ASEP CELLs
Partners in Building Energy Security

Guidebook for Local Government Units on Formulating the Local Energy Efficiency and Conservation Plan (LEECP)

BOOK 1
PROCEDURES

Funded by the European Union

ICLEI
Local Governments for Sustainability
SOUTHEAST ASIA

Guidebook for Local Government Units on the Formulation of the Local Energy Efficiency and Conservation Plan (LEECP)

Book 1: Procedures

Printed and bound in Manila, Philippines

Published by:
ICLEI-Local Governments for Sustainability Southeast Asia Secretariat
Units 3 and 6, Manila Observatory Building
Ateneo de Manila University
Barangay Loyola Heights, Quezon City
1108 Metro Manila
Philippines
Telefax: +63 2 8426 0851
Website: icleiseas.org

ICLEI – Local Governments for Sustainability is a global network working with more than 2,500 local and regional governments committed to sustainable urban development. Active in 125+ countries, we influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient, and circular development. Our members and team of experts work together through peer exchange, partnerships, and capacity building to create systemic change for urban sustainability.

Access to Sustainable Energy Programme-Clean Energy Living Laboratories (ASEP-CELLs) is a project funded by the European Union and implemented by the Ateneo School of Government in partnership with Manila Observatory, ICLEI Southeast Asia Secretariat, Xavier University, and University of San Carlos. It supports the Department of Energy through the funding of the European Union in achieving 100% rural electrification through renewable energy, increasing the share of renewable energy in the Philippines' energy mix, and promoting energy efficiency toward sustainable, inclusive growth.

Technical Team:
Charlton Materum
Anna Dominique Ortiz
Kenneth Bernard Hizon
Alfredo Bernarte, Jr.
DOE EUMB EPSMD

Table of Contents

List of Tables and Figures

List of Acronyms

A/C	Air Conditioner
ADB	Asian Development Bank
AIP	Annual Investment Program
ASEP	Access to Sustainable Energy Programme
ASEP-CELLs	Access to Sustainable Energy Programme-Clean Energy Living Laboratories
BAT	Best Available Technology
BIR	Bureau of Internal Revenue
BLGD	Bureau of Local Government Development
BOC	Bureau of Customs
BOT	Build-Operate-and-Transfer
BUILDERS	Bringing Urbanization and Innovations thru LandBank's Diverse Engineering Resources Support
CAR	Corrective Action Request
CCET	Climate Change Expenditure Tagging
CDD	Cooling Degree Day
CDP	Comprehensive Development Plan
CFL	Compact Fluorescent Lamp
CLUP	Comprehensive Land Use Plan
CO_2	Carbon Dioxide
COVID-19	Coronavirus Disease 2019
CSE	Common-Use Supplies and Equipment
DBM	Department of Budget and Management
DBP	Development Bank of the Philippines
DILG	Department of the Interior and Local Government
DOE	Department of Energy
DOF	Department of Finance
DRRM	Disaster Risk Reduction and Management
DU	Distribution Utility
E2SAVE	Energy Efficiency Savings Financing Program
EC	Electric Cooperative
EEC	Energy Efficiency and Conservation
EEC Focal Person	Energy Efficiency and Conservation Focal Person
EEC Officer	Energy Efficiency and Conservation Officer
EECO	Energy Efficiency and Conservation Office
EEF	Energy Efficiency Factor
EER	Energy Efficiency Ratio
EnB	Energy Baseline
EnMS	Energy Management System
EnPI	Energy Performance Indicator
EO	Executive Order
ESCO	Energy Service Company
ESP	Energy Service Provider
ESPC	Energy Savings Performance Contract
EU	European Union
GAA	General Appropriations Act
GB Code	Philippine Green Building Code
GEF	Global Environment Facility
GEMP	Government Energy Management Program
GHG	Greenhouse Gas
GMBD	Guaranteed Minimum Billing Demand
GOCC	Government-Owned and Controlled Corporation
GPPB	Government Procurement Policy Board
h	Hour
HDD	Heating Degree Day
hp	Horsepower
HVAC	Heating, Ventilation, and Air Conditioning

IAEECC	Inter-Agency Energy Efficiency and Conservation Committee
ICT	Information and Communications Technology
IEC	Information, Education, and Communication
IFC	International Finance Corporation
IRA	Internal Revenue Allotment
IRR	Implementing Rules and Regulations
ISO	International Organization for Standardization
JICA	Japan International Cooperation Agency
JMC	Joint Memorandum Circular
JV	Joint Venture
km	Kilometer
kW	Kilowatt
kWh	Kilowatt-Hour
L	Liter
LCCAP	Local Climate Change Action Plan
LDC	Local Development Council
LDIP	Local Development Investment Program
LDRRMP	Local Disaster Risk Reduction and Management Plan
LED	Light-Emitting Diode
LEECP	Local Energy Efficiency and Conservation Plan
LGU	Local Government Unit
LGUGC	LGU Guarantee Corporation
LPRAP	Local Poverty Reduction Action Plan
M&E	Monitoring and Evaluation
MDFO	Municipal Development Fund Office
MDFP	Municipal Development Fund Project
MECR	Monthly Electricity Consumption Report
MEPS	Minimum Energy Performance for Sectors
MFCR	Monthly Fuel Consumption Report
MTOE	Million Tonnes of Oil Equivalent
NCCAP	National Climate Change Action Plan
NEDA	National Economic and Development Authority
NEECO	National Energy Efficiency and Conservation Office
NEECP	National Energy Efficiency and Conservation Plan
NGA	National Government Agency
NGO	Non-Governmental Organization
O&M	Operations and Maintenance
OBO	Office of the Building Official
ODA	Official Development Assistance
OTLF	Omnibus Term Loan Facility
PELP	Philippine Energy Labeling Program
PESTLE	Political, Economic, Social, Technological, Legal, and Environmental
PHP	Philippine Peso
PIO	Public Information Office
PM	Preventive Maintenance
POP	Peak/Off-Peak
PPP	Public-Private Partnership
PPAs	Programs, Projects, and Activities
PV	Photovoltaic
RA	Republic Act
RE	Renewable Energy
RES	Retail Electricity Supplier
ROI	Return on Investment
RPS	Rationalized Local Planning System
SEF	Sustainable Energy Finance
SEU	Significant Energy Use
SLPBC	Synchronized Local Planning and Budgeting Calendar
SUC	State University and College
SWMP	Solid Waste Management Plan
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TWG	Technical Working Group
USAID	United States Agency for International Development
USD	United States Dollar
VFD	Variable Frequency Drive
VRV	Variable Refrigerant Volume
W	Watt
WWR	Window-to-Wall Ratio

Introduction

Objectives of the Guidebook

This Guidebook is designed to assist Local Government Units (LGUs) in developing their Local Energy Efficiency and Conservation Plan (LEECP) as mandated by the Republic Act (RA) No. 11285 or the Energy Efficiency and Conservation Act and its Implementing Rules and Regulations or IRR (DOE Department Circular No. DC2019-11-0014) which took effect in May and December of 2019, respectively. Its overarching goals are to institutionalize energy efficiency and conservation (EEC) as a national way of life, promote the efficient use of energy, and integrate EEC into the sustainable local development agenda of each LGUs in the country.

The specific objectives of Book 1 (Procedures) are to:

- Help LGUs comply with the mandatory reportorial requirements under the Government Energy Management Program (GEMP);
- Enumerate the steps and methodologies on how to formulate, implement, monitor, and evaluate a LEECP;
- Present the LEECP template from the Department of Energy (DOE);

Between 2018 and 2040, the energy demand in the country is forecast to grow at an average annual rate of 4.8%. Under a business as usual or reference scenario, the 2018 national energy demand level of 34.3 million tonnes of oil equivalent (MTOE) is projected to reach 96.7 MTOE by 2040. This will be both driven by population and economic growth; and the dominant energy-consuming sectors will be the transport, industry, and households (DOE, 2018). Thus, local plans, projects, and activities centered on EEC help secure sufficiency and stability of the energy supply in the localities, regions, and in the country to cushion the high prices of imported fuels and to protect our vulnerable environment. Furthermore, this very challenging period where government spending is strained presents key opportunities for EEC planning and project officials to rethink intelligently and to provide a strategic framework not only to realize but to achieve measurable cost savings.

Target Group

This Guidebook is created, generally, for employees of a Local Government Unit (LGU) and, specifically, its designated Energy Efficiency and Conservation Officer (EEC Officer) in order to be able to successfully formulate and implement the LEECP. Also, this Guidebook can assist external consultants in developing the LEECP and assessing EEC strategies of an LGU. While the Guidebook is intended primarily for the EEC Officers and employees of LGUs, it can still be flexibly used as reference material for energy managers and energy officers of government institutions and private organizations. Whatever is the case, the learnings and outputs should advance EEC in the country.

Structure of the Guidebook

Book 1 (Procedures) is divided into the following two (2) parts.

PART I Formulation of the LEECP
This provides a step-by-step guide to help EEC Officers in the process of developing an effective LEECP.

PART II Outline and Content of a Basic LEECP
This shows the format, elements, and allied components of a LEECP.

Conveniently unified in this Guidebook are the following materials **found in Book 2** that LGUs may refer to while formulating or updating their LEECP.

- EEC Officer and Focal Person Forms
- GEMP Reportorial Forms
- Equipment Inventory and Survey Forms
- General Energy Audit Worksheet
- Climate Change Typology Codes for EEC Projects
- Project Brief Template
- Financing Modalities and Tools

PART I. Formulation of the Local Energy Efficiency and Conservation Plan (LEECP)

According to the EEC Act, the Local Energy Efficiency and Conservation Plan (LEECP) refers to a collaborative and multi-stakeholder comprehensive framework, governance structure, and programs prepared by the LGU for local energy efficiency and conservation with defined targets, feasible strategies, and regular monitoring and evaluation. While the legal definition of a LEECP is very much straightforward in terms of its composition, it should aim to balance the three core dimensions of the energy trilemma: energy affordability and access, energy security, and environmental sustainability. Ultimately, the LGU and its citizenry are expected to be rewarded for LEECP actions that warrant favorable consideration of these dimensions. For instance, cost savings from the actions may be used to deliver affordable and just energy access to marginalized and geographically isolated areas. Likewise, a good LEECP fuels political capital and voters repay leaders who provide competitive advantage to the LGU. In formulating the LEECP, it is essential that the LGU personnel, hired consultant, or any individual assigned to draft such plan become well versed with the appropriate steps including compliance to the national government's requirements. Part I of this Guidebook helps readers understand the four main sections broken down into two to three phases in order to successfully carry out the formulation of a LEECP. In total, there are nine (9) phases with each having its own subphases.

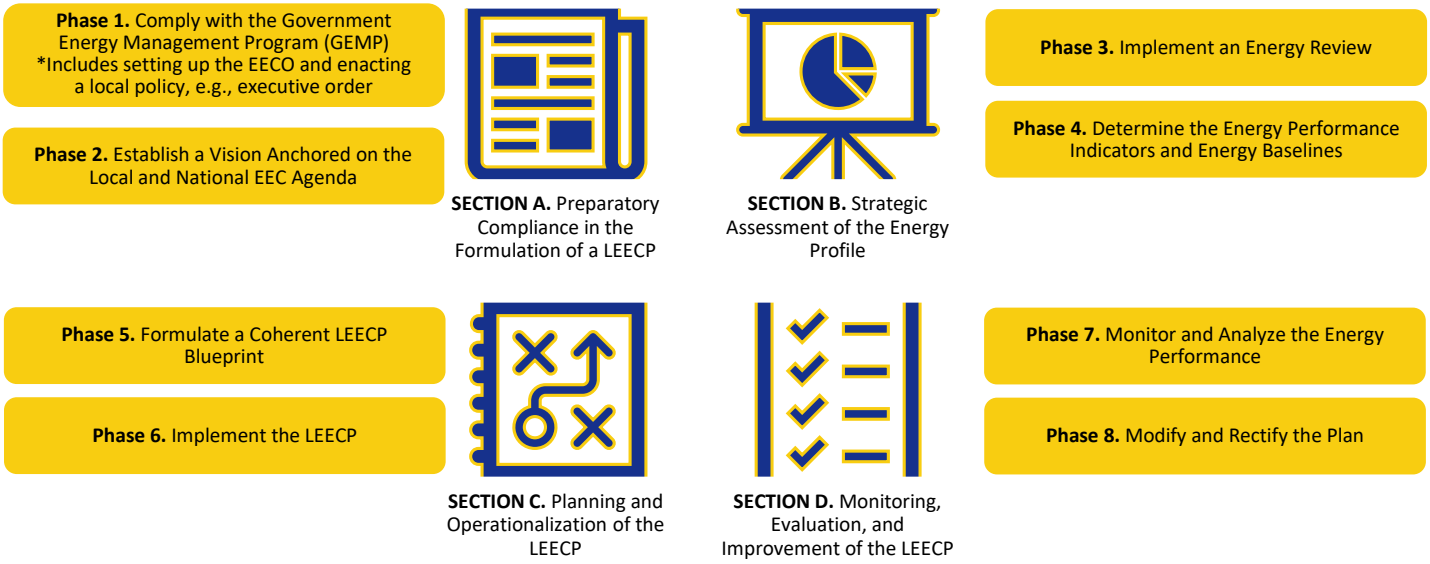

Figure 1. Summary of sections and phases in formulating a LEECP

Like the Local Disaster Risk Reduction and Management Plan (LDRRMP), Local Climate Change Action Plan (LCCAP), Solid Waste Management Plan (SWMP), and the Local Poverty Reduction Action Plan (LPRAP), the LEECP can be derived from or mainstreamed to the Comprehensive Development Plan (CDP). The CDP as well as the Comprehensive Land Use Plan (CLUP) are the two major plans that LGUs are mandated to develop according to the Local Government Code. While the CLUP is designed for the long-term and documented to regulate the spatial growth of an LGU, the CDP is designed for the medium-term and made to guide its multi-sectoral structure. Incorporating the LEECP into the CDP can sufficiently allocate proper budget for EEC projects since such mandated plans are integrated into implementation instruments such as the Local Development Investment Program (LDIP) and its annual component, the Annual Investment Program (AIP).

On top of the CLUP and the CDP that LGUs are mandated to prepare, there are still more than 30 unique plans required by different national government agencies (NGAs) for LGUs to develop, a big responsibility of the latter (DILG BLGD, 2008). There are two pre-conditions that LGUs must satisfy in order to integrate the LEECP procedurally and substantively into the avenue of local planning.

1. First, the local planning structure (as comprised of the Local Sanggunian, Local Development Council (LDC), Local Planning and Development Office, LGU department heads, etc.) must be existing and properly functioning. In this case, the LGU does not need to go to the extent of creating a new planning body in order to produce the desired plan output.
2. Second, the local plans (CLUP and CDP) must be truly comprehensible. If the LEECP covers any portion of the local territory or any aspect of local development, then such a new plan can easily be integrated into the LGU's comprehensive plans.

As of 2015, the number of CDPs formulated by the LGUs is only at 48.71% nationwide (DILG, 2017). The scenario wherein the LGU has already developed the mandated plans meets the pre-conditions stated previously. In this case, preparing and formulating the LEECP can become more ordered and seamless for the LGU. Otherwise, in the opposite scenario, the LGU may be deterred in starting the LEECP's development. While it is hoped that NGA-required plans are harmonized and not done in silos, the latter scenario must still be openly acknowledged. Recognizing these preceding facts, this Guidebook is aimed to unequivocally assist LGUs in formulating their respective LEECP whatever scenario they are in.

As guided by the CDP mainstreaming framework of the DILG, the LGU may refer to the next figure on how to mainstream EEC into the local development planning process. It aligns the following four (4) mainstreaming components under the said framework with the phases in formulating the LEECP (Phases 1 to 8). Likewise, it indicates the corresponding CDP steps (entry points).

1. Inclusion of sectoral representation in the planning structure and using prescribed analytical tools for specific themes or sectors in the local development planning processes
2. Integration of thematic and sectoral concerns into the existing planning databases
3. Translation into specific reviewable documents or sectoral plans consisting of programs, projects, and activities (PPAs) that are representative of and responsive to the needs of specific sectors or concerns

4. Inclusion and consideration of PPAs in all implementing instruments and authority levers such as the LDIP, AIP, capacity development program, legislative requirements, and monitoring and evaluation (M&E) framework and strategy to ensure their implementation

Figure 2. Mainstreaming EEC into the local development planning process

Once the LEECP has been finalized, it needs to undergo the following steps.

1. Approval from the Provincial Governor or City/Municipal Mayor
2. Submission to the National Energy Efficiency and Conservation Office (NEECO) a year before the target implementation
3. Review and evaluation under the NEECO and approval from the Inter-Agency Energy Efficiency and Conservation Committee (IAEECC)
4. Endorsement from the LDC (Provincial, City, or Municipal Development Council)
5. Endorsement, through a Resolution, from the Local Sanggunian for its adoption and implementation

Please take note that an LGUs compliance to RA 11285 is included as one of the areas of criteria of the Seal of Good Local Governance according to the IAEECC resolution 4, series 2021[a]. This could motivate LGUs in mainstreaming EEC, but it is important they understand as well the benefits of implementing EEC measures.

LEECP Guidebook sub-elements

The Guidebook breaks down the phases into subphases; and the strategic discussion elements per subphase are the following.

- **WHY IS THIS SUBPHASE ESSENTIAL?**
  This includes the definition, objectives, and practicality of the subphase.
- **HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED?**
  This covers the tasks which are needed to be performed alongside the suggested means and tools to be undertaken.
- **WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?**
  This consists of the outputs expected from carrying out the tasks of the subphase.

Section A. Preparatory Compliance in the Formulation of a LEECP

Phase 1. Comply with the Government Energy Management Program (GEMP)

Phase 1 refers to the national government's mandatory requirements for all LGUs in complying with the GEMP. All LGUs, Government Entities (GE) and Foreign Service Posts are expected to observe the approved GEMP Guidelines, as per the IAEECC

[a] "Enjoins 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 The Seal of Good Local Governance Act of 2019". Details of the resolution may be viewed at www.doe.gov.ph.

Resolution No. 5 series 2022. The LEECP needs dedicated personnel to formulate it. Also, it needs to be carefully based on the energy profile, including the historical energy consumption, of the LGU. Based on this premise, Phase 1 is comprised of five (5) subphases that also represent the mandatory reportorial requirements by the DOE.

- ☐ Establish an Energy Efficiency and Conservation Office (EECO)
- ☐ Designate an Energy Efficiency and Conservation Officer (EEC Officer)
- ☐ Designate an Energy Efficiency and Conservation Focal Person (EEC Focal Person)
- ☐ Submit Monthly Electricity Consumption Report (MECR)
- ☐ Submit Monthly Fuel Consumption Report (MFCR)

An important note on the tasks and steps introduced in each subphase: The task, prefixed by two squares (■ ■), under each subphase is the suggested approach to guarantee the execution of the overarching goal of each one. There might be more than one task under each subphase. The LGU, however, may still opt for an alternative task or a better tool to achieve the same results.

SUBPHASE 1.1

Establish an Energy Efficiency and Conservation Office (EECO)

WHY IS THIS SUBPHASE ESSENTIAL? Establishing an EECO is mandated under section 28 of the IRR of the EEC Act as well as the DILG Memorandum Circular No. 2020-082. Basically, the EECO is the office that leads EEC activities and efforts of the LGU and serves as the office of the Energy Efficiency and Conservation Officer (EEC Officer).

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? The EECO may be part of the planning and development office using appropriations from General Funds established under the Local Government Code. It can also stand separately. *Within three (3) years from the EEC-IRR effectivity, the planning and development office of an LGU shall be considered as its EECO.* In order to formally establish an EECO, the LGU can issue an Executive Order.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ An Executive Order establishing an EECO

SUBPHASE 1.2

Designate an Energy Efficiency and Conservation Officer (EEC Officer)

WHY IS THIS SUBPHASE ESSENTIAL? Designating an EEC Officer is mandated under section 29 of the IRR of the EEC Act as well as the DILG Memorandum Circular No. 2020-082. An EEC Officer is obligated to: (1) fulfill compliance with the GEMP, the EEC Act and its IRR, and all EEC issuances; (2) religiously accomplish and submit to the DOE all monthly electricity and fuel consumption reports; and (3) lead in the preparation, formulation, implementation, monitoring, and evaluation of the LGU's LEECP.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? An EEC Officer can be designated from the existing personnel of the LGU or hired through external recruitment. If the LGU is unable to hire/appoint one within three (3) years from the EEC-IRR effectivity, then the planning and development office coordinator shall be considered as the LGU's EEC Officer. At the minimum, the law requires the EEC Officer to be a college graduate. An LGU, therefore, may include additional relevant qualifications. While it is ideal that this senior official has a technical background, it is suggested that he/she demonstrates leadership, foundational, and functional competencies. At the same time, it will be highly advantageous to the LGU if the hired/appointed EEC Officer has already been trained in key energy and EEC topics. For further reading on EEC training topics, please go to Book 2, Part IV (Organizing and Capacitating the EEC Management Board).

In terms of the remuneration of the EEC Officer's services, funding requirements for this shall be charged from the existing fund of the LGU. For this reason, the availability of the *plantilla* position needs to be ensured by the human resources management and development office. In order to designate an EEC Officer, the LGU can issue an Executive Order, Administrative Order, Special Order, Memorandum Circular, or Memorandum Order, among others. The said order can also be extended to appoint a management board or a technical working group (TWG) to facilitate the LGU's EEC programs and activities. The DOE requires LGUs to formally report the appointment of an EEC Officer. The following form (Table 1) must be filled out and sent to the email address doe.epsmd@gmail.com or faxed to (02) 8840-2243. A sample partially filled out form can be found in Annex 1, Book 2 of the Guidebook.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ An Executive Order designating an EEC Officer
- ☐ An Executive Order appointing a management board or TWG (optional)
- ☐ Accomplished and submitted EEC Officer form

SUBPHASE 1.3

Designate an Energy Efficiency and Conservation Focal Person (EEC Focal Person)

WHY IS THIS SUBPHASE ESSENTIAL? The EEC Focal Person supports the EEC Officer in the implementation of the EEC PPAs. This is permitted under the IAEECC Resolution No. 01, series of 2020. The functions of the EEC Focal Person are to: (1) assist the EEC Officer in complying with the GEMP, the EEC Act and its IRR, and all other EEC issuances; (2) provide the EEC Officer with monthly electricity and fuel consumption reports, should they have separate electricity and fuel accounts from that of the mother unit/department; and (3) lead in the effective implementation of the LEECP in their respective office, building, or facility.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? An EEC Focal Person may be designated from each department, office, building, or facility by its respective heads. In order to designate an EEC Focal Person, the LGU can issue an Executive Order,

Administrative Order, Special Order, Memorandum Circular, or Memorandum Order, among others. The DOE requires LGUs to formally report the appointment of an EEC Focal Person. Table 2 must be filled out and sent to the email address doe.epsmd@gmail.com or faxed to (02) 8840-2243. This form can also be found in Annex 2, Book 2 of the Guidebook.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ An Executive Order designating an EEC Focal Person
- ☐ Accomplished and submitted EEC Focal Person form

Table 1. EEC Officer form

GOVERNMENT ENERGY MANAGEMENT PROGRAM
Energy Efficiency and Conservation (EEC) Officer
RA No. 11285: Energy Efficiency and Conservation Act

A. GENERAL INFORMATION	
Name of LGU	
Income Class	
Head of LGU	
Position	
Address	
Region	
Province	
City/Municipality	
Office Contact No.	
Office Email Address	
B. EEC OFFICER INFORMATION	
Name of EEC Officer	
Position	
Department/Division	
Mobile No.	
Landline No.	
Fax No.	
Email Address	

Please return this form via email at doe.epsmd@gmail.com
or fax to 8840-2243

Table 2. EEC Focal Person form

GOVERNMENT ENERGY MANAGEMENT PROGRAM
Energy Efficiency and Conservation (EEC) Focal Person
RA No. 11285: Energy Efficiency and Conservation Act

A. GENERAL INFORMATION (Head Office)				
Name of LGU				
Head of LGU				
Position				
Address				
Office Contact No.				
Office Email Address				
B. GENERAL INFORMATION (Facility)				
Name of Facility				
Head of Facility				
Position				
Contact Details				
Region				
Type of Facility	☐ Facility	☐ Hospital	☐ School	☐ Other
Address				
C. EEC FOCAL PERSON INFORMATION				
Name of EEC Focal Person				
Position				
Department/Division				
Mobile No.				
Landline No.				
Fax No.				
Email Address				

Please return this form via email at doe.epsmd@gmail.com or fax to 8840-2243

The *Executive Order* could cover the establishment of an EECO, designation of an EEC Officer and EE focal persons, appointment of a TWG and/or advisory group. The Executive Order must also outline the functions and responsibilities of the EECO and the other officials and personnel in the LGU.

The LGU may come up with a different organizational structure, provided that the mandated EEC Officer and EEC Focal Person/s are present. In order to strengthen the structure, it may also be necessary to assign other groups, such as a TWG to assist the management board in EEC planning. This TWG may still be headed by members of the existing management board and consist of different sectoral groups, such as, but not limited to, environmental management, power and energy, transportation, academe, and business/trade. Finally, such organizational structure must be approved by the LGU's top management.

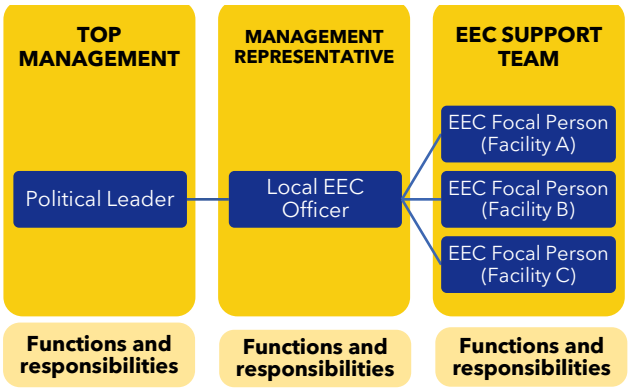

Figure 3. Three-tiered structure representing the primary EEC management board with functions and

To support the establishment of the EEC management board, the LGUs may conduct a stakeholder's analysis to identify who must be involved in the process, along with their interest, needs, and requirements. For the EEC management board to effectively fulfill their functions and responsibilities, it is advised that they participate in competence assessment and training to improve their knowledge, skills and attitude. Further reading on assessing and enhancing the competencies of the EEC management board is found in Book 2, Part IV (Organizing and Capacitating the EEC Management Board).

SUBPHASE 1.4

Submit Monthly Electricity Consumption Report

WHY IS THIS SUBPHASE ESSENTIAL? The Monthly Electricity Consumption Report (MECR)[b] shows important information such as the current electricity consumption in kWh against a reference baseline. It also reports the description of the building, coverage of gross and air-conditioned areas, and the number of occupants. Submitting the MECR to the DOE is a course of compliance with the GEMP and the EEC Act. Aside from this, the electricity consumption data allow DOE to conduct evaluation and analysis for the establishment of national energy utilization policies, proper benchmarking, calculating of electricity savings per year, sourcing of awardees for the Energy Consciousness Month every December, and other monitoring activities. It is important to stress that the MECR is essential and very useful to an LGU. Data from the MECR guide its officials, particularly the EEC Officer, in identifying areas (facilities, buildings, or departments) with significant energy consumption which can be a good take-off point in planning for EEC PPAs.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? The EEC Officer is tasked to submit the MECR forms; or together with the EEC Focal Person/s of an office, building, or facility, if it has a separate electricity account from that of the mother unit/department. Therefore, depending on this premise, an LGU is required to submit one (1) or more MECR forms. The DOE requires LGUs to submit the following MECR form (Table 3). Meanwhile, the following infographic (Figure 4) shows where to source the required data by the MECR as well as the specific documents that need to be checked. The DOE requires a monthly submission of the form. **All MECR must be submitted not later than 15 days of the month following the period to be reported.** By the end of January of the reference year, only 1 row must be filled out. Then, by the end of December of the same year, all rows must have been filled out. Previously, submissions must be sent to the email address doe.gemp@gmail.com. However, as of March 2022, the DOE launched an **online platform https://gemp.doe.gov.ph/** for future submissions of government entities. It is best to coordinate with the DOE EUMB EPSMD for guidance or participate in their information sessions on using the platform. Likewise, DOE will provide the username and password for all government entities to enable them to access the online system.

[b] MECR and MFCR forms are also found in annexes 3 and 4 of Book 2. Starting 2022, these forms must be completed at the GEMP online system https://gemp.doe.gov.ph/.

Table 3. Monthly Electricity Consumption Report form

DEPARTMENT OF ENERGY
Energy Center, Rizal Drive, Bonifacio Global City, Taguig City
Telefax: (02) 8840-2243, Email: doe.gemp@gmail.com
GOVERNMENT ENERGY MANAGEMENT PROGRAM
Monthly Electricity Consumption Report, _____

LGU _____ **Tel. No.** _____
Address _____ **Fax No.** _____
Region _____

Month	Monthly Consumption Baseline, 2015	Building Description	Gross Area, square meters	Air-conditioned area, square meters	Number of Occupants	Monthly Consumption, kWh
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
Average						

Prepared by:
_____
Designation

Noted by:
_____
Designation

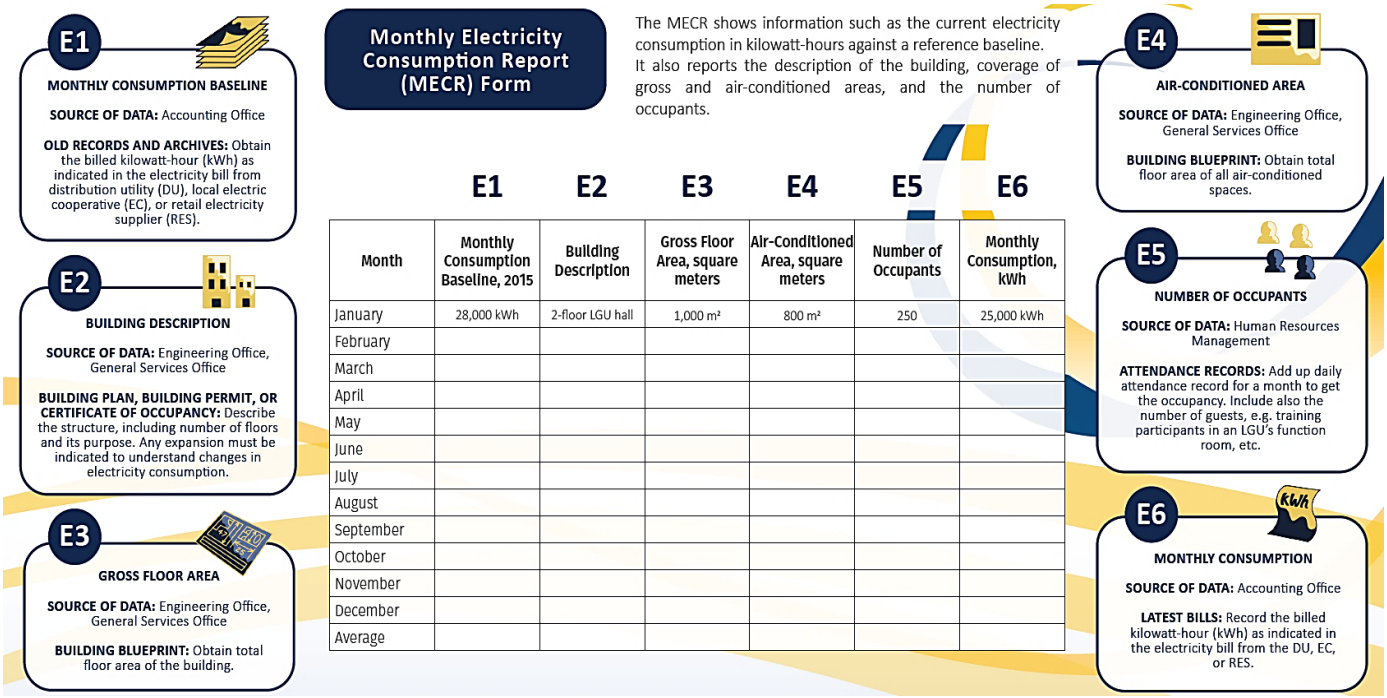

Figure 4. Infographic for the MECR form

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Filled out MECR form showing historical and current electricity consumptions
- ☐ Facilities and buildings preliminary identified to have significant energy consumption

SUBPHASE 1.5

Submit Monthly Fuel Consumption Report

WHY IS THIS SUBPHASE ESSENTIAL? The Monthly Fuel Consumption Report (MFCR) shows important information such as the current gasoline and diesel consumptions in liters (L) against a reference baseline. It also reports the total distance travelled in kilometers (km) of the LGU's service vehicles and the computed fuel economy (km/L). Submitting the MFCR to the DOE is a course of compliance with the GEMP and the EEC Act. Aside from this, the fuel consumption data allow DOE to conduct evaluation and analysis for the establishment of national energy utilization policies, proper benchmarking, calculating of fuel savings per year, sourcing of awardees for the Energy Consciousness Month every December, and other monitoring activities.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? The EEC Officer is tasked to submit the MFCR forms; or together with the EEC Focal Person/s of an office, building, or facility, if it has a separate fuel account from that of the mother unit/department.

Therefore, depending on this premise, an LGU is required to submit one (1) or more MFCR forms. The DOE requires LGUs to submit the following MFCR form (Table 4). Meanwhile, the following infographic (Figure 5) shows where to source the required data by the MFCR as well as the specific documents that need to be checked. The DOE requires a monthly submission of the form. **All MFCR must be submitted not later than 15 days of the month following the period to be reported.** Previously, the reports must be sent to the email address doe.gemp@gmail.com. However, future submissions must be made through the **GEMP online system https://gemp.doe.gov.ph/**.

Table 4. Monthly Fuel Consumption Report form

DEPARTMENT OF ENERGY
Energy Center, Rizal Drive, Bonifacio Global City, Taguig City
Telefax: (02) 8840-2243, Email: doe.gemp@gmail.com
GOVERNMENT ENERGY MANAGEMENT PROGRAM
Monthly Fuel Consumption Report, _____

LGU _____ **Tel. No.** _____
Address _____ **Fax No.** _____
Region _____

Month	Monthly Consumption Baseline						Monthly Consumption					
	GASOLINE			DIESEL			GASOLINE			DIESEL		
	Gasoline liters	Total km Travelled	km/liter	Diesel liters	Total km Travelled	km/liter	Gasoline liters	Total km Travelled	km/liter	Diesel liters	Total km Travelled	km/liter
January												
February												
March												
April												
May												
June												
July												
August												
September												
October												
November												
December												
Total												

Prepared by:
_____
Designation

Noted by:
_____
Designation

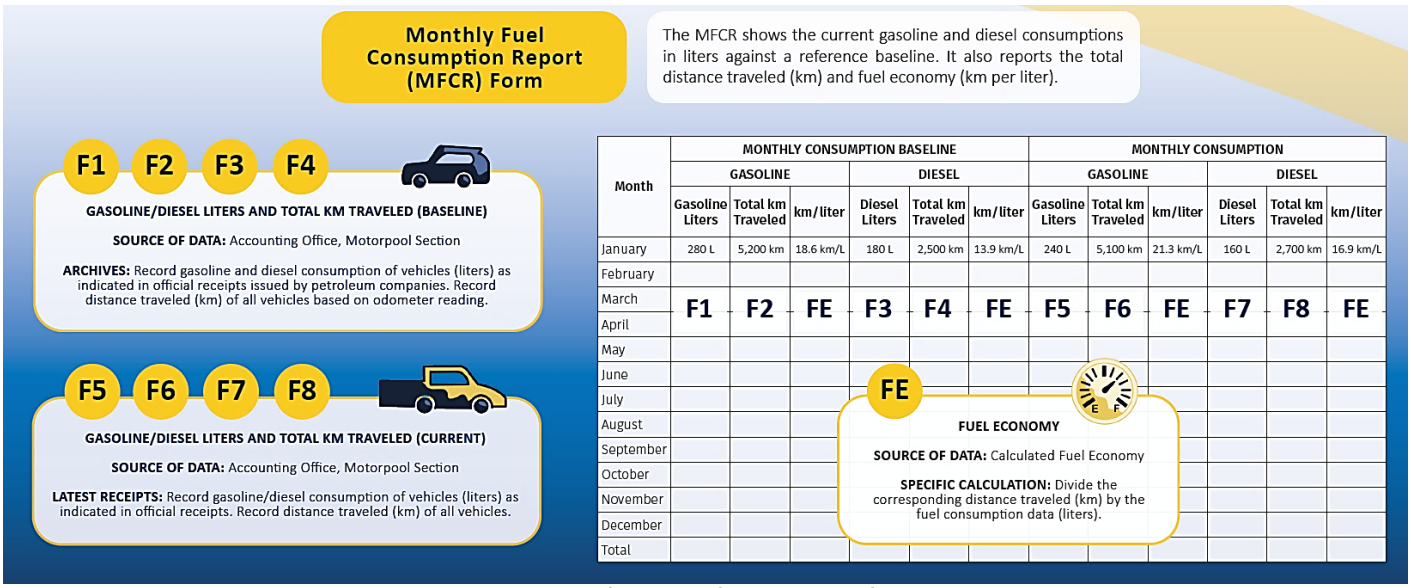

Figure 5. Infographic for the MFCR form

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Filled out MFCR form showing historical and current fuel consumptions
- ☐ Facilities, buildings, or departments preliminary identified to have significant energy consumption

Phase 2. Establish a Vision Anchored on the Local and National EEC Agenda

The Philippine Government has given longstanding emphasis to energy efficiency. Since 1975, there was already an extensive range of statements of strategic intent on energy efficiency. Two long term statements clearly documented in the NEECP are the objective and policy statements. NEECP's objective statement is to make energy efficiency and conservation a way of life, while its policy statement is the judicious conservation and efficient utilization of energy resources through the adoption of cost-effective options toward the efficient use of energy to minimize environmental impact. These living declarations remain highly relevant and serve as a concrete platform in the drafting of major plans (EU SWITCH Asia Programme, 2017). This phase contains the following subphases.

- ☐ Document the Legal Requirements, Organization, and Context
- ☐ Develop an Energy Policy

SUBPHASE 2.1

Document the Legal Requirements, Organization, and Context

WHY IS THIS SUBPHASE ESSENTIAL? As with any other transaction, project, plan, or activity, there will always be the association of legal responsibilities. If the LGU has completed Phase 1 (Prepare the GEMP Reportorial Requirements) and its subphases (Designate an EEC Officer et al.), then it has already started its conformance with legal requirements. Such legal requirements can be considered as influencing factors to the LGU's ability to achieve the planned results of a LEECP and the overall energy management system, including energy performance and energy consumption. However, these legal requirements are not the only influencing factors. There are other internal and external conditions that the LGU must determine. An essential reference on key issuances relating to EEC is found in Book 2, Part I, Section B.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED?

■ ■ **TASK 1. Document existing legal requirements:** Before documenting the applicable and existing legal requirements, it is paramount that the LGU must detail its current procedure on how it gets to know about the new and updated legal norms and who (individuals and/or departments) becomes assigned with the attached responsibilities.

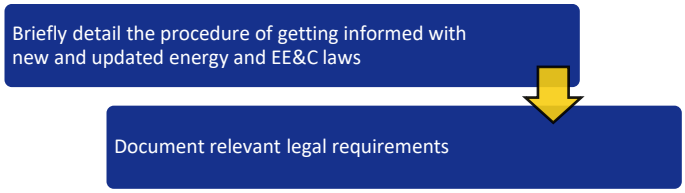

Figure 6. Procedure in documenting existing legal requirements

Relevant legal requirements would include all legal acts about the use of energy, efficiency levels, energy labeling standards, energy audits, public buildings, use of electric equipment, etc. Building upon the key government policies and issuances on EEC, the LGU should create a database or a registry of all these relevant statutes and codes. The LGU is also advised to conduct a stakeholders' analysis as explained in Book 2, Part IV (Organizing and Capacitating the EEC Management Board – Stakeholder's analysis).

The identified needs and expectations of each stakeholder can be checked if it relates to a particular legal requirement (see Table 5). For instance, the public hospital has a future need of additional power requirement within two years for the construction of an annex. This need relates to energy and EEC regulations such as the Philippine Energy Labeling Program (PELP), Philippine Green Building Code, etc. It is possible that not all legal requirements are determined using Table 5Table 5. Hence, other legal requirements should still be documented. Also, new laws are introduced from time to time; and previous decrees and orders inconsistent with the newer laws are repealed accordingly. Thus, the LGU must be proactive in being informed with these updates.

Table 5. Stakeholder analysis with legal requirements

Parties and Stakeholders	Needs, Requirements, Interests, and Expectations Related to Energy Consumption and Energy Performance	Legal Requirements
(e.g., name of public hospital)	Requirement: uninterrupted, reliable power supply 24/7 Future need: additional power requirement within two years for the construction of the hospital's annex	EEC Act of 2019, Philippine Energy Labeling Program, Philippine Green Building Code
…		

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ An LGU-approved organizational structure showing the EEC management team and functions/responsibilities
- ☐ List of participating and essential stakeholders which shall be involved in the LEECP and EnMS planning and implementation process, organized based on the stakeholder analysis and power/interest matrix
- ☐ Consulted stakeholders with their needs/issues/requirements relating to the LGU's energy consumption and performance

■ ■ **TASK 2. Carry out a context analysis in determining internal and external conditions and their impacts and assessing the risks and opportunities involved:** The LGU can monitor and review information on internal and external conditions through various tools and techniques. The common methods are SWOT (strengths, weaknesses, opportunities, and threats) and PESTLE (political, economic, social, technological, legal, and environmental) analyses.

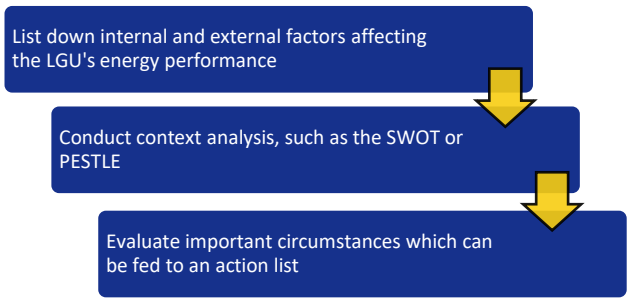

Figure 7. Context analysis of internal and external conditions affecting energy performance

After completing the SWOT analysis, the next approach is to convert it into real strategy. Such a strategy will appropriately assess the risks and opportunities involved. One must look at the strengths and figure out how they can be used to take advantage of opportunities. Then, one must continue to analyze how external opportunities can combat internal weaknesses. Minimizing weaknesses can also help avoid the threats identified (Parsons, 2021). For example, an evaluation of the SWOT may lead to the following action list. This will prove to be useful when selecting and prioritizing EEC PPAs.

1. **Internal strength taking advantage of an external opportunity:** A human resource (EEC Officer) has been well trained in EEC. He can make use of his knowledge to influence the procurement of new technologies (inverter A/C, LED light, etc.)
2. **External opportunity combating an internal weakness:** A national order (GEMP) is directing all government agencies and LGUs to turn off lights during lunch breaks and after office hours. This does not only result to electricity savings but also prevents an employee's bad behavior of not switching off lights or not paying attention to the conservation of electricity.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Brief description of the LGU's procedure in getting informed with new and updated laws
- ☐ Documented legal requirements
- ☐ A list of internal and external factors affecting the LGU's energy and EEC performance
- ☐ A context analysis of such internal and external factors, such as a SWOT or PESTLE analysis
- ☐ An action list based on the SWOT or PESTLE analysis

SUBPHASE 2.2

Develop an Energy Policy

WHY IS THIS SUBPHASE ESSENTIAL? Appropriate interventions in the LGU's consumption of energy could not materialize if there is no internal governance in energy usage in its offices and facilities. The Energy Policy is an intrinsic document in which the LGU authoritatively and publicly declares its commitment to continuous improvement and in reducing its own energy consumption through different means such as the upholding of EEC and the use of RE while also minimizing environmental impacts. The top management should define the Energy Policy and ensure that it is in harmony national energy policies. Leading by example is perhaps one of the most profound statement an LGU can make about the importance of energy efficiency. The investment of the LGU in energy efficient alternatives embodies the fiscal and managerial responsibility that many citizens demand (Francis & Feiock, 2011). Thus, the crafting of an Energy Policy sends the clear message that the LGU wants to lead by example. In developing an Energy Policy, the LGU must ensure a balanced scorecard relating to the objectives and goals of energy management. Then, this must be aligned and cascaded to the overall scorecard of the LGU. This way, both the leaders and personnel will become fully committed and supportive of energy programs all throughout.

Figure 8. The tagline and emphasis of the NEECP

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED?

■ ■ **TASK. Develop an actionable Energy Policy:** The LGU needs to enact and adopt the LGU Energy Code as its Energy Policy based on the DILG-DOE Joint Memorandum Circular (JMC) No. 2020-01 on guidelines for LGUs to facilitate the implementation of energy projects. Detail of the JMC is likewise found in Book 2, Part I, Section B. It is strongly prescribed that such an LGU Energy Code also includes, but not limited to, the following pledges of the LGU. Such an Energy Policy should be officially declared and approved by the highest governing body of the LGU. It is also effective to have the Energy Policy be conspicuously posted as a reminder to all LGU staff.

- ☐ Continuous improvement in its energy performance, including the advancement of EEC and RE
- ☐ Conformity with all applicable and relevant legislative requirements
- ☐ Mobilization of information and resources to achieve objectives and targets
- ☐ Provision of a framework for setting the objectives and targets
- ☐ Support for the purchase of energy-efficient products and services
- ☐ Rewarding and/or acknowledgement of employees actively participating in the LGU's EEC efforts
- ☐ Proper documentation and communication of actions so that all LGU officials and staffs are obligated to function according to the objectives of the policy

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ A publicly declared Energy Policy of the LGU
- ☐ LGU officials and employees start to commit to the goals of the Energy Policy

Section B. Strategic Assessment of the Energy Profile

Phase 3. Implement an Energy Review

Energy review refers to the documented analysis of energy efficiency, energy use, and energy consumption based on data and additional information. Put simply, the LGU must describe how, how much, where, and why the energy in its assets and facilities is used, leading to the recognition and identification of areas of significant energy uses (SEUs) and opportunities for the improvement of energy performance. The methodology and criteria by which an energy review is conducted by the LGU is also part of this documentation (Fletcher, 2018). An energy review is usually performed annually, while its frequency of revision is freely chosen by the LGU. One of the major aims of this Guidebook is to aid LGUs in independently executing the tasks. Nonetheless, they are not inhibited to hire professionals, consultants, and energy experts to perform the same. In most cases, the conduct of a third-party, such as engaging a certified Energy Service Company, in energy audit will be beneficial and complementary to this phase, Phase 3, and section, Section B, in general. The following are the subphases of Phase 3.

- ☐ Collect and Analyze Energy Data
- ☐ Determine Significant Energy Uses
- ☐ Identify and Prioritize Energy Improvement Opportunities

SUBPHASE 3.1

Collect and Analyze Energy Data

WHY IS THIS SUBPHASE ESSENTIAL? The national government, through DOE, already obligates LGUs to report electricity and fuel consumptions on a monthly basis. Please see Subphases 4 (p. 9) and 5 (p. 10) under Phase 1 in order to accomplish this. The collection and regular reporting of the monthly energy consumption are the foundation of further analysis and identification of areas of SEUs.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? There are several tasks to be carried out under this subphase of collection and analysis of energy data. Among these are the identification of energy sources and energy uses, having in place a plan for data collection, collection of related energy and relevant variable data, ensuring the accuracy and repeatability of measurements, and the analysis of energy use and consumption data (U.S. DOE & Lawrence Berkeley National Laboratory, 2021).

■ ■ **TASK 1. Develop a consistent and reliable data collection plan based on needed data:** There are several aspects that must be carefully considered in developing a consistent and reliable data collection plan. The energy data collection plan is developed to define, systematize, and document all monitoring and measurement steps and activities. It is highly recommended that the data collection plan will identify, define, and describe the following pivotal highlights.

1. **Energy data sources.** It is important to quickly locate and obtain energy data. An electricity bill, such as the one issued by a DU, local EC, or RES, is readily available and the needed information is easy to collect from it. Energy data can also be sourced, with some extra effort, from: submeters or portable meters, nameplate data of equipment or appliance, purchase orders, etc. In addition, sources of relevant variables must also be properly considered.
2. **Energy data repository.** In order to be organized and ensure accessibility, all energy data should be entered into a central location. This should also include all accomplished and submitted MECR and MFCR forms.
3. **Collection and storage responsibility.** A personnel or team must be assigned to collect and store all energy data. The EEC Officer should be the one leading such efforts.
4. **Frequency of data collection.** A monthly collection of data is already sufficient. However, it is up to the LGU how frequent any other data must be collected.
5. **Periodic review of measurement needs.** The energy data collection plan must be regularly reviewed over time for any change in measurement needs and records. For this reason, a minimum frequency (quarterly, semi-annually, annually, etc.) of the review must be defined.
6. **Accuracy and repeatability of measurements.** If in case the LGU relies heavily on measuring and monitoring equipment and instruments for its energy data, then it must be ensured that a calibration program is provided for such equipment and instruments (i.e., identification of instruments to be calibrated, method of calibration, estimation of calibration tolerance and frequency, assignment of responsibilities, and appropriate documentation).
7. **Other pertinent information**.

■ ■ **TASK 2. Determine appropriate analysis methods to understand and monitor energy use and energy consumption:** Collected energy data and other allied information can be analyzed in a variety of ways, from straightforward and uncomplicated in-house spreadsheets to advanced software. In the end, one of the most important outcomes of the energy data analysis is to find the systems, equipment, facility, building, or site with the largest energy consumption. The said data analysis methods and techniques, appropriate to an LGU, depend on several factors. In choosing the method/s, the following must be carefully asked.

1. What are the available energy data?
2. What is the desired output of the analysis?
3. What is the level of available competency for data analysis?
4. Who will be the audience?

Examples of common methods include:

- ☐ Regression analysis
- ☐ Trend analysis
- ☐ Ranking
- ☐ Benchmarking
- ☐ Graphs
- ☐ Energy balance
- ☐ Pareto analysis
- ☐ Financial analysis

■ ■ **TASK 3. Identify current energy sources:** Identify and document the LGU's current energy sources. This will basically refer to any of the following energy consumed by the LGU.

☐ Electricity	☐ Propane	☐ Geothermal/steam
☐ Diesel	☐ Coal	☐ Biomass
☐ Gasoline	☐ Wind-based electricity	☐ Compressed air
☐ Natural gas	☐ Solar-based electricity	☐ Chilled water

The first three items from the above list (electricity, diesel, and gasoline) are the ones mostly consumed by the LGUs. This is the reason why the MECR and MFCR forms presented and discussed in Subphases 1.4 and 1.5 specify them as the energy sources. Even then, all other energy sources consumed must still be identified. The assistance of the Engineering Office of the LGU can be sought, together with the following documents, to properly identify the energy sources: floor plans; building schematic and wiring diagrams; site plan with locations of equipment; process flow chart; and list of equipment. Using the approach in Phase 1, take into consideration the independent energy source/s of any building, facility, or department having different account/s from the mother unit. The designated EEC Focal Person/s can help the EEC Officer in identifying the sources of energy within his/her site/vicinity.

■ ■ **TASK 4. Identify energy uses:** Energy use, defined as the application of energy, must also be identified. Energy uses are associated with facilities, sites, equipment, systems, and processes that consume energy. It may include the following.

☐ Air conditioning	☐ Indoor lighting	☐ Refrigeration systems
☐ Cooling towers	☐ Outdoor lighting	☐ Pumps
☐ Water chillers	☐ Water heating	☐ Motors
☐ Fans and ventilation	☐ Boilers	☐ Compressors
☐ Printing	☐ Cooking	☐ Transportation

Such energy uses must be categorized in a way that suits the LGU. The identified energy uses can be organized by: site/facility (hospital, public park, executive building, etc.); equipment (all A/C units, all fans, etc.); departments (accounting office, engineering office, etc.); processes (all equipment associated with the processing of building permits, printing, etc.); and utility distribution (panel A, panel B, or all 30-ampere circuit breaker); among others. Since the previous task and the tasks under Phase 1 consider the categorization based on site/facility, it is recommended that the LGU continue with such course.

■ **TASK 5. Identify relevant variables affecting energy consumption:** The relevant variables refer to the influencing elements that are considered to have a major impact on the LGU's energy performance. Such variables routinely change and can be quantified. Relevant variables may include, among others, any of the following.

- ☐ Occupancy
- ☐ Weather
- ☐ Office hours and operating schedule
- ☐ Changes in activities and priorities

In order to attest for the impact of the relevant variable, both the energy and variable data must be collected and compared. If the energy consumption changes (increases or decreases) coincidentally with the same variable data, then the latter can be referred to as a relevant variable. The next two figures demonstrate examples of this in an office setting. The first graph shows how occupancy levels affect the building's electricity consumption in direct proportion. The next graph shows how the local weather, in terms of cooling degree days (CDD) or heating degree days (HDD), directly impacts the same electricity consumption. The CDD is a very helpful metric used to measure how much and how long the outdoor air temperature is higher relative to a base temperature, say the indoor reference temperature. Meanwhile, the HDD is the opposite of CDD (Eurostat, 2020). Thus, to put it simply, a higher CDD indicates that a hotter surrounding weather contributes to a higher energy consumption of the building. In the Philippines, the CDD is mainly used because of the relatively warm surrounding weather. The dry season usually begins around November until May, and the hottest months are from March to May. It is expected, therefore, that air conditioning will drive up the office's energy consumption and be a significant energy user during these months. The graph in Figure 9 compares the levels of electricity consumption and occupancy. It is noticeable that in the month of February, the drop in occupancy (4,105) concurs with a drop in the electricity consumption (163,100 kWh). Also, in the month of October, the rise in occupancy (4,670) concurs with a rise in the electricity consumption (213,600 kWh). Therefore, the occupancy is considered as a relevant variable affecting the office's energy consumption.

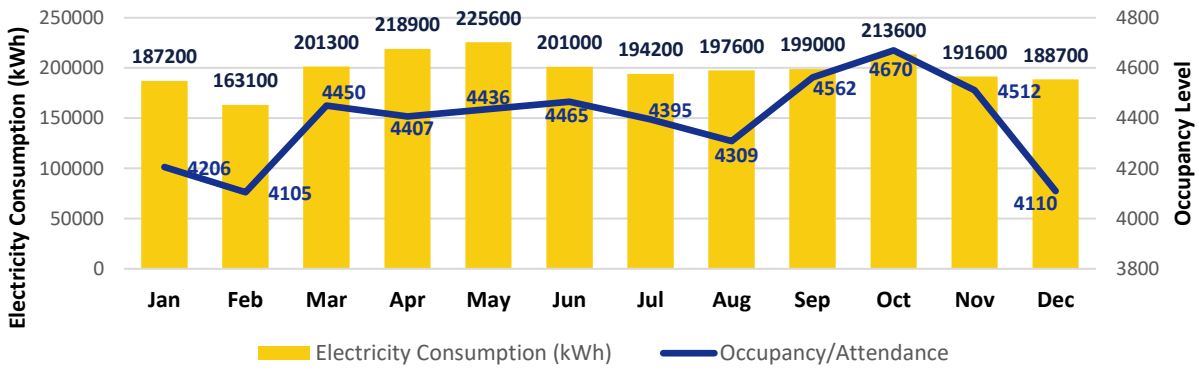

Figure 9. Sample electricity consumption versus the occupancy/attendance level in an office setting

The graph in Figure 10 compares the electricity consumption versus CDD data. It can be noted that the two highest CDDs are in April and May. Coincidentally, these two months also represent the highest electricity consumptions of the same year. Thus, the hot outside weather during these months can be considered a contributing factor in increasing the electricity consumption. Therefore, the weather is considered a relevant variable affecting the office's energy consumption.

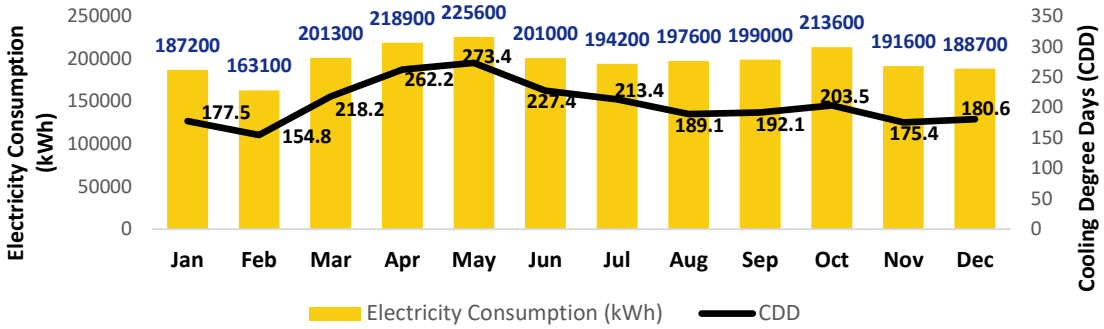

Figure 10. Sample electricity consumption versus the CDD (weather factor) in an office setting

The MECR form (Table 3) presented in Phase 1 is a good starting point for identifying the relevant variables. It already includes a column for the number of occupancies of the facility, building, or department. Both the electricity consumption and the occupancy can be graphed and analyzed to see the concurrences. Based on the analysis and using the previous figures and explanations as guides, the variable can be decided if it is relevant or not. The LGU should continue to check all potential, relevant data. Monthly historical data for the CDD, serving as a factor for the weather, is location dependent and can be obtained from different references such as weather stations or online sources, including www.degreedays.net (BizEE Software, 2021). Using the same course of categorization of the previous tasks, this must be done per facility, site, building, or department.

Table 6. Historical data of relevant variables

Facility/Site Name							
Relevant Variable 1				**Unit**			
Month	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
January							
February							
March							
…							
December							
Relevant Variable 2				**Unit**			
Month	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
January							
February							
March							
…							
December							

■ ■ **TASK 6. Determine the persons affecting the energy uses:** Central to the identified energy uses are the persons who directly affect or contribute to their energy performance. This can refer to the employees, facility managers, site engineers, service providers, or onsite contractors whose work activities affect the energy uses. Once these people are identified, it will be vital to engage with them so that they are aware of the focus on the energy use. Likewise, these personnel may need additional awareness training or qualifications to ensure that future operational procedures and EEC measures will be followed accurately. Suggested topics for EEC training are outlined in Book 2, Part IV.

■ ■ **TASK 7. Collect data:** Both the MECR and MFCR forms accomplished by the LGU already manifest energy data collection in action. Analogous to this, the DOE also provides LGUs with inventory and survey worksheets for the latter to itemize its equipment and appliances (lighting, A/C, generator, office equipment, vehicle, etc.). Such an inventory is of utmost importance to be fully aware of all equipment, appliances, machines, devices, etc. together with their corresponding rated power and other detailed information. Likewise, this helps in the monitoring of all the available assets during the DOE's conduct of an energy audit in government-owned buildings. The following lists the available inventory and survey worksheets from the DOE which are annexed in Book 2 of the Guidebook.

- ☐ Survey of Government Air-Conditioning Units and Generators (Annex 5)
- ☐ Survey of Centralized Air-Conditioning Units (Annex 6)
- ☐ Survey on Lighting System (Annex 7) and on Office and Other Equipment (Annex 8)
- ☐ Vehicle inventory list (Annex 9)

Additional data collection worksheet found in Book 2, Table 7 (sample filled out data collection worksheet) could be used to keep track of the energy sources, energy uses, equipment inventory and specifications, energy consumption, and relevant variables among other essential information.

■ ■ **TASK 8. Identify additional data needs:** An energy review requires data and information to sufficiently profile the energy situation of the LGU. Aside from the outputs and results of the previous tasks, it should include the following data and information.

- ☐ Analysis of past and current energy uses and energy consumption
- ☐ Significant energy uses (SEUs), including energy performance and relevant variables
- ☐ Estimates of future energy use and energy consumption
- ☐ Prioritized opportunities for improving energy performance

For the analysis of past and current energy uses and energy consumption, one can look at the reported and submitted MECR and MFCR forms. In order to understand the trend, a breadth of data should be available. For instance, a five-year electricity or fuel consumption data can be documented and investigated.

Table 7. Historical electricity consumption based on MECR

Facility/Site Name	Facility A						
Energy Source	Electricity			Unit	kWh		
Energy Use/s							
Month	2015	2016	2017	2018	2019	2020	2021
January							
February							
March							
…							
December							

One simple analysis in Table 7 is to check for changes (increases or decreases) in the data. For instance, to check if January 2016 increased or decreased in energy consumption as compared with the previous year, the following equations can be used. A positive result for the computed "Change in kWh of January 2016" indicates that there has been a reduction in energy consumption on January 2016 as compared with the average of 2015 values. Other methods may be employed to properly evaluate the energy data.

$$Average\ Monthly\ kWh\ Baseline\ of\ 2015 = \frac{\sum(January\ 2015\ to\ December\ 2015)}{12}$$

$$Change\ in\ kWh\ of\ January\ 2016 = Average\ Monthly\ kWh\ Baseline\ of\ 2015 - January\ 2016\ kWh$$

SEUs are significant and critical as they are identified to account for, among many other factors, the largest chunk in energy consumption; and so, any potential energy efficiency or energy conservation project should be targeting these. The identification of SEUs will be further explored in Subphase 3.2 (Determine Significant Energy Uses).

The estimation of future energy uses and energy consumption is an important step in energy planning. Projections allow for the LGU to look at the circumstances and factors that could affect consumption and make important decisions about energy projects, technology implementation, etc. An illustration forecasting future energy consumption and energy estimate worksheets are further discussed in Book 2, Part V on Strategies in Doing an Energy Review (Forecasting Future Energy Uses).

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ An energy data collection plan
- ☐ Determined appropriate energy data analysis method/s
- ☐ Identified current energy sources, organized based on the facility, building, or department
- ☐ Identified energy uses
- ☐ Identified relevant variables affecting energy consumption
- ☐ Collected and organized energy data
- ☐ Identified further data needs necessary for an energy review, such as the analyzed past and present energy uses and energy consumption and estimated future energy uses and energy consumption

SUBPHASE 3.2

Determine Significant Energy Uses

WHY IS THIS SUBPHASE ESSENTIAL? Energy uses (processes, systems, equipment, etc.) with sizable and substantial energy consumptions or have a considerable potential for the improvement of energy performance are labeled as significant energy uses (SEUs). The process of identifying SEUs is part of the energy review; and the very purpose of this subphase is to establish where most of the LGU's energy is being consumed. While not all SEUs may be the largest consumers, it may also include those which have high potential for saving energy. Once these SEUs have been identified, it is strongly recommended that the LGU focuses most of its efforts in improving their corresponding energy performance (United Nations Industrial Development Organization, 2021).

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED?

■ ■ **TASK 1. Select SEUs through the establishment of criteria:** For any LEECP or any newly implemented energy management system, it is very important to start simply. The LGU may consider restricting the number of SEUs at first since these energy uses require the most resources. The LGU will have to come up with its own criteria of selecting which energy uses are significant and which ones are not. As discussed in the previous subphase, an energy balance can be employed as a method of analyzing energy data. Once a balance is carried out, each of the identified energy uses can be ranked based on their energy consumption. Such a scheme is one of the most common methods for determining SEUs. The Pareto Principle or the so-called 80/20 Rule can also play a role in determining SEUs. Applying it in the field of energy, it means that 80% of the energy consumption (consequences) comes from 20% of the processes or equipment (causes). As a general indication, this principle tells that the relationship between inputs and outputs is not balanced.

Methods on prioritizing SEUs are explained in Book 2, Part V on Strategies in Doing an Energy Review (Methods to Determine Significant Energy Uses).

■ ■ **TASK 2. Identify the relevant variables and determine the current energy performance of SEUs:** After the process of selecting the SEUs, one can go ahead and identify the relevant variables affecting the energy performance. Please be guided with the procedures outlined under Subphase 3.1, Task 5 (Identify relevant variables affecting energy consumption).

■ ■ **TASK 3. Determine the persons affecting the SEUs:** All personnel affecting the SEUs should also be determined. Please be guided with the procedures outlined under Subphase 3.1, Task 6 (Determine the persons affecting the energy uses).

■ ■ **TASK 4. Form a plan for updating the selection of SEUs:** The final task is to plan for when and how the criteria and procedure of choosing SEUs will be reevaluated and updated. As time progresses and as the LGU continues to improve its energy performance, the energy uses labeled as SEUs may not be as significant as before. Thus, the SEU selection methodology might have to be appropriately modified. It is highly recommended that the documented plan for updating the selection of SEUs will identify, define, and describe the following pivotal highlights.

1. **Collection and storage responsibility.** A personnel or team must be assigned to collect and store all SEU-related data. The EEC Officer should be the one leading such efforts.
2. **Selection process of SEUs.** The method of selecting and prioritizing SEUs among others must be well defined. It can be through a Pareto analysis, ranking system, or any other evaluation method that the LGU is well versed with.
3. **System of monitoring performance of the SEUs.** The plan should define the frequency (semi-annually, annually, etc.) of monitoring the quantitative performance of the SEUs. It should also specify which exact data or values, such as energy performance indicators or EnPIs, must be monitored. A discussion of EnPIs can be found on Phase 4. Determine the Energy Performance Indicators and Energy Baselines).
4. **System for continuous review of relevant variables and responsible personnel.** The plan must also make room for the continuous review of relevant variables as well as the people affecting the SEUs for any change. A minimum frequency of the review should also be defined.
5. **Periodic review of criteria.** EEC improvement projects, new internal procedures, changes in sites and energy-using processes, and the availability of resources may all affect the performance of an SEU. Therefore, the selection criteria need to be frequently reviewed (semi-annually, annually, biannually, etc.) and modified accordingly.
6. **Other pertinent information**.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Applied selection criteria to determine the SEUs
- ☐ Identified the relevant variables affecting the energy consumption of SEUs
- ☐ Identified all persons affecting the performance of SEUs
- ☐ A documented, defined plan for updating the selection of SEUs

SUBPHASE 3.3

Identify and Prioritize Energy Improvement Opportunities

WHY IS THIS SUBPHASE ESSENTIAL? Serving as a key segment of energy review are the opportunities for the improvement of energy performance. The avenue to bring forward such opportunities emanates at the stage where current energy consumption practices are examined and potential improvements are determined. All these improvement opportunities harmoniously reduce energy consumption, decrease operating and energy costs, improve operating efficiency, and give a positive effect to the environment.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED?

■ ■ **TASK 1. Identify opportunities for the improvement of energy performance**

Energy audit: The most convenient and common technique to identify potential energy performance improvement opportunities is through an energy audit. An energy audit is considered the key to a systematic approach in the field of energy management as it translates conservation ideas and hopes into reality, lending technically feasible solutions with economic and other organizational considerations within a time frame. Put simply, energy audits yield a snapshot of the LGU's current energy performance and propose a list of quantified improvement measures. Proposals and recommendations may range from improved energy data management to a plethora of appropriate energy-saving technologies, structural improvements, system retrofits, and end-user behavior changes (Wimmer, Guivencan, & Materum, 2015). The major activities of an energy audit include the following:

- ☐ Gathering of data
- ☐ Analysis of data
- ☐ Presentation of options for improving EEC
- ☐ Reporting on major findings and recommendations

The DOE and its team conduct scheduled energy audits for LGUs. DOE's energy audit is administered in three (3) stages: (1) pre-audit coordination which covers the communication of documentary requirements for submission, orientation on energy audit, and determination of method (virtual or spot checking); (2) actual audit which consists of a meeting with the EEC Officer, validation of submitted documents, walkthrough inspection, and an exit meeting for findings and recommendations; and (3) post-audit which includes the submission of an energy audit report. It is highly recommended that the LGU directly contacts the DOE to avail of such an incentive. Aside from the DOE, audits and assessments can be conducted by energy service companies (ESCOs), energy specialists, continual improvement teams, external technical consultants, university experts, etc. However, an LGU may only commission a third-party energy audit through a DOE-certified and registered ESCO; the resulting audit report from such an activity will also be reviewed by the DOE. After the successful conduct of an energy audit, an LGU may receive the following sample recommendations (Table 19). This includes the details of the recommendation, the amount of potential energy savings, the payback period, or the return on investment (ROI), and added benefits among others. This has been summarized to allow better understanding of the reader.

Energy audit is a wide topic and even the opportunities for the enhancement and improvement it presents are expansive. In fact, being an energy auditor is a very technical skill and competency. While it is not the goal of this Guidebook to discuss the details of an energy audit and present all possible potential improvements in LGU-owned buildings and assets, it will certainly be an added advantage to the LGU, particularly the EEC Officer and his/her team, to become knowledgeable of some particulars being asked and scrutinized during the conduct of one. In order to know more about this, a general energy audit worksheet guide is found in

Annex 10, Book 2 of the Guidebook. This also serves as a tool to learn more about potential energy performance improvement opportunities.

Table 8. Snippet of sample recommendations in an energy audit report

Sample Recommendations	Estimated Savings (kWh/month)	Payback Period	Additional Benefits
1. Lighting			
a. Replace the 100 units of 60 W incandescent lamps with 8 W LED lights[c]	1,248	2 months	Reduction of heat load
b. Maximize the use of natural daylight in the hallways during effective sunshine hours from 9 AM to 3 PM to offset the use of artificial lights totaling 300 W	54	0	Natural light helps improve employee productivity
c. …			
2. Air Conditioning			
a. Replace the 10 units of 2 hp non-inverter window-type A/C units with an inverter type[d]	1,836	2 years and 3 months	
b. Seal gaps around the windows of the 2/F meeting room which houses 2 units of 1.5 hp non-inverter split-type A/C[e]	60	5 months	
c. …			
3. Pumps, Motors, and Compressors			
…			

Other approaches in defining energy performance improvement opportunities: While energy audits are indeed very effective, they can also be costly especially when done by third-parties. Identifying improvement opportunities is not an exclusive task in the context of an energy audit since there are other approaches which can define such opportunities. The next table shows these other approaches that an LGU may employ. It includes a checklist feature to record the approaches or methods used.

Table 9. Other approaches in defining improvement opportunities

Approach	Expected Outcomes	Was this approach already used? (Yes/No)	When was this used? (Date)	When will this approach be used? (Date)
Suggestions and recommendations from employees	Through the suggestion system or survey forms, there will be improvements in energy efficiency and operating efficiency and reductions in energy waste			
Suggestions from the contracted service technicians of energy equipment	Operating and maintenance recommendations from the service provider			
Technical support instructions from equipment vendors and manufacturers	Instructions on the most efficient operating conditions and maintenance practices to maximize and sustain operating efficiency			
Revisiting PPAs in the CDP, CLUP, NGA-required plans, etc.	Improvement opportunities derived from plans which are already responding to the goals of EEC			
Advices of utility (DU, LC, RES) account representative	Information on available utility rates, special incentivization programs such as the Peak/Off-Peak (POP) program, appropriate changes in the Guaranteed Minimum Billing Demand (GMBD), new technologies promoted, and energy source switching opportunities			
National equipment and labeling standards	Recommendations on high efficiency standards and equipment			
Benchmarking	Spreadsheet tools for use to benchmark a building's energy intensity to national, regional, and international best practices and to identify implementable energy efficiency options			
Employment of lean processes, such as Six Sigma, Value Stream Mapping, and Energy Kaizen Events	Lean training courses, seminars, and website in Six Sigma, Value Stream Mapping, and Energy Kaizen Events help identify approaches and process changes to reduce energy waste and improve operating efficiency			

Low hanging fruits in EEC: The government may not always have the resources to implement projects requiring capital expenditure. As such, identifying low hanging fruits or quick wins (such as the following) is important before embarking on more costly projects.

- ☐ Review of the energy (electricity, fuel, etc.) contract provisions and its cost drivers
- ☐ Proper maintenance and optimal operation of equipment like HVAC, motors, lighting, appliances, and vehicle fleet
- ☐ Review/evaluation of materials/equipment purchase specifications for energy efficiency consideration in the cost evaluation
- ☐ Checking of the potential leaks, building insulation, and losses in the system causing high energy consumption of A/C, motor, pumps, water, electricity, fuel, etc.
- ☐ Behavioral changes or practices that will lead to energy conservation and savings
- ☐ Review of the business policies, processes, and practices that will lead to better energy efficiency and savings

[c] Estimated Savings = 100 units × (0.06 kW – 0.008 kW) × 8 h/day × 30 days/month = 1,248 kWh/month; Payback Period = (100 units × PHP 250/LED) ÷ (1,248 kWh/month × PHP 10/kWh) = 2 months

[d] Estimated Savings = 10 units × 1.913 kW power requirement × 40% savings × 8 h/day × 30 days/month = 1,836 kWh/month; Payback Period = (10 units × PHP 50,000/unit) ÷ (1,836 kWh/month × PHP 10/kWh) = 27.23 months or 2 years and 3 months

[e] Estimated Savings = 2 units × 1.252 kW power requirement × 10% savings × 8 h/day × 30 days/month = 60 kWh/month; Payback Period = PHP 3,000 sealing material cost ÷ (60 kWh/month × PHP 10/kWh) = 5 months

After being able to identify all the energy performance improvement opportunities, this should be listed in the next table. The other accompanying and supplementing details should likewise be filled out. Additionally, it will be best to organize the identified opportunities and options by their potential time frame. This means that activities are: **(a) short-term** when implementable in one (1) to two (2) years; **(b) medium-term** when implementable between three (3) and five (5) years; and **(c) long-term** for complex ones and implementable in more than five (5) years.

Table 10. Energy performance improvement opportunity tracker

Time Frame	Energy Performance Improvement Opportunity Description	SEU Related?	Which SEU?	Responsible Person or Office	Date Identified	Estimated Monthly (or Annual) Savings				Estimated Non-Energy Benefits	Estimated Installation Cost (PHP)
						Electricity (kWh)	Diesel (L)	Gasoline (L)	Others (specify)		
Short-Term Options	1.										
	2.										
	3.										
	…										
Medium-Term Options	1.										
	2.										
	3.										
	…										
Long-Term Options	1.										
	2.										
	3.										
	…										

■ ■ **TASK 2. Establish and apply criteria for prioritizing opportunities:** The next task in energy review and planning is to prioritize the identified opportunities carefully and strategically. The method of prioritization and the application of selection criteria is always left to the choice of the LGU; however, it must be systematic and ongoing. The methods to prioritize EEC opportunities are discussed in Book 2, Part V (Strategies in Doing an Energy Review).

While the LGU may formulate its own criteria in the prioritization of initiatives, the DOE is also recommending that the following conditions are considered.

- ☐ *Environmental hazards*. Environmentally-critical areas and locations with geohazards must be avoided as areas in commissioning initiatives under the LEECP. Existing waste management procedures and protocols must be established for initiatives pursuant to relevant government regulations.
- ☐ *Economic and financial factors*. Initiatives must promote economic growth and generate jobs in the locality as well as contribute to the generation of cost savings.
- ☐ *Safety concerns*. Initiatives must have minimal safety issues once operational or implemented. Likewise, these must not pose risks to nearby communities and ecosystems.
  Use of energy-efficient technology. Initiatives must prioritize safe, proven, cost-effective, and energy-efficient technology.

■ ■ **TASK 3. Implement a process to update the prioritized energy performance improvement opportunities:** The LGU should set a specific interval when the list of prioritized energy performance improvement opportunities and options will be updated, especially when there are major changes in the facilities, sites, equipment, systems, or energy-using processes that take place. In order to make it coherent, the following must be properly documented.

1. **Process of identification of energy performance improvement opportunities and options.** The method of identifying the opportunities and options must be well defined. It can be through any, or the combination, of the approaches presented in Task 1 or any other tools.
2. **Process of prioritization of energy performance improvement opportunities and options.** The method of selecting and prioritizing opportunities and options must be well defined. It can be through any, or the combination, of the methods presented in Task 2 or any other tools.
3. **Interval of updating the prioritized opportunities.** EEC improvement projects, new internal procedures, changes in sites and energy-using processes, and the availability of resources may all present new opportunities for energy performance improvement, can negate some opportunities, or can affect the prioritization of such opportunities. Therefore, there should be a defined specific interval (annually, biannually, etc.) in updating the prioritized opportunities.
4. **Other pertinent information**.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Identified opportunities and options for the improvement of the LGU's energy performance
- ☐ Applied selection criteria for the prioritization of opportunities and options for the improvement of the LGU's energy performance
- ☐ A documented, defined plan for updating the prioritization of opportunities and options

Phase 4. Determine the Energy Performance Indicators and Energy Baselines

After the energy review, the next activities of the LGU will be the identification of representative and measurable energy performance indicators (EnPIs) and the creation of energy baselines (EnBs) based on collected energy data. EnPIs and EnBs are two key interrelated elements that enable the assessment and, therefore, the proper management of energy performance in an LGU. According to ISO 50001 Section 6.5 defines that the LGU can set its own EnB based on the energy review and that it must set conditions when the EnB should be revised. The following are the subphases of Phase 4.

- ☐ Determine the Energy Performance Indicator (EnPI)
- ☐ Establish an Energy Baseline (EnB)

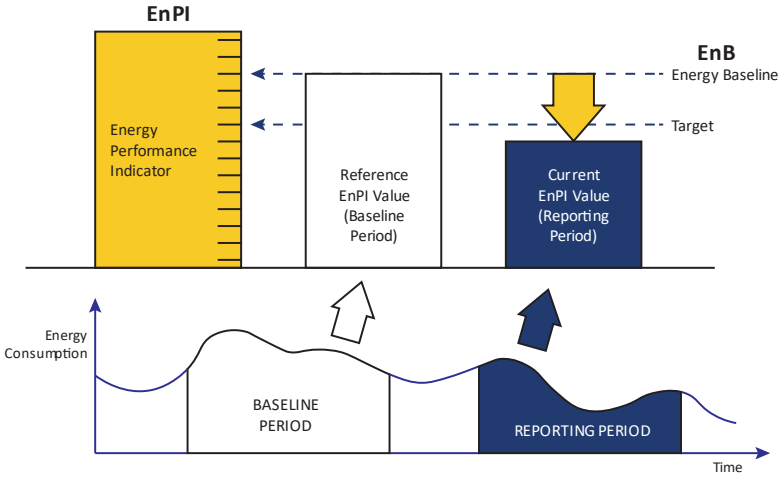

Figure 11. Illustrative definition of EnPI and EnB

SUBPHASE 4.1

Determine the Energy Performance Indicator (EnPI)

WHY IS THIS SUBPHASE ESSENTIAL? The EnPI is a value or measure that quantifies results related to energy efficiency, energy use, and energy consumption in facilities, sites, buildings, systems, processes, and equipment. EnPIs allow any LGU to estimate if any improvement in energy performance has truly been achieved. Where the EnPI is the metric by which to measure energy performance, the EnPI value refers to the actual or calculated number for a specific time period of measure. Consider, for instance, the energy consumption or energy performance of a facility is 50,000 kWh. The kWh is the EnPI while 50,000 is the EnPI value. An EnPI of the single metric type, such as the energy consumption in kWh (in total or broken down by energy use), is adequate to govern and monitor the energy performance of a facility, site, equipment, system, etc. An EnPI may also be in the form of a ratio, such as the energy consumption per unit of another factor in consideration. For public buildings, the examples are: kWh per square meter or kWh/m^2 for energy performance in buildings; kWh/luminaire for lighting; km/L for vehicle fleets; etc. Still another form of an EnPI is a numeric model which requires complex analysis, such as a statistical or simulation model based on engineering theory and the like, by someone competent and skilled.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? It is important to heed the lead already taken by the DOE in terms of the EnPI for consistency and regulatory purposes. Based on the MECR and MFCR forms, the EnPIs in consideration are of the single metric and ratio type, respectively. For the MECR, the energy source is electricity and the EnPI is kWh. For the MFCR, the energy sources are gasoline and diesel and the EnPIs are both in km/L. Using the same course of categorization defined in the previous phases, the boundary of these EnPIs will be per facility, site, building, or department with separate or independent energy accounts.

Table 11. Summary of an LGU's EnPIs for reporting to the DOE

Stakeholder/User of EnPI	DOE
Type of Stakeholder	External
Purpose	Regulatory
Level of EnPI	Broad-level
Boundary of EnPI	Facility-wide
Reporting Period	Depends on the chosen period
Energy Source 1 and EnPI	Electricity: kWh
Energy Source 2 and EnPI	Gasoline: km/L
Energy Source 3 and EnPI	Diesel: km/L
…	…

The MECR contains other information such as the gross area, air-conditioned area, and the occupancy. Thus, other possible EnPIs are kWh/$m^2_{\text{gross area}}$, kWh/$m^2_{\text{air-conditioned area}}$, and kWh/occupant. LGUs can define its own EnPI based on its own needs and the needs of its stakeholders. In this case, it may have internal EnPIs. The DOE and the LGU's top management may require and prefer EnPIs from a broader level to meet informative, legal, and reportorial requirements. On the other hand, an EEC Officer, EEC Focal Person, or any technical staff may benefit from narrower EnPI boundaries (per equipment, machine, etc.) to manage improvements in energy performance. Whatever is the case, the LGU should establish and properly document all the EnPIs to be used. The EnPI value or the numeric value associated in an EnPI may either be the reference EnPI value or the target EnPI value. The reference EnPI value of a facility, site, building, equipment, etc. is dependent on its energy performance as measured during a selected baseline period (which will be discussed in the next subphase). On the other hand, the target EnPI value will depend on the EEC objectives. For instance, if the public park recorded an energy consumption of 20,000 kWh (reference EnPI) for the year 2021 (baseline period) and the goal is to have an energy savings of at least 10% (EEC objective) for the year 2022 (reporting period), then the target EnPI should be 18,000 kWh or less. Putting this insight into the perspective of the tools already introduced in this Guidebook and the predetermined EnPIs for LGUs is the following figure.

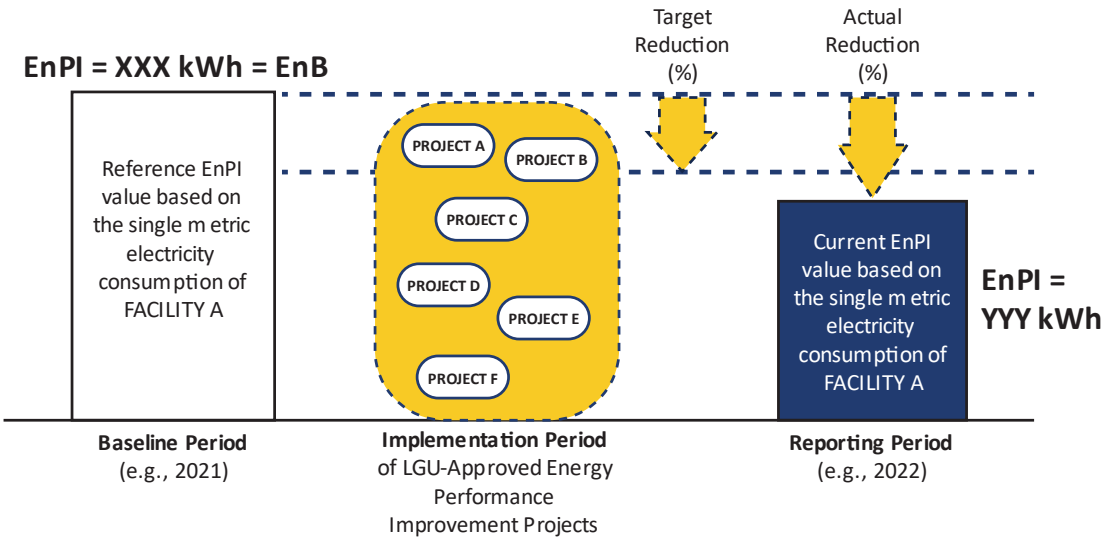

Figure 12. Representation of single metric EnPIs based on the approved energy performance PPAs (exhibits only 1 facility)

Apart from identifying the EnPIs, it is essential that this process should be properly documented along with the following portions.

1. Method used to determine the EnPIs
2. Frequency of reviewing and updating the EnPIs
3. Other pertinent information

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Established EnPIs
- ☐ Documented the method and frequency of updating the EnPIs

SUBPHASE 4.2

Establish an Energy Baseline (EnB)

WHY IS THIS SUBPHASE ESSENTIAL? The EnB is a quantitative reference that characterizes the LGU's energy performance during a specified period. It is an enabler for the assessment of changes in energy performance between two selected periods, allowing for the calculation of energy savings after implementing an improvement opportunity or option. The baseline period refers to the period used to compare the energy performance of a facility, site, building, equipment, system, or process with the reporting period. The most common baseline period is one year to account for the seasonality in the energy demand and relevant variables. The baseline period can also be several years.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? The EnB is set according to the most recent year for which an LGU has energy data of adequate detail. The LGU may use Table 7 in Book 2 Part V (Strategies in Doing an Energy Review) as energy data collection worksheet if it does not have its own template. In the case of a new facility with no operating history, the EnB can be established by estimating, calculating, or simulating the facility's energy consumption. So, after the EnPIs get selected by the LGU, the EnBs are established to serve as a comparative reference against each corresponding EnPIs. The LGU should compare changes in the energy performance from the period for which the EnB has been established (baseline period) and the period being evaluated (reporting period). Please refer to Figure 12 on how the EnB is identified. As of this writing, the current baseline period set by the DOE for legal and reportorial requirements (MECR and MFCR) is the year 2015. In this case, the EnBs will refer to the electricity consumption in kWh of the same year (for the MECR) and the fuel economies of gasoline and diesel in km/L of the same year (for the MFCR). Where there are changes, the said agency or the IAEECC will be releasing relevant circulars.

Table 12. Summary of an LGU's EnBs for reporting to the DOE

Stakeholder/User of EnB	DOE
Type of Stakeholder	External
Purpose	Regulatory
Level of EnB	Broad-level
Boundary of EnB	Facility-wide
Baseline Period	January 2015 to December 2015
Energy Source 1 and EnB	Electricity: kWh
Energy Source 2 and EnB	Gasoline: km/L
Energy Source 3 and EnB	Diesel: km/L
…	…

Just like the EnPI, the LGU may define and set internal baseline periods and EnBs. For instance, if the LGU will be implementing an energy efficiency project for a group of air-conditioning equipment (inclusive of installation and commissioning) in the next two years starting 2022 and the target of completion is by the end of the year 2023, then the full operation of the installed technology will start in 2024. Using Figure 11 as an illustration, the baseline period can be set in 2023 (most recent year prior to 2024) and the EnB (or the reference EnPI) will be referring to the energy consumption of the same group of air-conditioning equipment during 2023 ($EnB_{2023} = EnPI_{2023}$). Moving forward, the EnPI of year 2024 ($EnPI_{2024}$) will then be used to check if there is indeed an improvement in the energy performance. The following are the ways to calculate the energy performance improvements for this example.

The energy savings or energy difference between the baseline period (2023) and the reporting period (2024) will be:

$$Energy\ Savings = Energy\ Difference = EnPI_{2024} - EnPI_{2023}$$

The percent change can also be computed by:

$$Percent\ Change = \left(\frac{Energy\ Difference}{EnPI_{2023}}\right) \times 100$$

In Phase 4, it was discussed that external factors affecting the energy consumption of an energy use are coined as relevant variables. Where relevant variables are already identified as a factor for the energy consumption of a facility, site, equipment, or a system, the corresponding EnB must be normalized. Normalization of the EnB is necessary to have an appropriate comparison of the energy performance between the baseline period and another selected period under equivalent conditions. For all of this, the LGU should establish and properly document all the EnBs to be used. Soon, it is highly possible that LGUs may benchmark their energy baselines and performances with each other. The DOE, as the lead agency in the implementation of the Act, shall develop and maintain a National EEC Database that accounts for the national and local energy consumptions, among others. This way, an LGU can see its standing and further improve its energy performance.

Apart from establishing the baseline periods and the EnBs, it is essential that this process should be properly documented along with the following portions.

1. Method used to determine the EnBs
2. Frequency of reviewing and updating the EnBs
3. Other pertinent information

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Established EnBs
- ☐ Documented the method and frequency of updating the EnBs

Section C. Planning and Operationalization of the LEECP

Phase 5. Formulate a Coherent LEECP Blueprint

Planning includes the systematic procedures for the realization of short-, medium-, and long-term goals. The objective is to ensure the achievement of the LGU's mission, goals, and strategies that are linked with EEC and aligned with relevant national mandates. The previous section provided a systematic approach and strategic assessment of the LGU's energy profile, paving the way to the prioritization among a group of identified energy performance improvement opportunities. This next phase will unequivocally assist LGUs in concretizing the LEECP. The strategy utilized in formulating a coherent LEECP blueprint of an LGU is based on the countercurrent approach, i.e., it combines the top-down and bottom-up approaches in planning. In top-down planning, the objectives from all-encompassing national plans and programs are reviewed and taken in relation to EEC. In bottom-up planning, the results of the systematic, detailed energy review are taken to identify the specific targets which are then gradually integrated into the corresponding framework of EEC objectives. The following are the subphases of Phase 5.

- ☐ Define the Scope and Boundaries of the LEECP
- ☐ Set the Objectives and Targets
- ☐ Incorporate Budgeting Strategy

It is also important to emphasize that vis-à-vis the preparation of the LEECP and its blueprint, the LGU should formulate a clear waste management policy particularly on the disposal of replaced energy-consuming devices, equipment, fixtures, and other relevant items, as per RA 9003 or the Solid Waste Management Act, and other relevant national laws and policies. This management policy, although is not specifically to be included in the LEECP, should be formulated internally to the LGU, which shall assist in the sustainable implementation of the activities of the LEECP, which shall be discussed in Phase 6.

SUBPHASE 5.1

Define the Scope and Boundaries of the LEECP

WHY IS THIS SUBPHASE ESSENTIAL? The scope and boundaries are highly related and enable an LGU to concentrate efforts and resource by defining what the LEECP includes. The scope refers to the set of activities while the boundaries are the physical or organizational limits. An LGU owns 20 public buildings sprawling in its territory but only 10 of these are connected to the local DU. One possible scope is the operations and maintenance (O&M) of the public building connected to the local DU; and the corresponding boundaries are the 10 public buildings connected to the local DU. Another possible scope might be the activities, operations, and processes of all heating, ventilation, and air conditioning (HVAC) equipment installed in the government buildings in its central territory; and the boundary includes the five public buildings located in its central territory.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? Under the GEMP, LGUs should adopt and implement programs that will both reduce its electricity and fuel consumption by at least 10%. This requirement is a government-wide program and so, this will entail all LGU-owned assets and facilities to follow suit. While this might be the case, it is up to the LGU to define the LEECP's scope and boundaries. The LGU may use a variety of methods such as the identification of the largest energy consumers, SEUs, etc. to define the scope and boundaries. An LGU may concentrate its LEECP and resources on a few of the largest energy consumers, SEUs, etc. based on a prioritization method as it might become overwhelmed with a deeper scope and a wider boundary.

Example 1: The LGU may define the scope and boundary per group of electrical equipment (all A/C units, all lighting systems, etc.) in a facility, site, building, etc. Using the example in Book 2 on the Application of the Point System (Method 3), the SEUs were identified based on a set of selection criteria.

- ☐ **SCOPE:** The provision of energy services such as air-conditioning, lighting, water pumping, transporting people between building floors, and applications requiring motors
- ☐ **BOUNDARY:** The city hall of the LGU

Example 2: The LGU may define the scope and boundary per facility, site, building, or department.

- ☐ **SCOPE:** The provision of energy services in public buildings (including the provincial/city/municipal halls and building, parks, street lights, schools, health centers, hospitals, puericultures, libraries, and other facilities) and transportation through the service vehicles owned by the LGU
- ☐ **BOUNDARY:** The public buildings (including the provincial/city/municipal halls and building, parks, street lights, schools, health centers, hospitals, puericultures, libraries, and other facilities) and LGU-owned service vehicles

In order to complete the LEECP's scope and boundary stated in Example 2, the LGU should have a complete list of all buildings and service vehicles that it owns. Likewise, it must identify which among this list will be considered in its LEECP. The strategies, worksheets, and tools presented in Phase 4 will help identify the energy consumption of each of these facilities, sites, or buildings as well as filter which among these are considered as the largest energy consumers or SEUs. Such strategies, worksheets, and tools need to be modified so that the level of comparison will be a facility, site, building, or department against the other ones. The LGU may also intermix Examples 1 and 2 by concentrating on a group of equipment from a group of facilities, sites, buildings, etc.

Table 13. List of buildings and service vehicles owned by the LGU demarcated if included in the scope and boundary

Decision on Inclusion to the Scope and Boundary	Method of Prioritization	Public Building (or Public Building Including the Specific Energy Use)	LGU-Owned Service Vehicle
Included	SEUs	☐ City Hall	☐ All service vehicles of officials
		☐ Public Park (all lighting only)	☐ …
		☐ Sports Complex (HVAC and lighting only)	☐
		☐ …	☐
Not Included	Not SEUs	☐	☐
		☐	☐

Extending the scope and boundary to other development sectors: Whereas applicable, the LGU can also identify the scope and boundary in terms of other development sectors, such as the environment and natural resources, institutional, infrastructure, economic, social, policy, etc. Thus, the LEECP must demonstrate inclusivity through the EEC-responsive PPAs in the LGU's territory.

Suggested PPAs for inclusion in the LGU's LEECP: The PPAs of the LGU's LEECP must be ensured to be as sustainable and as inclusive as possible. Therefore, the PPAs should not only be limited to the public assets of the LGU but also address the public interests. With the LGU leading by example and championing EEC and renewable energy (RE) activities, the relevant requirements and interests of its local stakeholders and sectors must be considered. A few examples of exemplary PPAs which include other sectors are the following. These may lead to an increased private sector participation in public projects and increased investments in the locality, contributing to the enhancement of the economic, social, environmental, and governmental portfolios of the LGU.

- ☐ Environmentally friendly public transportation (e.g., electric vehicles, smart mass transport systems, etc.)
- ☐ Waste-to-energy facility (the revenues of which will directly and positively impact the local community hosting the facility)
- ☐ Natural or energy-efficient wastewater treatment facility
- ☐ Irrigation of agricultural and farm lands using solar/wind technologies and energy-efficient machinery
- ☐ Building of a learning and exhibition center on RE and EEC that will serve as platform for knowledge exchange between local governments and the academe as well as a potential tourism site
- ☐ Promotion and market development of local, EEC-aligned innovations and researches from universities and startups
- ☐ Incentivization/recognition of industries, establishments, and households for putting up RE or implementing EEC measures
- ☐ Incentivization of manufacturers, suppliers, and contractors advancing RE and EEC in the locality
- ☐ Amendment or revision of local policies and ordinances to support EEC

At this stage, the LGU will now be able to properly identify which among its own assets will be included in the LEECP using the information in the scope and boundary. The DOE LEECP Summary Template is intended to give a rundown of the LEECP, including the considered sectors, program/project (milestone targets), proposed activities, period of implementation, and the resources required. This summary matrix alongside the required administrative fields can also be found in Part II (Outline and Content of a Basic LEECP).

The DOE LEECP summary matrix must specify the covered public assets under column 1 (Sector). An example of this is as follows.

Table 14. An example of covered public assets specified by an LGU in the DOE LEECP Summary Template

Sector	Program/Project (Milestone Targets)	Proposed Activities	Period of Implementation	Resources Required
Local Government Buildings, Parks, Streets, and Other Facilities				
1. City Hall				
2. City Hall Annex				
3. Public Park				
4. Public Hospital				
…				
Renewable Energy Installation				
…				
Transport				
…				
Other Development Sectors				
…				

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Defined the scope and boundary of the LEECP
- ☐ The covered public assets of the LGU are specified in the DOE LEECP template

SUBPHASE 5.2

Set the Objectives and Targets

WHY IS THIS SUBPHASE ESSENTIAL? According to the RPS and LGU planning guidelines, goals are sectoral and broad statements while objectives are more specific statements of targets and results. The objectives and targets are interlinked with the Energy Policy (Phase 2), the main intention of which is to ensure a continuous and systematic approach and methodology toward efficient energy use. To achieve its objectives and targets, the LGU should have in place a thorough action plan.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? The planning strategy utilizes the countercurrent approach, i.e., it combines the top-down and bottom-up approaches in planning. Thus, the undertakings are: (1) the LGU reviews the objectives of all-encompassing national/local plans and programs that are related to EEC, such as the CDP, CLUP, NEECP, LCCAP which is anchored on the National Climate Change Action Plan (NCCAP), etc. and (2) the results of the systematic, detailed energy review (Phases 3 and 4) are taken to identify the specific targets which are then gradually integrated into the corresponding framework of EEC objectives. The suggested initial steps are the following. Please refer to the next table to properly review and set the objectives.

1. Get an updated copy of the CDP or CLUP (whichever is available) and go through the goals and associated objectives. For instance, one can focus on the objectives under the sectors of infrastructure, economic, and environmental and natural resources. Secure also a copy of the NEECP[f] and the LCCAP or NCCAP and go through the goals and objectives of the same.
2. Identify which of these objectives address EEC, the reduction of greenhouse gas (GHG) or CO_2 emissions, or the field of energy, in general. Fill in columns 2 (Objective) and 3 (What Does this Objective Address?) of the following table.
3. Identify, as a group, if there is a need to reformulate or enhance the said objective (column 2) to address properly and specifically any of those areas under column 3.
4. If the answer in column 4 is "yes," then provide the reformulated objective under column 5. Otherwise, retain the objective.
5. All reformulated and retained objectives will serve as the main objectives of the LGU's LEECP.

Table 15. Reviewing and setting of objectives

Source	Objective	What Does this Objective Directly Address?			Is there a Need to Formulate a New Objective?		Reformulated Objective/s
		EEC	Energy	GHG Reduction	Yes	No	
CDP	Achieve energy sufficiency	✓	✓		✓		Improve energy sufficiency through the judicious conservation and efficient utilization of energy resources
CDP	Strengthen advocacy on energy conservation measures	✓			✓		Advocate energy conservation measures through the leading of examples in public buildings
CDP	Strengthen advocacy on energy conservation measures	✓			✓		Train EEC Officer and the energy management team for technical competency
NEECP	Make energy efficiency and conservation a way of life	✓				✓	
LCCAP or NCCAP	Reduce local generation of greenhouse gas emissions			✓	✓		Lower GHG emissions by reducing energy consumption from coal-based fuels
…	…						

The suggested next steps are the following. Please refer to the next table to properly align the previously prioritized energy performance improvement opportunities with the LEECP's objectives.

1. Revisit the prioritized energy performance improvement opportunities in Subphase 3.3.
2. Align each of these improvement opportunities and options with the main objectives of the LGU's LEECP from the previous task. It is possible that an option may fall under more than one objective.
3. In the scenario that an objective will not have any option or improvement opportunity falling under it, the LGU should revisit Phase 3 and check the other options that were not prioritized but can help fulfill or achieve the said objective.
4. In the scenario that an energy performance improvement opportunity does not fall under any objective, the LGU must formulate an appropriate objective.

Table 16. Aligning of prioritized energy performance improvement opportunities with the objectives of the LEECP

Prioritized Energy Performance Improvement Opportunities	Objective A	Objective B	Objective C	Objective D	…
OPTION A	✓				
OPTION B	✓	✓			
OPTION C			✓		
OPTION D		✓			
…					

[f] As of this writing, the DOE is now completing the EEC Roadmap and Action Plan for 2020 to 2040 care of the ASEAN Low Carbon Energy Programme (LCEP) which is funded by the UK government's Foreign and Commonwealth Office. The DOE will have to decide if this will also serve as the NEECP. In the absence of the instrument, one may refer to the National Energy Efficiency and Conservation Program which has been put in place since 2004, the EE&C Roadmap 2017 to 2040, and other related plans/programs.

The suggested final steps are the following. Please refer to the next table to properly set the targets emanating from the energy performance improvement opportunities.

1. Using the list of covered public assets of the LGU in Table 14, group each of the prioritized opportunities and options (column 2) per sector and per public asset (column 1).
2. Revisit again each of the prioritized energy performance improvement opportunity. Each improvement opportunity or option with a technical installation component will always have an associated energy savings that has been estimated (please see Table 9 under Phase 3). Record this in column 3.
3. Set the baseline period and record the EnB (column 4). In order to properly set the accuracy of reduction targets, it is recommended that the baseline period is set to the baseline year prescribed by the DOE or the most recent year before the full operation of a project (e.g., the full operation of newly installed A/C units with high EER) where the collected energy data is adequate. Using the guidelines in Phase 4, the EnB will be referring to the kWh consumption (for electricity source) or the km/L fuel economy (for gasoline or diesel source) of the baseline year.
4. Divide the total energy savings per public asset in column 3 with that of the total EnB per public asset in column 4 and multiply the result with 100. This will be the percentage target reduction of the set of improvement opportunities and options under the public asset in consideration.

Table 17. Setting of Quantitative Targets

List of Covered Public Assets	Energy Performance Improvement Opportunities	Estimated Energy Savings	EnB	% Target Reduction
			Baseline: 2015	
1. City Hall	a. Replace all old and inefficient A/C units with high EER and inverter types	53,000 kWh/year	175,300 kWh	
	b. Install variable frequency drives (VFDs) on the water pumps	4,000 kWh/year	37,000 kWh	
	c. …			
Total		**62,000 kWh/year**	**307,200 kWh**	**20.18%**
2. Public Park	a. Replace all metal halide lamps with LED lights	42,000 kWh/year	51,800 kWh	
Total		**42,000 kWh/year**	**51,800 kWh**	**81.08%**
3. City Hall Annex	…			
4. Health Center	…			
5. …				

Aside from the quantitative targets in energy reductions, the LGU may need to define other quantitative and qualitative targets indirectly pertaining to energy reduction which help facilitate and complement a certain objective of the LEECP. For instance, if the LGU has the LEECP objective of "promoting awareness on EEC to its constituents," then some possible targets can be as follows. In addition, the LGU should define the proposed activities for each of these targets.

- ☐ Orientation and training in EEC of X out of Y barangays
- ☐ Orientation and training of X males and Y females, serving as provincial/city/municipal/barangay participants
- ☐ Conduct of X information, education, and communication (IEC) programs on EEC
- ☐ Allocate Y percentage of funds for EEC IEC
- ☐ Produce X materials for use in provincial/city/municipal/barangay dialogue on EEC

At this stage, the LGU can now fill out more sections of the LEECP Summary Template as shown in Table 26.

1. First, using the information provided in Table 17. Setting of Quantitative Targets), formulate each quantitative energy reduction target per LEECP-covered public asset into a statement and place it under column 2 (Milestone Targets). In addition, provide the additional quantitative and qualitative targets indirectly pertaining to energy reduction which have been developed.
2. Next, copy all corresponding energy performance improvement opportunities and options for the same public asset into column 3 (Proposed Activities). Do this for every other opportunity and covered asset.
3. The LGU should also specify the length of implementation of each proposed activity or the prioritized energy performance improvement opportunities in column 4 (Period of Implementation) as determined during energy review.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Defined the objectives and targets of the LEECP
- ☐ The program/project (milestone targets), proposed activities, and period of implementation are specified in the Table 26. The DOE-prescribed LEECP Template

SUBPHASE 5.3

Incorporate Budgeting and Funding Strategy

WHY IS THIS SUBPHASE ESSENTIAL? A strategic plan is a vital tool that LGUs use to help them set achievable goals and objectives that will influence the future and present directions on how such can be reached. In order to make these goals and objectives into reality, the LGU should see which parts of the plan require funding. Linking the plan to the budget is the Local Development Investment Program (LDIP). The IRR of the RA No. 11285 mentions the following provisions in terms of financial arrangements.

- ☐ Section 46 indicates that the LGUs are authorized to enter different financial arrangements for energy efficiency projects.
- ☐ Section 47 indicates that government energy efficiency projects may be pursued through different financial arrangements and modalities following the procedures laid down in any of the following measures: RA No. 9184, otherwise known as the Government Procurement Reform Act; RA No. 6957, otherwise known as Build-Operate-and-Transfer (BOT) Act, as amended by RA No. 7718; RA No. 7160, otherwise known as the Local Government Code of 1991; the 2013 National Economic and Development Authority (NEDA) Joint Venture (JV) Guidelines, as may be amended from time to time; the applicable LGU charter; related laws, rules, and regulations; and other modalities. Furthermore, the IAEECC shall include savings-based services and payments as through additional modality for pursuing government energy-efficiency projects. Likewise, such modalities shall include LGUs being able to repay energy service companies (ESCOs) undertaking energy efficiency projects through applicable repayment schemes based on the cost savings to be generated from the projects and other sources, in accordance with the guidelines issued by the Department of Budget and Management (DBM) on multi-year contracts and other applicable laws.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? As with other plans, implementing the LEECP shall follow the investment programming, budgeting, and implementation periods as provided in the updated Synchronized Local Planning and Budgeting Calendar (SLPBC) issued by the DILG. The schedule for planning and programming usually transpires from November (previous year) to June (incoming year). In order to ensure funding, the list of proposed activities or the prioritized energy performance improvement opportunities and options shall be responsive to EEC issues. Before a portion of the annual general fund budget is allocated for the EEC proposed activities or the prioritized energy performance improvement opportunities through the LDIP, the LGU identifies the resources required/committed for carrying out such planned activities/options and completes the LEECP Summary Template in the process. Aside from the financial resources, one may indicate the needed human resources such as the addition of personnel and/or responsibilities, technical assistances, physical resources such as tools and equipment, software requirements, executions of policies, etc. Guided by the estimated installation or implementation cost determined during the energy review of each proposed activity/option, the LGU should identify all resources required as shown in Annex 11 (partially completed LEECP) of Book 2.

Following the investment programming processes and schedules indicated in the SLPBC, the LGU must review the list of proposed EEC activities or the prioritized energy performance improvement options and have them inputted into the LDIP and Annual Investment Program or AIP summary forms from the DILG (Annex 12 of Book 2). An important thing to take note in accomplishing the LDIP and AIP is the climate change expenditure tagging (CCET) found on the right-hand portion of the forms. CCET is the process of prioritizing and assigning codes to climate change PPAs; and this is done during the preparation of the AIP (Climate Change Commission, 2015). The CCET includes two (2) components: (1) tagging of the activity as to whether it qualifies as a response or measure under climate change adaptation or mitigation and (2) determining the climate change typology code. EEC PPAs contributing to the reduction of GHG emissions help combat the unwanted effects of climate change. Thus, this qualifies EEC PPAs to be labeled with CCET. Based on the DBM, CCC, and DILG JMC No. 2015-01, the LGU determines whether the proposed activities are climate change adaptation or mitigation measures. Examples of climate change adaptation are: addressing drivers of vulnerability (e.g., crop insurance); directly confronting climate change impact (e.g., relocation of flood-prone communities to safer areas); and building resilience to current and future climate risks (e.g., housing construction using climate resilient design standards). Examples of climate change mitigation are: reducing GHG emissions (e.g., energy efficient structures, bike lanes); increasing GHG sequestration (e.g., reforestation); and protecting carbon sinks (e.g., forest-related projects). Since EEC activities impact GHG emissions, then it can be said that most, if not all, should be tagged under climate change mitigation. For the climate change typology code, one should consult with the long list of codes provided by the CCC. As a reference, the climate change typology codes for NCCAP strategic priority 6 of sustainable energy (energy efficiency, power generation, and transportation and communication) can be found in Annex 13.

Aside from financing the PPAs of the LEECP from the LGU Fund, the LGU may submit and endorse their EEC PPAs as listed in their LEECPs to the IAEECC through the DOE for possible funding as Government Energy Efficiency Projects (GEEPS). LGUs are expected to observe the following timelines of every year in their application for GEEPS funding.

Table 18. Annual timelines for Government Energy Efficiency Projects

Date/Period	Activities	Expected Output
January to March 30	Capacity Building for GEEP Proposal Development	Draft GEEP Proposals
June 1 to September 1	Call for GEEP Proposals	Endorsed GEEP Proposal to the IAEECC for approval
September 30	Approval of GEEPS through IAEECC	List of Approved GEEPs for Funding
October – December	Amended GEEP Proposals for Reassessment and Approval of IAEECC	List of Approved GEEPs by the IAEECC
January to February of the Following Year	Expected Deadline of Submission of Proposed Budgets through DBM	Fund availability for GEEPS

To better defend the proposed activities or the prioritized energy performance improvement opportunities in the LEECP Summary Template during technical budget hearings, a project brief covering substantive information should be prepared for each EEC PPA. The LGU may use the project brief outline (Annex 14) from the DILG. Among the contents of this project brief should be the key activities programmed according to time slices, objectives, scope, target clientele or beneficiaries, etc.

Accessing windows of opportunities to fund EEC projects and activities: LEECP actions can be funded out of an LGU's regular budget or explored fund can be sourced. Therefore, having EEC elements mainstreamed into the CDP and CLUP are pivotal to increase the likelihood that the priorities for such actions become realized through inclusion in the annual LGU budgets. LGUs can also access other windows for funding EEC projects. In case the LGU decides to access external funding (financing modality from the government, private sectors, and non-governmental organizations or NGOs), it must rewrite the LEECP into a project proposal and must adhere to the prescribed format of the potential funding agency or partner. A few options in financing EEC projects are as follows.

- ☐ Self-financed EEC projects prompt a facility owner to fund 100% of the overall cost and enjoys 100% of the savings.
- ☐ Energy service companies (ESCOs) provide project development and capital investment while assuming risks, with the client reimbursing a portion of the saved energy expenditure for a contract period.
- ☐ Debt-financed EEC projects allow a facility owner to loan from a bank or leasing company 70% to 100% of the associated cost. Some pioneer financial institutions which have this kind of program are DBP, Land Bank of the Philippines, BPI, and BDO.
- ☐ Third party investments include public-private partnership (PPP), BOT, and JV projects.

EEC financing modalities and tools for LGUs: In order to supplement the discussion of EEC financing modalities and tools, please refer to Book 2, Part VI (Financing Modalities and Tools) of this Guidebook to further explore possible financing options that LGUs and/or its project partners may consider during the planning stage of the LEECP.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Completed DOE LEECP Summary Template
- ☐ Accomplished LDIP and AIP forms with CCET if applicable (following the appropriate investment programming schedules)
- ☐ Project briefs for EEC PPAs
- ☐ Determined financing options

Phase 6. Implement the LEECP

The favorable outcome of any EEC PPA lies not only when it has qualified to be funded but also when proper controls are established. This is to ensure that the local government adheres to austere protocols centered on checking any deviations in the energy performance. Phase 6, thus, includes the following subphases.

- ☐ Set Operational Control
- ☐ Describe Procedures for Design and Procurement
- ☐ Ensure Communication and Documentation of Energy Performance

SUBPHASE 6.1

Set Operational Control

WHY IS THIS SUBPHASE ESSENTIAL? Operations and maintenance (O&M) programs are important because these are where aspects such as deviations and non-conformities in any activity are learned about. O&M controls ensure that critical facilities, sites, equipment, systems, or processes are operated and maintained to achieve the required output and efficient performance related to EEC. Operating and maintaining facilities, sites, buildings, equipment, systems, etc. could help one to avoid energy performance deviations or even deterioration.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? The LGU should set the O&M criteria for all its major facilities, sites, equipment, etc. It is highly likely that there are already existing O&M controls in place. Such criteria can be found and identified through a variety of sources which includes, but not limited to, the following: manufacturer's manual and recommendations; personnel who measures the energy performance; industry standards; and benchmarking performance. A preventive maintenance (PM) can also be used. The PM system is a useful, organized tool for maintaining equipment, systems, and processes by conducting systematic inspections. A few examples of operating criteria and controls are: equipment efficiency; HVAC temperature settings; equipment timer settings; measuring equipment; labelling and signage; documented procedures; and operator competence. Meanwhile, a few examples of maintenance criteria and controls are: lubrication; replacement of filter; cleaning; and leak repair. Moving forward, one should get hold of all O&M documentation relevant to EEC. One may also build upon the following worksheet.

Table 19. O&M criteria and controls worksheet

EEC PPA / SEU	O&M Criteria	Required O&M Frequency	Responsible Person/s
Replace all old and inefficient A/C units with high EER and inverter types	Proper A/C temperature settings	Daily	EEC Focal Person
	Equipment efficiency	Monthly	Contractor
	Replacement of air filter	Monthly	Contractor
	Cleaning of evaporator and condenser coils	Monthly	Contractor
	Inspection of electrical wirings and controls	Monthly	Contractor
…			

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Determined and established O&M criteria and controls

SUBPHASE 6.2

Describe Procedures for Design and Procurement

WHY IS THIS SUBPHASE ESSENTIAL? Both design and procurement are essential aspects which require intervention of the LGU. In the design perspective, one must ensure that the various phases of design of any facility, building, site, equipment, system, etc. done by a third-party organization or contractor will include opportunities for energy performance improvement as specified in public tender documents. In the procurement perspective, the use of more energy efficient technologies and products should be viewed as an opportunity to improve energy performance. The results of the LGU's energy performance should be adequately verified by using appropriate EnPIs and be suitably incorporated in the design and procurement activities of the relevant projects. When procuring energy services, products, and equipment that have or can have impact on the significant energy use, the LGU should inform its suppliers that procurement is partly evaluated based on energy performance. Criteria for assessing energy consumption and efficiency should be established respecting legal requirements that the LGU must follow. And lastly, energy purchase specifications should be defined and documented even in public tenders made by the LGU concerning its energy services and/or activities.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? The LGU must describe in detail how it plans to carry out its procedure in aligning any design or procurement undertakings with EEC. It is suggested that the procedure highlights the following.

1. Describe how the LGU intends to specify and stipulate EEC in the design documents submitted by contractors. Ultimately, the goal of the design document is to show that it adheres to the Energy Policy of the LGU and that it contributes to the improvement of the energy performance.
2. Describe how the LGU intends to cite and particularize EEC in the procurement process through its public tenders and contracts, including the bidding documents submitted by bidders, suppliers, manufacturers, contractors, etc. It must have an inclination and preference toward energy efficient equipment, products, materials, and supplies (green purchasing).

For the design aspect, an LGU should always consult with the latest DOE-published Guidelines on Energy Conserving Design of Buildings (DOE Department Circular No. DC2020-12-0026) and to the Department Circular No. DC2020-06-0016 Prescribing the Minimum Energy Performance for Products (MEPP) Covered By The Philippine Energy Labeling Program (PELP) For Compliance of Importers, Manufacturers, Distributors, Dealers and Retailers of Energy-Consuming Products (ECP). One may also consult with the LGU's Office of the Building Official (OBO) for proper instruction as it is the one involved in the DOE's IEC campaign of the said guidelines, given its role as the primary office responsible for the issuance of building permits. A few questions to consider in the design phase of any EEC project are the following. A worksheet (Table 20) may be used to ensure that EEC concepts are brought forward to the design of a third-party contractor.

- ☐ What is the appropriate energy source for this facility, site, building, equipment, system, etc.?
- ☐ What specific components may be replaced to inculcate EEC over time?
- ☐ What are the best technologies available? What are the options?
- ☐ How will the existing facilities, sites, equipment, or systems be modified?
- ☐ What O&M controls are needed to sustain the intended energy performance?

Table 20. Worksheet for energy considerations in design (U.S. DOE & Lawrence Berkeley National Laboratory, 2021)

Project Description						
Replacement of the city hall's old and inefficient A/C units with high EER and inverter types						
Design Description (describe if the design is for a new facility, new equipment/system, renovation of a facility, renovation/modification of equipment/system, etc.)						
New equipment						
Facilities, sites, equipment, and systems involved in design that significantly impact energy performance	**Energy source**	**Other energy source options**	**Appropriate technology and alternatives for improving energy performance**	**Specify need for additional O&M**	**Entity responsible for the design**	**Improvements which can be expected**
1. Window-type A/C units	Electricity	Solar energy	a. A/C units with high EER b. A/C units with inverter technology c. Multi-split A/C utilizing the variable refrigerant volume (VRV) system d. …	Yes, using manufacturer's manual	Contractor ABC	Significant energy savings between 40% to 60%
2. …	…	…	…	…	…	…

For the procurement aspect, it is well-known that competitive bidding is the default method of procurement.[g] In the past, reference to green labels or other tags as requirement in the bidding documents is not allowed since it will limit competition; the procuring entity must formulate the specifications as generic as possible (Government Procurement Policy Board, 2017). Recent resolutions from the Government Procurement Policy Board (GPPB), however, started to adopt certain green public procurement measures. GPPB Resolution Nos. 20-2016 and 16-2017 state that when the energy performance standards and labeling requirements are being referred to, the Minimum Energy Performance for Sectors (MEPS)[h] can be used by procuring entities in setting technical specifications for the procurement of goods. Also, GPPB Resolution No. 25-2017 allows for the procurement of common-use supplies and equipment (CSE) such as LED lights and non-CSEs such as computers, A/C units, vehicles, refrigerators, and copiers as guided by the green technical specifications set forth in the Green Public Procurement Roadmap. Such technical specifications of energy consuming products must also remain consistent with the DOE Department Circular No. DC2020-06-0016 as well as the IAEECC Resolutions 2 and 3. Some examples of purchases related to an EEC project can include the following.

- ☐ Engineering and operator services
- ☐ Consultants
- ☐ Add-on equipment
- ☐ Replacement/repair parts or equipment
- ☐ Maintenance materials and services
- ☐ Supplies and input materials
- ☐ O&M controls

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Documented the design and procurement procedures, considering the realization of EEC goals and objectives
- ☐ Specified and stipulated EEC requirements in relevant design and procurement documents authored by the LGU and/or submitted by prospective bidders, contractors, suppliers, etc.

SUBPHASE 6.3

Ensure Communication and Documentation of Energy Performance

WHY IS THIS SUBPHASE ESSENTIAL? The energy performance of the LGU should always be communicated and documented properly. Communication is done internally and externally. Documentation is done to define and clarify the functionality of a systematic management of energy. Both activities provide existing and new employees (as well as external stakeholders) of the LGU with guidance and orientation on the specific policies, processes, plans, operations, and activities related to EEC. Any person working for or on behalf of the LGU should receive appropriate communications and be able to make their own comments or suggestions to improve performance. LGUs should also include energy suppliers, energy products' suppliers, and any other relevant person or organization who can positively or negatively affect the LGU's own energy performance. Likewise, the LGU should have a set of documentation, including how it ensures control of this documentation.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? Internal and external communications (within the LGU), at the minimum, should be characterized with the following information.

[g] This consists of the advertisement, pre-bid conference, eligibility screening of prospective bidders, receipt and opening of bids, bid evaluation, post-qualification, and contract award.
[h] MEPS refers to the minimum level of energy performance for the commercial, industrial, and transport sectors set by the DOE.

- ☐ The type of information to be communicated (electricity and cost savings generated by lighting retrofit at the city hall, the new Energy Policy of the province/city/municipality, e-trike public transportation pilot project, assignment of EEC responsibilities in the LGU, etc.)
- ☐ The date the communication will happen (first Monday of every month, weekly, etc.)
- ☐ The audiences (all board members only, all councilors only, all LGU staff, etc.)
- ☐ The method of delivery of the communication (press releases, meetings, presentations, websites, e-mails, internal memos, postings, etc.)
- ☐ The person in charge of the communication (governor, mayor, EEC Officer, Public Information Office or PIO, etc.)

On the other hand, documented information may come in the form of documents (which provide action guidelines) and records (which provide information or results of activities). Some examples of documents that the LGU must maintain are energy and EEC policies, equipment and appliance manuals, operational and system procedures, forms, plans and programs, blueprints and schematic diagrams, equipment standards and specifications, etc. Some examples of reports that the LGU must retain for reference are energy and EEC reports, spreadsheets, data analyses, minutes of meetings, certificates of trainings and workshops, etc.

For the LGU to be guided with the task of communicating and documenting information and data about its energy performance, it must document the processes it will pursue.

1. **Process of communicating the energy performance.** The approach in communication should be well defined. Start by defining the current approach of the LGU in communicating any information and making modifications as necessary related to EEC.
2. **Process of documenting the energy performance.** The approach in documentation should be well defined. Start by defining the current approach of the LGU in documenting any information and making modifications as necessary related to EEC.
3. **Other pertinent information**.

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Defined, written approaches in communication and documentation
- ☐ Communicated and documented relevant information and data on energy performance for the LGU's internal and external stakeholders

Section D. Monitoring, Evaluation, and Improvement of the LEECP

Phase 7. Monitor and Analyze the Energy Performance

A monitoring and evaluation (M&E) system is critical in the entire planning process. It helps LGUs track the progress of EEC actions and ensure that PPAs remain effective in meeting the overarching objectives and the challenges on the ground. The following are the subphases of Phase 7.

- ☐ Perform Monitoring, Measurement, and Analysis
- ☐ Execute an Internal Audit of the LEECP

SUBPHASE 7.1

Perform Monitoring, Measurement, and Analysis

WHY IS THIS SUBPHASE ESSENTIAL? The LGU should have a suitable M&E system in place. Furthermore, it should be able to properly measure the energy use. Monitoring of the energy consumption and its trends is important to gauge if the LGU is going to achieve its targets. Only through the establishment of a clear monitoring progress can considerable results be achieved most effectively. The LGU should have a clear measurement plan and ensure accurate data, as well as be able to address substantial deviations in performance.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? It is recommended that the LGU comes up with a monitoring plan as part of its documentation. It must describe its practices in monitoring, measurement, and analysis. For energy performance, the LGU must determine and carry out the following:

- ☐ What are the things needed to be monitored and measured?
- ☐ What are the methods to be used to ensure valid results from monitoring, measurement, analysis, and evaluation?
- ☐ How often must monitoring and measurement be done?
- ☐ When will the analysis and evaluation of results be done?

The LGU must monitor and measure the following key characteristics of operations that influence energy performance:

- ☐ Energy sources, energy use, and energy consumption
- ☐ SEUs
- ☐ Relevant variables affecting energy consumption
- ☐ Future energy use and consumption
- ☐ EnPIs
- ☐ Action plan completion and effectiveness in achieving objectives and targets
- ☐ Prioritized energy performance improvement opportunities
- ☐ Cost-efficiency and equity
- ☐ Customer satisfaction
- ☐ Others

Some of the data needed to monitor these key characteristics are already part of the LGU's energy data collection plan. Please refer to the following:

1. Subphase 1.4 (Submit Monthly Electricity Consumption Report)
2. Phase 1.5 (Submit Monthly Fuel Consumption Report)

3. Phase 3 (Implement an Energy Review)
4. Phase 4 (Determine the Energy Performance Indicators and Energy Baselines)

The following worksheet can be helpful in determining and deciding when monitoring and measurement will be done and when the results will be evaluated and analyzed. Most of the elements in this table have already been discussed in the previous phases and sections. Calibration refers to the minimization of any measurement uncertainty with any measuring device such as energy meters or portable meters. On the other hand, deviations refer to any variance in the monitored or measured energy performance. Examples of these are change in equipment efficiency, percentage increase or decrease in electricity consumption, failure to meet objectives and energy targets, etc. Thus, the LGU should set specific criteria for significant deviations that require an action. Examples of significant deviations that LGUs may set are 5% increase in fuel consumption, 10% increase in electricity consumption, etc.

Table 21. Monitoring, measurement, and evaluation plan worksheet

Key Characteristics, Equipment, Facility, Site, System	Data to be Collected	Method of Monitoring or Measurement	Frequency of Monitoring or Measurement	Person or Department Responsible	Calibration Requirement	Data Repository	Method of Data Analysis	Significant Deviations Requiring an Action
Facility A	Electricity consumption	MECR form (through utility bills)	Monthly	EEC Officer	None (electricity meters are owned by the DU)	Central energy data repository of the EECO (DOE also receives a copy)	Comparative analysis	10% increase in electricity consumption over the previous month
…	…	…	…	…	…	…	…	…
EnPI of all A/C units of the City Hall	Electricity consumption in kWh/m^2	Submetering	Monthly	EEC Focal Person of City Hall	Yearly calibration of the submeter	Central energy data repository of the EECO	Comparative analysis (EnPI versus EnB)	Setting of thermostats below 24°C
…	…	…	…	…	…	…	…	…

As mentioned, a significant deviation requires an investigation and response. The results of such an investigation must be recorded and documented with the following details.

- ☐ Time frame
- ☐ Activities undertaken
- ☐ Resources and persons consulted
- ☐ Meters and equipment used
- ☐ Evaluation and analysis results
- ☐ Response/s
- ☐ Effectiveness of response/s

Implemented projects need to be monitored accordingly. This table may be modified to accommodate additional criteria.

Table 22. Monitoring of implemented projects

Implemented Projects	Implementation Date	SEU Addressed	Baseline Consumption	Monitoring Plans/Methods	Improvement in SEU Performance	Changes in Action Plan	Improvement Opportunities Identified
Replace all old and inefficient A/C units with high EER and inverter types	August 2022	Air conditioning equipment	EnB = 175,319.04 kWh (2019)	Checking of EnPI by 2022	30% reduction in EnPI	None	Propose replacement of old A/C units with more efficient ones in other buildings and offices
…	…	…	…	…	…	…	…

Another tool that LGUs can accomplish is the end-of-term accomplishment report from the DILG. The purpose of this action is to monitor disbursements of expenditures of EEC options.

Table 23. End-of-term accomplishment report (DILG, 2017)

End-of-Term Accomplishment Report Year _____							
Programs and Projects per Sector	**Output Indicators**	**Target**	**Accomplishment**	**Beneficiary Sector**	**Area Covered**	**Estimated Project Cost (PHP)**	**Actual Disbursement**
1. Social							
2. Economic							
3. Infrastructure							
4. Environment							
5. Institutional							

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Formulated a monitoring, measurement, and evaluation plan
- ☐ Prepared an investigation and response mechanism for significant deviations in energy performance
- ☐ Prepared a monitoring worksheet of implemented EEC projects
- ☐ Formulated an accomplishment report of EEC projects

SUBPHASE 7.2

Execute an Internal Audit of the LEECP

WHY IS THIS SUBPHASE ESSENTIAL? An internal audit process must be conducted in order to improve energy performance and to conform to the organization's own requirements, Energy Policy, objectives, and energy targets. Internal audits can be done by any employee of the LGU who can ensure objectivity and impartiality.

HOW IS THIS CARRIED OUT? HOW IS THIS DOCUMENTED? Appoint an internal audit program manager. This may refer to the EEC Officer, the EECO along with EE focal persons per department or in some cases, the City Engineering Office. Auditors should conduct audits to ensure objectivity and impartiality of the audit process. Sensible guidelines should be strived for so that internal auditors do not audit their own process. If there is no local competence within the LGU, it can also be subcontracted to an external auditor. Develop an internal audit plan for each internal audit (Table 24). It often includes information such as objectives and scope of the audit, auditor responsible, etc.

- ☐ Examples of area or process to be audited include, but not limited to, the Energy Policy, energy review, SEUs, context of the organization, objectives and targets, training plans, O&M, M&E, etc.
- ☐ Examples of common audit objectives are to analyze and evaluate the energy performance improvement opportunities, LGU's own requirements, Energy Policy, objectives, and energy targets.

Table 24. Template for internal audit plan

Audit Date				
Audit Scope				
Audit Objective				
Audit Team				
Area or Process to be Audited	**Start Time and End Time**	**Auditor/s**	**Requirements to be Audited**	**References**

Determine the frequency of internal audits, and regularly conduct the scheduled internal audits. The interval may be monthly, quarterly, annually, or at some other frequency consistent with the LGU's needs. When conducting an internal audit, the assigned auditor should gather objective evidences through the review of documents, examination of data and records, interview of relevant personnel, observation of activities and processes, etc. Report the internal audit findings and results to relevant management (Table 25). These may include positive findings, nonconformity reports, concerns, corrective action requests, etc. This table may be modified according to the requirements of the LGU.

Table 25. Form for internal audit findings and results

RECORD OF INTERNAL AUDIT FINDINGS AND RESULTS	
Auditor	**Date**
Facts Concerning the Findings and Results	
Statement of Criteria (Requirement) These may include positive findings, nonconformity reports, concerns, corrective action requests, etc.	**Objective Evidence (Statement of Finding)** This can be gathered through a review of documents, examination of data and records, interview of relevant personnel, observation of activities and processes, etc.
Requirement Reference (Legal, ISO, etc.) This refers to the basis of any nonconformity or concern. Point out the legal requirement. LGUs may also refer to the ISO 50001 as reference.	**Documentation Reference** This is the referral document or record (in the LEECP or EnMS) that the objective evidence points out.
Signature of Auditor	

WHAT ARE THE EXPECTED RESULTS OR OUTPUTS?

- ☐ Appointed an internal audit program manager
- ☐ Developed the internal audit plan
- ☐ Determined the frequency of internal audits
- ☐ Regularly conducted the scheduled internal audits
- ☐ Recorded and reported the internal audit findings and results

PART II. Outline and Content of a Basic LEECP

The LEECP refers to a collaborative and multi-stakeholder comprehensive framework, governance structure, and programs aligned with the EEC Act and the NEECP, prepared by the LGU for local energy efficiency and conservation with defined targets, feasible strategies, and regular monitoring and evaluation. This part contains the outline and content of a basic LEECP that LGUs can refer to. The following outline is based on the prescribed format of the DOE. An example of a partially filled-out DOE LEECP Summary Template can be found in Table 14 of Part 1 and in Book 2 Annex 11.

Table 26. The DOE-prescribed LEECP Template

DEPARTMENT OF ENERGY
Energy Center, Rizal Drive, Bonifacio Global City, Taguig City

LOCAL ENERGY EFFICIENCY AND CONSERVATION PLAN
For the Year _____

Name of Local Government Unit: _____
Address/Location (Province, City, Municipality): _____
Region: _____

Sector	Program/Project (Milestone Targets)	Proposed Activities	Period of Implementation	Resources Required
Local Government Buildings, Parks, Streets, and Other Facilities				
Renewable Energy Installation				
Transport				

Prepared by:

_____
Signature over Printed Name of the
EEC Officer / EEC Focal Person

Position: _____
Email Address: _____
Date Submitted: _____

Approved by:

_____
Signature over Printed Name of the
Chief Executive

Position: _____
Email Address: _____
Date Submitted: _____

The LEECP template is comprised of the following major fields:

1. **SECTOR.** This refers to the segmentation of different areas, grouped according to common characteristics. The main sectors identified include: (a) Local government buildings, parks, streets, and other facilities; (b) Renewable energy installation; and (c) Transport. For instance, local government buildings are represented by LGU-owned assets and facilities (local government complexes and annexes, executive/legislative hall buildings, department offices, training centers and exhibition sites, public schools, gymnasiums and public sports facilities, public hospitals and health centers, libraries, public parks, and street lights, among others). Whereas applicable, the LGU can also identify the LEECP's scope and boundary in terms of other development sectors, such as the environment and natural resources, institutional, infrastructure, economic, social, policy, etc.
2. **PROGRAM/PROJECT (MILESTONE TARGETS).** This field pertains to any LGU-proposed programs/projects that are to be financed under the General Appropriations Act (GAA), by local funds, or by external partners. This field presents and explains the programs and projects of the LGU given the LEECP's objectives. The milestone targets are broad in nature and usually capture several activities. For instance, the LGU may define an energy efficiency and conservation program in its local government complex to comply with the GEMP requirement of having at least a 10% reduction in energy consumption per month.
3. **PROPOSED ACTIVITIES.** This field relates to the specific activities to be undertaken in order to meet the objectives of the program/project and the milestone targets.
4. **PERIOD OF IMPLEMENTATION.** The period of implementation applies to the coverage duration of carrying out a specific proposed activity.
5. **RESOURCES REQUIRED.** The LGU identifies the resources required/committed for carrying out such planned activities and options. Aside from the financial resources, one may indicate the needed human resources such as the addition of personnel and/or responsibilities, technical assistances, physical resources such as tools and equipment, software requirements, executions of policies, etc. Guided by the estimated installation or implementation cost determined during the energy review of each proposed activity/option, the LGU should identify all resources required.

Executive summary of the LEECP: A one (1) page executive summary needs to be provided on top of the LEECP Summary Template. It is intended to be a narrative description highlighting the: problems or goals the LEECP is solving; brief outline of the recommended solutions; desired outcomes such as energy cost savings, reduction of GHG emissions, etc. for the planning period; and a conclusion about the importance of the plan.

Guidelines for the LEECP's duration: As of this writing, the IAEECC has yet to issue a resolution regarding the recommended planning period of the LEECP. The EEC-IRR stipulates that the LEECP is intended to be integrated into the development plan. Thus, the LGU may consider planning for a period spanning six (6) years and updating the plan every three (3) years. Remaining PPAs which cannot be implemented within the time horizon must be reflected in the next updating of the LEECP.

Annexing the output documents of each phase and subphase into the LEECP: The LEECP template is simple and straightforward, and Part I presents how it can be filled out with strategy and proper structure. Please note that the minimum DOE requirements are those specified under Phase 1 as well as the LGU Energy Code under Phase 2. Meanwhile, the expanded list of requirements covers the remaining output documents of the other phases and subphases. Thus, in order to promote the transparency of the planning process, it is highly suggested that the LGU annexes, in its LEECP, the output documents of each section, phase, and subphase outlined in Part I (Table 27). It includes, among many, the compliance to legal requirements, energy review, and monitoring and evaluation.

Table 27. Output Documents and Expected Results of Part I

Part I Sections, Phases, and Subphases	Output Documents and/or Expected Results
Section A. Preparatory Compliance in the Formulation of a LEECP	
Phase 1. Comply with the Government Energy Management Program (GEMP)	
Subphase 1.1. Establish an Energy Efficiency and Conservation Office (EECO)	☐ An Executive Order establishing an EECO
Subphase 1.2. Designate an Energy Efficiency and Conservation Officer (EEC Officer)	☐ An Executive Order designating an EEC Officer ☐ An Executive Order appointing a management board or TWG (optional) ☐ Accomplished and submitted EEC Officer form
Subphase 1.3. Designate an Energy Efficiency and Conservation Focal Person (EEC Focal Person)	☐ An Executive Order designating an EEC Focal Person ☐ Accomplished and submitted EEC Focal Person form
Subphase 1.4. Submit Monthly Electricity Consumption Report	☐ Filled out MECR form showing historical and current electricity consumptions ☐ Facilities and buildings preliminary identified to have significant energy consumption
Subphase 1.5. Submit Monthly Fuel Consumption Report	☐ Filled out MFCR form showing historical and current fuel consumptions ☐ Facilities, buildings, or departments preliminary identified to have significant energy consumption
Phase 2. Establish a Vision Anchored on the Local and National EEC Agenda	
Subphase 2.1. Document the Legal Requirements, Organization, and Context	☐ Brief description of the LGU's procedure in getting informed with new and updated laws ☐ Documented legal requirements ☐ A list of internal and external factors affecting the LGU's energy and EEC performance ☐ A context analysis of such internal and external factors, such as a SWOT or PESTLE analysis ☐ An action list based on the SWOT or PESTLE analysis
Subphase 2.2. Develop an Energy Policy	☐ A publicly declared Energy Policy of the LGU ☐ LGU officials and employees start to commit to the goals of the Energy Policy
Section B. Strategic Assessment of the Energy Profile	
Phase 3. Implement an Energy Review	
Subphase 3.1. Collect and Analyze Energy Data	☐ An energy data collection plan ☐ Determined appropriate energy data analysis method/s ☐ Identified current energy sources, organized based on the facility, building, or department ☐ Identified energy uses ☐ Identified relevant variables affecting energy consumption ☐ Collected and organized energy data ☐ Identified further data needs necessary for an energy review, such as the analyzed past and present energy uses and energy consumption and estimated future energy uses and energy consumption
Subphase 3.2. Determine Significant Energy Uses	☐ Applied selection criteria to determine the SEUs ☐ Identified the relevant variables affecting the energy consumption of SEUs ☐ Identified all persons affecting the performance of SEUs ☐ A documented, defined plan for updating the selection of SEUs
Subphase 3.3. Identify and Prioritize Energy Improvement Opportunities	☐ Identified opportunities and options for the improvement of the LGU's energy performance ☐ Applied selection criteria for the prioritization of opportunities and options for the improvement of the LGU's energy performance ☐ A documented, defined plan for updating the prioritization of opportunities and options
Phase 4. Determine the Energy Performance Indicators and Energy Baselines	
Subphase 4.1. Determine the Energy Performance Indicator (EnPI)	☐ Established EnPIs ☐ Documented the method and frequency of updating the EnPIs

Subphase 4.2. Establish an Energy Baseline (EnB)	☐ Established EnBs ☐ Documented the method and frequency of updating the EnBs
Section C. Planning and Operationalization of the LEECP	
Phase 5. Formulate a Coherent LEECP Blueprint	
Subphase 5.1. Define the Scope and Boundaries of the LEECP	☐ Defined the scope and boundary of the LEECP ☐ The covered public assets of the LGU are specified in the DOE LEECP Summary Template
Subphase 5.2. Set the Objectives and Targets	☐ Defined the objectives and targets of the LEECP ☐ The program/project (milestone targets), proposed activities, and period of implementation are specified in the DOE LEECP Summary Template
Subphase 5.3. Incorporate Budgeting and Funding Strategy	☐ Completed DOE LEECP Summary Template ☐ Accomplished LDIP and AIP forms with CCET if applicable (following the appropriate investment programming schedules) ☐ Project briefs for EEC PPAs ☐ Determined financing options
Phase 6. Implement the LEECP	
Subphase 6.1. Set Operational Control	☐ Determined and established O&M criteria and controls
Subphase 6.2. Describe Procedures for Design and Procurement	☐ Documented the design and procurement procedures, considering the realization of EEC goals and objectives ☐ Specified and stipulated EEC requirements in relevant design and procurement documents authored by the LGU and/or submitted by prospective bidders, contractors, suppliers, etc.
Subphase 6.3. Ensure Communication and Documentation of Energy Performance	☐ Defined, written approaches in communication and documentation ☐ Communicated and documented relevant information and data on energy performance for the LGU's internal and external stakeholders
Section D. Monitoring, Evaluation, and Improvement of the LEECP	
Phase 7. Monitor and Analyze the Energy Performance	
Subphase 7.1. Perform Monitoring, Measurement, and Analysis	☐ Formulated a monitoring, measurement, and evaluation plan ☐ Prepared an investigation and response mechanism for significant deviations in energy performance ☐ Prepared a monitoring worksheet of implemented EEC projects ☐ Formulated an accomplishment report of EEC projects
Subphase 7.2. Execute an Internal Audit of the LEECP	☐ Appointed an internal audit program manager ☐ Developed the internal audit plan ☐ Determined the frequency of internal audits ☐ Regularly conducted the scheduled internal audits ☐ Recorded and reported the internal audit findings and results
Phase 8. Modify and Rectify the Plan	
Subphase 8.1. Plan for a Management Review	☐ Specified and defined the process of management review ☐ Carried out a management review, the key decisions of which become actionable
Subphase 8.2. Perform Corrective Actions and Continuous Improvement	☐ Nonconformities and significant deviations are addressed through corrective actions ☐ Demonstrated continuous improvement in EEC

References

Asian Development Bank. (2017). *Pathways to Low Carbon Development for the Philippines.* Mandaluyong City.

Ateneo School of Government. (2020). *Indicative Competency Dictionary.* Quezon City: Access to Sustainable Energy Programme - Clean Energy Living Laboratories (ASEP-CELLs).

BizEE Software. (2021). *Degree Days Calculated Accurately for Locations Worldwide*. Retrieved from Degree Days: Weather Data for Energy Saving: https://www.degreedays.net

Climate Change Commission. (2015). *Climate Change Expenditure Tagging for Local Government.* Manila: Climate Change Commission.

Cosenza, E., Devetta, M., Rošā, M., Žogla, L., Barisa, A., Toma, M., & Stiff, G. (2019). *Energy Management System (EnMS) Guidebook for Local Authorities.* Compete4SECAP (C4S). Retrieved from https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5bd36717e&appId=PPGMS

DILG. (2017). *Local Planning Illustrative Guide: Preparing and Updating the Comprehensive Development Plan (CDP).* Quezon City: Department of the Interior and Local Government.

DILG BLGD. (2008). *Rationalizing the Local Planning System.* Quezon City: Department of the Interior and Local Government - Bureau of Local Government Development.

DOE. (2018). *Philippine Energy Plan 2018-2040.* Taguig City: Department of Energy.

EU SWITCH Asia Programme. (2017). *Energy Efficiency and Conservation Roadmap 2017 to 2040.* Taguig City: Department of Energy.

Eurostat. (2020, September 9). *Energy Statistics - Cooling and Heating Degree Days*. Retrieved from European Commission: https://ec.europa.eu/eurostat/cache/metadata/en/nrg_chdd_esms.htm

Fletcher, A. (2018). *ISO 50001:2018 Energy Management System Implementation Guide.* National Quality Assurance (NQA).

Francis, N., & Feiock, R. (2011). *A Guide for Local Government Executives on Energy Efficiency and Sustainability.* Washington: IBM Center for the Business of Government.

Government Procurement Policy Board. (2017). *The Philippine Green Public Procurement Roadmap: Advancing GPP Until 2022 and Beyond.* Pasig City: Government Procurement Policy Board - Technical Support Office (GPPB-TSO).

Johnson, G., Scholes, K., & Whittington, R. (2008). *Exploring Corporate Strategy: Text and Cases.* Harlow: Prentice Hall.

Mias-Cea, M., Mejillano, P., Gentoral, F., & Borlon-Aparicio, J. (2017). *Book 3: Enhanced LGU Guidebook on the Formulation of Local Climate Change Action Plan (Process Guide).* Pasig City: Department of the Interior and Local Government (DILG) - Local Government Academy (LGA).

Mias-Cea, M., Mejillano, P., Gentoral, F., & Borlon-Aparicio, J. (2017). *Book 4: Enhanced LGU Guidebook on the Formulation of Local Climate Change Action Plan (References).* Pasig City: Department of the Interior and Local Government (DILG) - Local Government Academy (LGA).

Office of Energy Efficiency & Renewable Energy. (2021). *Introduction to eGuide Level 2 for ISO 50001*. Retrieved from Advanced Manufacturing Office eGuide: https://www1.eere.energy.gov/manufacturing/eguide/iso_step_2_5.html

Parsons, N. (2021, February 2). *What is a SWOT Analysis and How to Do It Right (With Examples)*. Retrieved from LivePlan: https://www.liveplan.com/blog/what-is-a-swot-analysis-and-how-to-do-it-right-with-examples/

U.S. DOE, & Lawrence Berkeley National Laboratory. (2021). *Planning: Energy Data Collection and Analysis*. Retrieved from 50001 Ready: https://navigator.lbl.gov/

United Nations Industrial Development Organization. (2021). *Determine Significant Energy Uses*. Retrieved from UNIDO eGuide: Energy Management System (EnMS): eguide.ecdl.su/eguide/3/3

Wimmer, R., Guivencan, C., & Materum, C. (2015). *Reduce Training Manual.* Manila: EU SWITCH-Asia's Zero Carbon Resorts (ZCR) Project.

World Energy Council. (2019). *Localising the Grand Transition: Enabling Citizen Participation and Encompassing Local Government (Future Energy Leader Position Paper).* Washington: Future Energy Leaders, Active Citizenship Taskforce.