Chapter VII. ENERGY EFFICIENCY AND CONSERVATION

Energy efficiency and conservation (EE&C) is fast evolving into a key policy solution to high energy cost and the threat of climate change. It is also seen as a key strategy to ensure sustainable growth and development of the country's energy future. The overall objective of EE&C is to reduce energy intensity – that is the energy consumed per unit of GDP.

To put this objective into reality, the DOE crafted the Energy Efficiency and Conservation Roadmap to highlight the strategies and approaches to trim down energy intensity across economic sectors – residential, transportation, industrial, commercial and agricultural sectors.

Further, Republic Act (RA) 11285 or the *"Act Institutionalizing Energy Efficiency and Conservation, Enhancing the Efficient Use of Energy, and Granting Incentives to Energy Efficiency and Conservation Projects"* was signed by President Rodrigo R. Duterte on 12 April 2019. This long-awaited policy measure came as a result of the DOE's relentless effort to pursue its advocacy to curb energy demand without sacrificing economic productivity. Secretary Alfonso G. Cusi signed the Implementing Rules and Regulations (IRR) on 22 November 2019, and became effective on 21 December 2019.

A. ASSESSMENT

1. *Energy Efficiency and Conservation Act of 2019*

RA 11285 establishes a framework for introducing and institutionalizing fundamental policies on EE&C, promoting the efficient and judicious use of all energy resources, and increasing the use of energy-efficient and renewable-energy technologies. All government agencies and government-owned and controlled corporations (GOCCs) are directed to adopt energy efficiency measures and ensure implementation of such in their daily operations – offices, facilities, and vehicles, among others. It will create an Inter-Agency Energy Efficiency and Conservation Committee (IAEECC) for the evaluation and approval of government energy efficiency projects, as well as provide strategic direction for the implementation of the Government Energy Management Program (GEMP).

A National Energy Efficiency and Conservation Plan (NEECP)[105] will also be formulated to serve as the national comprehensive framework on EE&C programs detailing sectoral targets and

[105] The DOE has been implementing the National Energy Efficiency and Conservation Program since 2004, which covers Information, Education and Communication Campaign, Energy Labelling Program, Energy Management Program and GEMP, among others.

strategies, as well as a monitoring and evaluation scheme. The local government units (LGUs) must also come up with their Local Energy Efficiency and Conservation Plan (LEECP), which should be aligned with NEECP.

Likewise, an Energy Efficiency Conservation Office (EECO) will be established to oversee and monitor the implementation of EE&C plans and program.

Salient features of the EE&C Act include the following:

- Categorization of establishments as Type 1 (0.5 to 4.0 GWh annual consumption) and Type 2 (>4.0 GWh annual consumption);
- Designation of a Certified Energy Conservation Officer (CECO) for Type 1, and a Certified Energy Manager (CEM) for Type 2;
- Development and compliance to Minimum Energy Performance (MEP) standards for the commercial, industrial, and transport sectors, and energy-consuming products covering appliances, lighting, electrical equipment, and machinery, among others;
- Development and enforcement of a mandatory energy efficiency rating and labeling system for energy-consuming products (i.e. air-conditioners, refrigerators, and television sets), and performance labeling for vehicle manufacturers, importers, and dealers;
- Implementation of the Guidelines on Energy Conserving Design on Buildings for the construction of new buildings by the LGUs; and,
- Submission of the Annual Energy Consumption and Conservation Report (ECCR) by the 15th of April of every year to the DOE.

Under the MEP and labelling provisions, no manufacturers, distributors and importers are allowed to sell energy-consuming products unless the said products comply with MEP and labelling requirements.

2. *Cross-Sectoral Energy Performance and Rating Systems*

The EE&C Act sets up a data collection mechanism where large energy-consuming sectors (commercial, industrial and transport) shall submit to the DOE their respective annual consumption report. To effectively implement this provision, a comprehensive data collection framework shall be required to guide how data will be managed and monitored. Moreover, a comprehensive database will be developed to serve as reference in the formulation and adoption of MEP across the different sectors.

The *Green Building Rating (GBR) System* was developed and enhanced through the partnership between the DOE and the Philippine Green Building Council (PGBC). This will ensure the use of efficient technologies and measures in building design such as the development of appropriate building measures for roofs and insulation to bring down heat from the atmosphere, thereby reducing demand for cooling. This system shall be promoted and implemented throughout the planning period.

Benchmarking and ratings for building information and reporting are also in the Roadmap. This involves the monitoring of energy consumption and collection of relevant data, which can be

useful in the formulation of new policy directions by the government to enhance energy efficiency measures.

3. Integration of EE&C at the Local Government Units

The DOE, in partnership with the Development Academy of the Philippines (DAP), aims to assist LGUs in integrating concrete EE&C programs, projects and supporting policies into their respective local development plans and their respective LEECP.

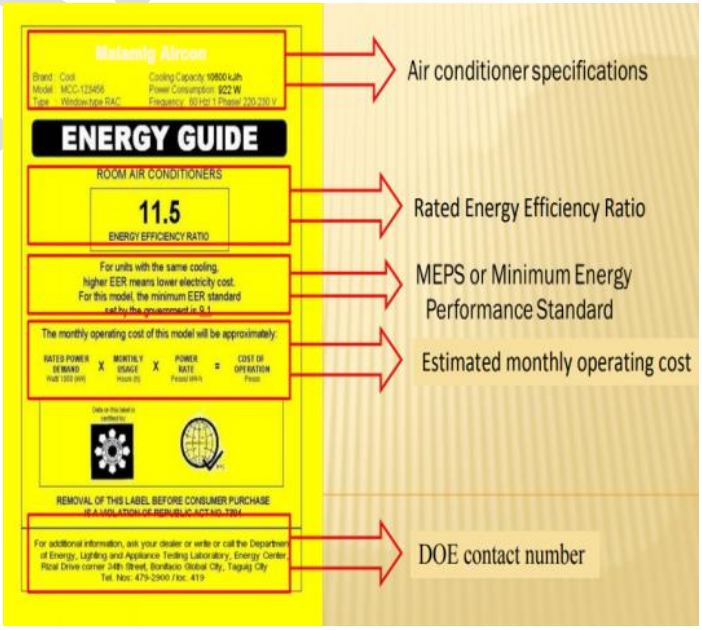
Mainstreaming Energy Efficiency and Conservation at the LGU Level

Its objectives are to: (1) promote mainstreaming of EE&C in all energy-demand sectors at the LGU level; (2) guide the LGUs in developing EE&C action plans and policies for implementation and integration into their local development plans; and (3) monitor and document best practices of LGU-related EE&C measures.

In 2018, the DOE conducted six (6) seminars on mainstreaming of EE&C at the LGU level in the cities of Cebu, Davao, Batangas, Baguio and Dumaguete.

4. Market Demand Scoping

The DOE's energy database system for determining market demand shall be strengthened to comply with the provision of the EE&C Act. Energy consumption data/information of energy-consuming sectors that were submitted to the DOE shall be used to establish a sectoral MEP. The EE&C Act strengthens the requirement of manufacturers, distributors, importers, and dealers of electrical appliances, and other energy consuming products to comply with the Philippine Energy Standard and Labeling Program (PESLP).



Prior to the signing of EE&C Act, the DOE in partnership with the European Union-Access to Sustainable Energy Program (EU-ASEP) conducted a forum in August 2018 on *"Directing the Compliance with PESLP"*. This served as the final presentation of the Implementing Guidelines of Department Circular (DC) 2016-04-0005 titled *"Declaring the*

Compliance of Importers, Manufacturers, Distributors, and Dealers of Electrical Appliances and other Energy-Consuming Products with the PESLP" among key stakeholders.

To ensure adherence to PESLP, continuous coordination and cooperation activities were carried out with private organizations such as the Energy Practitioners Association of the Philippines (ENPAP), Institute of Integrated Electrical Engineers (IIEE) of the Philippines, Cement Manufacturers' Association of the Philippines, Semiconductors and Electronics Industries of the Philippines, Inc., Chamber of Automotive Manufacturers of the Philippines, Association of Vehicles Importers and Distributors, Inc., and Certified/Accredited Energy Service Companies (ESCOs).

The Energy Standards Labeling Program is implemented by the DOE covering the following household appliances: *(1) window-type air-conditioning units* with cooling capacity up to 36,000 kilojoules per hour (kJ/h) and with mandatory MEP of 9.1 Energy Efficiency Ratio (EER) for units with cooling capacity below 12,000 kJ/h and 8.6 (EER) MEPS for 12,000 kJ/h and above; *(2) household refrigerators* ranging from 5 cu. ft to 8 cubic feet (cu ft.); *(3) Television sets* covering those with viewing screen size of 45 inches and below; and *(4) Lighting Products*, such as compact fluorescent lamp (CFL), linear fluorescent lamp (LFL), fluorescent circular lamp (FCL) and ballast) have MEPS and energy label requirements. For program expansion, the DOE conducted market characterization surveys for light-emitting diode (LED) lamps, electric fans and washing machines.

For the government sector, relevant data on the implementation of GEMP is obtained from the government entities, such as the national government agencies (NGAs), GOCCs, government financial institutions (GFIs), state universities and colleges (SUCs) and LGUs.

5. *Information, Education and Communication (IEC) Campaign on EE&C Practices through E-Power Mo*

One of government's crucial responsibilities is to promote energy awareness and disseminate useful information on energy efficiency measures and on recommended practices for all economic sectors. The **E-Power Mo** is the DOE's vehicle to empower energy consumers and inform the public on available options for a wiser and more intelligent use of energy. It summarizes the government's energy policy agenda on the following:

- *E-SAFETY* – Undertake safety and saving measures through energy efficiency;
- *E-SECURE* – Secure the delivery of quality, reliable and affordable energy services;
- *E-DISKARTE* – Empower consumers through a wide range of options in utilizing conventional and alternative energy sources.

Series of E-Power Mo campaigns

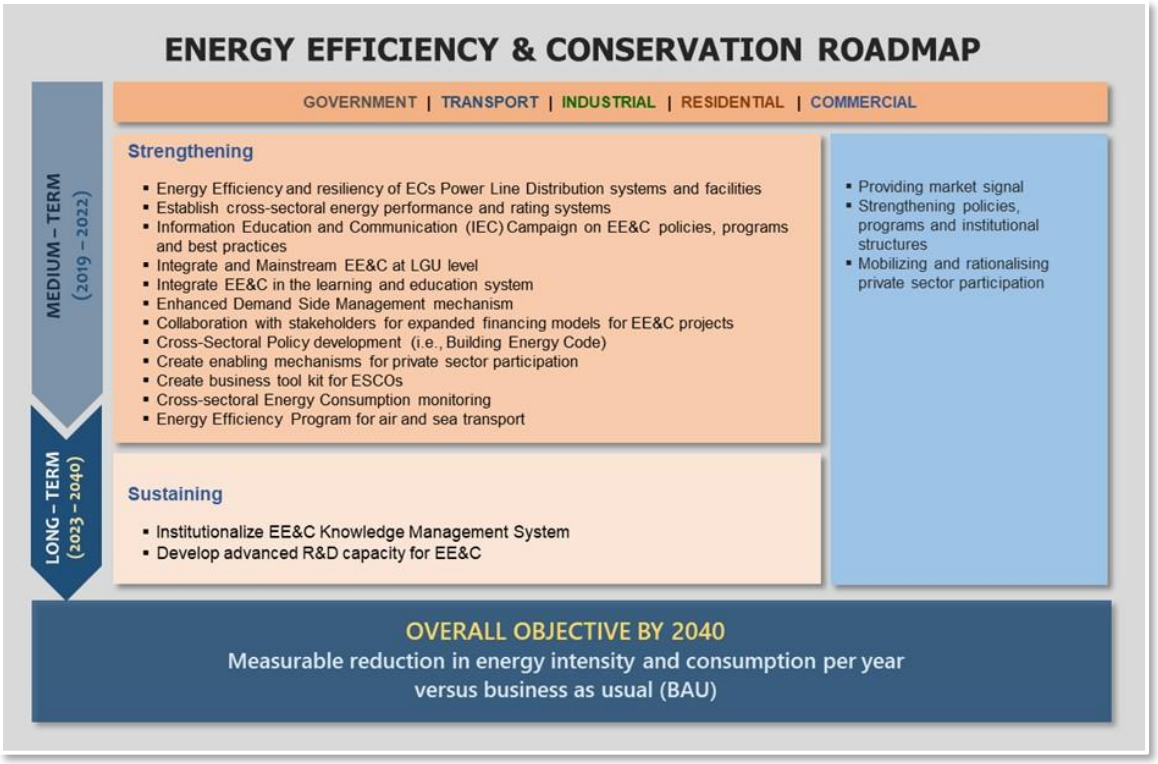
A total of 51 IEC events were conducted nationwide with the theme "*Energy Efficiency and Conservation*." IECs were also conducted in collaboration with DOE Bureaus: seven (7) E-Power Mo events in Pasay City, Cebu City, Davao City, Clark, Pampanga, Baguio City, Tagaytay City and Iloilo City and two (2) Energy 101 for media in Tagaytay City and Iloilo City. The DOE was able to educate various sectors of society to make them aware of the energy efficiency programs of government with the objective of managing energy supply and tempering the country's dependence on imported fuel sources.

B. PLANS AND PROGRAMS

The DOE seeks to reduce inefficient energy consumption in all sectors (including the government) in order to achieve a sustainable, secure, sufficient supply of energy and sustain modernization and development in the sector.

The Philippine *Energy Efficiency and Conservation Roadmap* provides the framework outlining the drivers and sectoral targets to be undertaken in support of the country's economic development goals through the efficient use of energy. The revised Roadmap for the planning period lines up priority initiatives and strategies of the government in the medium-to long-term, as shown in *Figure 82*, to achieve the overall objective of making EE&C a "*Way of Life*" for the Filipinos.

Figure 82. ENERGY EFFICIENCY & CONSERVATION ROADMAP



Medium-Term Strategy

1. Energy Efficiency and Resiliency of Electric Cooperatives' (ECs) Power Line Distribution Systems and Facilities

A detailed strategy setting out appropriate mechanisms on energy efficiency and resilience of the ECs' power line distribution systems and facilities shall be formulated. As most interruptions result from damages in the distribution system (caused by weather, accidents or aging equipment), power figure system's reliability and efficiency must be improved through enhanced strategies to improve resiliency against any events that can cause long duration outages. A baseline study shall be conducted on energy efficiency, reliability and resiliency of the system. The resiliency and modernization of distribution systems and facilities are critical in sustaining the use and consumption of energy by all economic sectors.

2. Cross-sectoral Energy Performance and Ratings

The EE&C Act provides a policy framework on the implementation of PESLP. With the approval of IRR of the EE&C Act, implementation of the PESLP (which used to be under the Department of Trade and Industry (DTI) as prescribed in the Consumer Act of 1992 (RA 7394) will now be transferred to the DOE. The Implementing Guidelines of PESLP should be promulgated six months after the issuance of the IRR to serve as the reference for all concerned government agencies and stakeholders on the scope and coverage of the program. The said Guidelines include administrative, general, technical and product requirements, among others. Its adoption supersedes DC 2016-04-005 providing the policy framework on the implementation of PESLP.

Aside from the mandatory energy efficiency and labeling system for energy-consuming products, such as room air conditioners, refrigeration units, television sets and lighting products, the Fuel Economy Performance Labeling requirements for transport vehicles will also be implemented covering all manufacturers, importers, distributors and dealers of vehicles in the country.,

3. Information, Education and Communication (IEC) Campaign on EE&C Policies, Programs and Best Practices

Dissemination of energy efficiency policies, programs, best practices and other initiatives shall be conducted regularly through the most effective channels such as the social media, mass media and localized events.

The *Roadmap* embodies action plans that will be widely communicated so that government objectives are made known, as well as enable its private partners recognize their roles and contributions towards the coordinated action on energy efficiency.

4. Integrate and Mainstream EE&C at LGU Level

The integration and mainstreaming of EE&C at the LGU level will be a continuing program within the planning horizon as stipulated in the EE&C Act. The LGUs (except barangays), through their respective Energy Efficiency and Conservation Officers (EECOs) and Planning Development Offices (PDOs), will have to develop and implement local EE&C plans to be incorporated in the local development plan.

Related activities include target monitoring and walk-through energy audits of selected LGUs per region. Monitoring of lighting, air conditioners and other equipment will also be conducted at the LGU level in partnership with DAP.

5. Integrate EE&C in the Learning and Education System

The DOE strengthened collaboration with the Department of Education (DepEd), Commission on Higher Education (CHED) and Technical Education and Skills Development (TESDA) for the inclusion of EE&C in the school curricula. Relatedly, several IEC's will be

designed for educational campaigns. Aside from these, other activities include teachers' training, and stronger linkage with the Environmental Education Program of the Department of Environment and Natural Resources (DENR).

6. *Enhanced Demand Side Management Mechanism*

Implementation of the Demand Side Management (DSM) Program, specifically for large energy consumers, is mandated under DC 2014-08-0014. This policy enjoins all electricity-consuming sectors to implement DSM programs and other conservation measures. In compliance with EE&C Act, the DSM will be strengthened and extensively applied over the planning horizon. Lower tariff rates could be imposed during off-peak hours, while higher rates will be given during peak hours to encourage less power usage during periods of high demand.

7. *Collaboration with Stakeholders for Expanded Financing Models of EE&C Projects*

The DOE will facilitate the execution and promotion of successful case studies that demonstrate the procurement of energy services and the financial model used especially in the industrial sector as part of capacity building efforts for ESCOs.

8. *Cross-Sectoral Policy Development (i.e., Building Energy Code)*

The development of a more energy-efficient commercial, industrial and transport sectors requires the support and participation of relevant stakeholders involved in developing policies that embody appropriate measures and effective strategies. For instance, sectoral policy development in the commercial and industrial sectors is necessary toward the effective transition to a more energy-efficient building infrastructure. Inclusion of efficiency measures in the National Building Code can create large-scale impact based on existing Guidelines for Energy Conserving Design of Buildings. This involves strong enforcement, collaboration and coordination in the policy making process.

9. *Smart Grid by 2040*

The DOE looks forward to its long-term vision of transitioning the energy sector into a smart grid by 2040. In addition to improving grid reliability, efficiency and resiliency, smart grid technologies will empower consumers allowing monitoring and management of energy consumption and promotion of new and emerging technologies (such as electric vehicles, net metering, smart monitoring equipment and appliances), as well as the development of smart homes and cities incorporating smart building technologies and home automation systems.

In 2015, MERALCO rolled out its Smart Meter Program starting with pre-paid meters within its franchise area. This allows customers to monitor their electricity consumption, allowing them to budget their consumption and expenses.

10. *Create Enabling Mechanisms for Private Sector Participation*

The DOE supports the realization of ***Ambisyon 2040*** and ***Dutertenomics*** in the country's quest to realize the "Golden Age of Infrastructure." It is a vision that will usher in global competitiveness by leveling up energy infrastructure development and promoting private sector participation. The DOE recognizes that for a secured energy future, government must provide the right environment for investments in energy infrastructures and efficient energy technologies.

Various policies (EVOSS, EO 30, ARTA) are now in place to reduce "red tape" and expedite business transactions in the public sector. And just recently, *Administrative Order (AO) 23* titled *"Eliminating Overregulation to Promote Efficiency of Government Processes"* was issued by the Office of the President to accelerate reforms in government processes so as to

remove overregulation (i.e. redundant or burdensome processes to the public) in the public sector. As stated in this AO, timelines in the processing of energy projects under the EVOSS Act shall be strictly complied with.

The adoption of these policies will provide a conducive environment for investments, as well as create enabling mechanisms for private sector participation. It is acknowledged that the private sector plays an important role in the attainment of business objectives, and in addressing the needs of the economy. Hence, an effective mechanism must be in place for private sector participation that would stimulate capital investments. Partnerships with the private sector through business organizations like the Association of the Chamber of Commerce and Industry will have a pivotal stake in the implementation of key initiatives of the government. Fora, where project financings are discussed, could also be another pertinent platform for dialogues and knowledge sharing for investment opportunities in EE&C related projects.

11. *Create the Business Toolkit for ESCOs*

The participation of the ESCO industry in the energy efficiency market is vital in accelerating the promotion of energy efficient technologies in large energy consuming industries (more than 4 million KWh per year). To further enhance ESCOs crucial participation in the energy sector's quest for energy efficient industries, a business tool kit shall be created and adopted by the DOE under the NEECP. Energy data of ESCOs will be compiled, including assessment of their performance to determine the implementation of best practices. The said information is required for submission to the DOE every three (3) years prior to their application for renewal of ESCO accreditation.

12. *Cross-sectoral Energy Consumption Monitoring*

A comprehensive data collection and management platform must be considered for the effective monitoring of activities, as well as to check on whether intended results or objectives are achieved. Likewise, an appropriate monitoring and evaluation system will have to be established whereby a data collection system is enhanced through improved indicators and reporting, as well as dissemination of performance results to stakeholders.

13. *Energy Efficiency Program in Air and Sea Transport*

The energy efficiency and conservation program toward an efficient air and sea transport system is an innovative initiative highlighted in the revised Roadmap.

Under the EE&C Act, the air and marine transport sectors are now required to submit reports to the DOE on their specific energy consumption, and other relevant details in order to establish a MEP specific to these sectors. The MEP for the transport sector will be introduced in a time-phased manner to keep pace with best practices internationally.

Long-Term Strategy

1. *Institutionalize a Knowledge Management System*

The institutionalization of EE&C Knowledge Management System is vital in ensuring sustainable management system. The DOE, in partnership with other local and international organizations, promotes sustainable energy management system (based on the ISO 50001 framework) and seeks to deploy EE&C best practices within the Philippine industrial setting.

The Philippine Industrial Energy Efficiency Project (PIEEP), a project jointly undertaken by the DOE and DTI, conducts building activities on energy management based *on ISO 50001: Energy Management System Standard Framework* for the industrial sector. This is done through system

optimization approach specifically on steam, compressed air, and pumping systems to improve industrial companies' energy efficiency levels, and provide awareness workshops and capacity building trainings for the country's manufacturing companies.

2. Develop the Advance Research and Development (R&D) Capacity

The conduct of R&D programs is vital for advancing energy-efficient technologies and practices in the country. For this, the DOE will continuously foster collaborative efforts to develop and update existing technologies through active participation to international fora and trainings related to R&D on EE&C.

C. INVESTMENT AND EMPLOYMENT OPPORTUNITIES

Initiatives to promote the efficient use of energy have the potential to bring about socio-economic benefits for the country. When investments are channeled to manage energy demand, businesses become more competitive which can then boost local employment. Likewise, production and manufacturing of energy efficient equipment and technologies are labor-intensive activities, thus creating more jobs for the labor market.

For the EE&C sector, the generation of investments and employment would focus on firms or businesses whose principal activity is the supply of energy efficient goods and services with the main goal of saving energy.

For one, the DOE's accreditation of ESCOs is one area that contributes to such initiative. ESCOs are businesses that deliver energy efficiency upgrades to include design, development, and financing of projects that save and reduce energy demand, as well as O&M costs of their customers' facilities. For 2018, the DOE has 26 accredited ESCOs which brought in an estimated investment of PhP ___, as well as employing ___personnel to implement their EE&C projects. In 2019, the DOE accredited additional seven ESCOs bringing the total to 33.

Implementation of RA 11285 during the planning horizon will broaden the window of opportunity that generates more investments and employment in the EEC sector.

For the commercial, industrial and transport sectors, the law provides the need to employ a Certified Energy Conservation Officers (CECO) for Type 1 Designated Establishments (annual energy consumption of 500,000 kWh to 4,000,000 kWh from the previous year), Certified Energy Managers (CEM)for Type 2 Designated Establishments (annual energy consumption of more than 4,000,000 kWh from the previous year) and Energy Auditors. Both the CECO and CEM may either be chosen from within the organization or through external recruitment.

The CECO Certification System will be developed by the DOE and TESDA, while the certification and assessment system of CEM shall be established by CHED. These certification systems shall be conducted by the DOE-accredited institutions through the conduct of training modules developed/approved by the DOE. Also, the services of technical training specialists will be required to implement the training modules.

For the national government agencies (NGAs, GOCCs, SUCs and the LGUs), the EE&C Act provides for the designation of the Energy Efficiency and Conservation Officers (EECO) for the implementation of the LEECP, and the identification of the Energy Efficiency and Conservation Focal Persons who may be selected from the existing personnel of the government agency or through the development of a new plantilla position.