially attractive EE financing due to traditional asset-based lending practices of financial institutions (FIs). Restrictive loan terms and high collateral requirements mean that local FIs do not receive many requests for EE financing despite funding being available, and further options need to be explored to scale the funding needed to catalyse the EE market in Philippines. There is also insufficient knowledge of the needs and benefits of EE, and limited technical capacity in businesses, government entities and FIs to either develop or assess viable EE projects, contributing to the lack of uptake in EE financing.

In the short term, the Roadmap 2023-2025 outlines financial sector capacity buildings to increase FIs understanding with EE projects and the business models. Scoping of new financial modalities, such as a revolving fund and a guarantee fund, is also key to expand the range of EE finance instruments.

5.9 Data and Monitoring, Verification and Enforcement

Given the paramount importance of data and a system of monitoring and verification, the Roadmap 2023-2050 recognises the importance of data and has prioritised this in the short and long-term time horizons. It is key to quickly establish to collect data and implement MVE frameworks on designated establishments for the development of a database, through which all other EE&C Programs and initiatives under the EE&C Act can be created and be informed by. In the long term, an EE&C knowledge management system shall be institutionalised, which is in the conduct of

IEC campaigns/materials, Program implementation, policy/regulatory improvements, ease of data accessibility, and more.

5.10 Information and Education Campaigns

The Roadmap 2023-2050 outlines IECs as an ongoing priority for DOE in the short term, which includes the development of IEC Programs, inculcation of EE&C within schools and university, and recognition awards meant to incentivise individuals and companies.

5.11 Gender and Development

The development and implementation of Programs specifically designed to target low-income households was prioritised for the Medium Term (2026-2030).

The Roadmap 2023-2050 now includes the GAD strategy development and identification of opportunities for mainstreaming GAD in EE&C as a priority in the short and medium term. The Act provides that GFIs lend at concessional rates and have compatible guarantee and insurance products available to mitigate the credit risks faced by SMEs, and the DOE recognises SMEs as a potential target group for support through various other Programs. It recognises the need to address issues of gender equality and inclusivity, including targeting low-income households through its Programs.

5.12 Waste

Waste management in relation to energy efficiency equipment (and the disposal of inefficient and obsolete products) has not historically been pursued by the DOE. It is newly included as a priority through the provision of Section 28 of the EE&C Act: Waste Management, Recycling and Disposal Guidelines.

The Act states that DENR, in coordination with the DOE and the DILG, will establish guidelines for the accurate characterization of wastes arising from energy-consuming devices, equipment, fixtures, and other relevant items, including end-of-life vehicles and their component parts. These guidelines shall include appropriate containment features and management measures for hazardous wastes.

A Waste Management Collection, Recycling and Disposal Strategy (WMCRDS) shall also be developed by the DOE, the DENR, and the DILG for wastes covered by this Act to ensure that these are managed and disposed properly to prevent impacts on the environment.

6. Monitoring and Evaluation Framework

To track the performance of the implementation of the NEECP and EE&C, an M&E framework has been developed. This framework relates to strategic actions and activities of the Roadmap 2023-2050. Each activity is tied to a

performance indicator, output, measurable targets, and assigns responsible entities and a budget for the implementation of the activity. This is illustrated in Table 10.

6.1 Government Sector (Short-Term)

Table 10: Example M&E framework for the GEMP Program under the Government sector, in the short-term time horizon (2023-2025)

Strategic Action per Roadmap	Full Strategic Action	Activities	Performance Indicator	Output	Targets	Responsibilities	Budget
GEMP: Procurement & finance review	Review procurement and finance modalities	Develop, in coordination with IAEECC, Department Circulars (DC) for financing modalities and criteria for evaluation and approval of government EE projects	Number of meetings with IAEECC to discuss development of DCs, per month	Final DCs	2	DOE, IAEECC	
		Development of standard templates and contracts in collaboration with contract specialists	Request for proposal for contract specialists	Identified experts to assist with development of standards	1	DOE, IAEECC	
			Set of standard template and contract	Standard template and contract	1	DOE, IAEECC, contract specialists	

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