PHILIPPINE ENERGY PLAN
2017-2040

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OIC, Energy Policy and Planning Bureau

Public Consultation on National Policy Review on Energy
27 October 2017
Sofitel Philippine Plaza Manila, Pasay City
Presentation Outline

- Policy Initiatives
- Energy Planning Process
- Energy Plan Outline
- PEP 2017 – 2040
Policy Initiatives
Strategic Directions 2017 – 2040

1. Ensure Energy Security
2. Expand Energy Access
3. Promote a Low Carbon Future
4. Strengthen Collaboration Among All Government Agencies Involved in Energy
5. Implement, Monitor and Integrate Sectoral and Technological Roadmaps and Action Plans
6. Advocate the Passage of the Department’s Legislative Agenda
7. Strengthen Consumer Welfare and Protection
8. Foster Stronger International Relations and Partnerships
### DOE’s Nine-Point Energy Agenda

<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS TO BASIC ELECTRICITY FOR ALL FILIPINOS BY 2022</td>
<td></td>
</tr>
<tr>
<td>ADOPTING A TECHNOLOGY NEUTRAL APPROACH FOR AN OPTIMAL ENERGY MIX</td>
<td></td>
</tr>
<tr>
<td>IMPROVING THE SUPPLY OF POWER THAT IS RELIABLE, TO MEET DEMAND NEEDS BY 2040</td>
<td></td>
</tr>
<tr>
<td>DEVELOPING LNG NEEDS FOR THE FUTURE IN ANTICIPATION OF THE MALAMPAYA DEPLETION</td>
<td></td>
</tr>
<tr>
<td>FACILITATING THE COMPLETION OF TRANSMISSION PROJECTS BY 2020</td>
<td></td>
</tr>
<tr>
<td>PRO-CONSUMER DISTRIBUTION FRAMEWORK FOR AFFORDABILITY, CHOICE AND TRANSPARENCY</td>
<td></td>
</tr>
<tr>
<td>STREAMLINING DOMESTIC POLICY TO CUT RED TAPE</td>
<td></td>
</tr>
<tr>
<td>DOE TO DELIVER ON PSALM PRIVATIZATION</td>
<td></td>
</tr>
<tr>
<td>PROMOTING EFFICIENT USE OF POWER AMONG CONSUMERS THROUGH AN IEC</td>
<td></td>
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</tbody>
</table>
Energy Planning Process
PEP 2017 – 2040

DOE Units
EPPB - lead
EPIMB, OIMB, EUMB, ERDB, REMB, ITMS, LS, ERTLS, CWPO, IPO, LFO, VFO, MFO, FS, AS

Attached Agencies
NPC, TransCo, PNOC, PSALM, NEA

Other Partners
NGCP, PEMC, NBB, NREB

1st Qtr
Plan Implementation Review

2nd Qtr
Public Consultations/Workshops

1st Qtr
Energy Plan Formulation

Sectoral Planning Workshop/Coordination Meetings

2nd Qtr
Revision of PEP draft

2nd Qtr
Presentation to Energy Family

3rd Qtr
Revision of PEP draft per ManCom’s comments

Finalization of PEP

3rd Qtr
Secretary’s Approval

Submission to OP and Congress

4th Qtr
PEP Launching & Implementation

4th Qtr
Printing of PEP for Publication

1st Qtr
Revision of PEP draft per ManCom’s comments

Public Consultations/Workshops

Energy Plan Formulation

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Plan Implementation Review

PEP Launching & Implementation

Printing of PEP for Publication
Energy Plan Outline
PEP 2017 – 2040

• Energy Supply and Demand Outlook
• Renewable Energy for a Clean Future
• Harnessing Conventional Fuels
• Promoting Emerging Energy Technologies
• Advocating Infrastructure Development in the Downstream Sector
• Powering the Nation
• Making Energy Efficiency a Way of Life
• Creating a Competitive Business Environment
**PEP 2017 – 2040**

**2016 Total Final Energy Demand by Fuel**

- **Oil**: 49.3%
- **Biomass**: 21.8%
- **Electricity**: 19.3%
- **Coal**: 8.1%
- **Biofuels**: 1.4%
- **Natural Gas**: 0.2%

**Total Final Energy Demand***: 33.12 MTOE

*Excludes non-energy used*
PEP 2017 – 2040

Energy Demand Outlook 2017 – 2040 (in MTOE)

By Fuel Type
- Petroleum Products
- Electricity
- Biomass
- Coal
- Natural Gas
- Biodiesel
- Ethanol

By Sector
- Transport
- Industry
- Residential
- Commercial
- AFF

Department of Energy
Empowering the Filipino
**2016 Total Primary Energy Supply**

**By Fuel**
- **RE** (Renewable Energy): 37.0%
- Oil-based: 34.9%
- Coal: 22.0%
- Natural Gas: 6.1%

**By Source**
- Indigenous: 55.3%
- Imported: 44.7%

### Energy Distribution

<table>
<thead>
<tr>
<th>Category</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Energy</td>
<td>53.19 MTOE</td>
</tr>
<tr>
<td>Self-Sufficiency</td>
<td>55.3%</td>
</tr>
<tr>
<td>Renewable Energy (RE)</td>
<td>37.0%</td>
</tr>
<tr>
<td>Clean Energy (RE + Nat Gas)</td>
<td>43.1%</td>
</tr>
</tbody>
</table>

**Imported Energy**

- Coal: 10.85
- Oil: 33.55
- Biofuels: 0.32
PEP 2017 – 2040

Total Primary Energy Supply, 2016 and 2040

2016 Actual
Total Energy: 53.2 MTOE

2040 Outlook
Total Energy: 137.8 MTOE

Oil 34.9%
Coal 22.0%
Natural Gas 6.1%
Hydro 3.8%
Geothermal 17.9%
Biomass 14.1%

Oil 35.4%
Coal 29.6%
Natural Gas 12.4%
Hydro 2.1%
Geothermal 8.5%
Biomass 8.9%

Other Technology 1.5%
Biofuels 1.3%
PEP 2017 – 2040
Fossil Fuels: Oil, Gas and Coal Production

- **Oil**
  - 201 MMB (down)
  - 2.41 MMB

- **Gas**
  - 140.52 BCF (up)
  - 122.54 BCF

- **Condensate**
  - 4.15 MMB (up)
  - 3.75 MMB

- **Coal**
  - 12.08 MMMT (up)
  - 7.38 MMMT
• 16 Sedimentary basins with a combined potential of 4,777 million barrels of fuel oil equivalent (MMBFOE)

• **24 Service Contract (SC)** holders are monitored and supervised

• Philippine Conventional Energy Contracting Program (PCECP)
PEP 2017 – 2040
Fossil Fuels: Coal

- Thirteen (13) coal basins with a total resource potential of 2.4 billion metric tons

- 78 active coal operating contract (COC) holders
  - 48 exploration
  - 30 development/production

- The PECR also includes coal in its offered areas
  - 15 new coal contracts in PECR 4 (2011)
  - 7 new coal contracts in PECR 5 (2014)
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>PETROLEUM RESERVES</strong></td>
<td><strong>PETROLEUM RESERVES</strong></td>
<td><strong>PETROLEUM RESERVES</strong></td>
</tr>
<tr>
<td>Assess oil reserves of 41.57 MMB oil, 3.36 TCF gas and 37.87 MMB condensate</td>
<td>Increase delineated oil from 42.79 MMB to 48.73 MMB, gas from 3.09 TCF to 4.67 TCF and condensate from 30.28 MMB to 47.24 MMB</td>
<td>Increase delineated oil from 48.73 MMB to 57.12 MMB, gas from 4.67 to 5.87 TCF, condensate from 47.24 MMB to 56.81 MMB</td>
</tr>
<tr>
<td>No new field discovery</td>
<td>Drill: 1 oil field (Calubian with 20 MMB) 2 fields (Sta. Monica 1 with 1.798 TCF and North Cliffhead with 0.42 TCF) 2 fields (Sta. Monica 1 with 30 MMB associated condensate)</td>
<td>Drill: 2 oil fields (Salamanca with 3.6 MMB and Popototan with 20 MMB) 2 gas field (Sta. Monica 2 with 1.2 TCF and RB-PO4 with 2.4 TCF) 2 fields (Sta. Monica 2 with 15 MMB and RB-P04 with 25 MMB associated condensate)</td>
</tr>
<tr>
<td>Produce: 2 oil fields (Galoc and Polyard A6 with 3.78 MMB 2 gas fields (Malampaya and Polyard A8 with 0.29 TCF 1 field (Malampaya with 7.59 MMB associated condensate)</td>
<td>Produce: 5 oil fields (Galoc, West Linapacan, Polyard A6, Cadlao and Octon with 16.56 MMB) 3 gas fields (Malampaya, San Martin and Polyard A8 with 0.645 TCF) 1 field (Malampaya with 13.04 MMB associated condensate)</td>
<td>Produce: 11 oil fields (Galoc, West Linapacan, Cadlao, Octon, Malampaya, Linapacan, Calauit, Malolos, Elephant, Calubian and Salamanca with 115.37 MMB 7 fields (Malampaya, San Martin, Sampaguita, Polyard A8, Mangosteen, Progreso and Sta. Monica 1 with 4.04 TCF) 4 fields (Malampaya, Sampaguita, Progreso and Sampaguita with 45.93 MMB associated condensate)</td>
</tr>
</tbody>
</table>

**OVERALL OBJECTIVE BY 2040**

**INCREASE INDIGENOUS PETROLEUM RESERVES TO 57.12 MMB OIL, 5.87 TCF GAS AND 56.81 MMB CONDENSATE AND PRODUCE 115.37 MMB OIL, 4.04 TCF GAS AND 45.93 MMB CONDENSATE TO CONTRIBUTE TO THE COUNTRY'S ENERGY REQUIREMENTS**
# UPSTREAM OIL AND GAS

## STRATEGIES

- Attract more investors to participate in the upstream petroleum exploration, development and production;
- Undertake Information, Education and Communication Campaigns to concerned/involved stakeholders/LGUs/local community about petroleum operations;
- Monitor compliance of SCs with work commitments and regulations relating to the exploration, development and production activities;
- Harmonize and integrate projects with other government agencies to ensure unified and coordinated efforts to ensure energy security;
- Formulate and implement policy issuances on upstream petroleum sector to streamline petroleum related activities of Service Contract Operators/Holders;
- Conduct and participate in resource assessment projects to update the current indigenous petroleum resources;
- Pursue international cooperation activities to keep abreast with the development in upstream petroleum industry, and;
- Undertake capacity building of human resources and upgrading of office and field equipment.

## OVERALL OBJECTIVE

**BY 2040**

**INCREASE INDIGENOUS PETROLEUM RESERVES TO 57.12 MMB OIL, 5.87 TCF GAS AND 56.81 MMB CONDENSATE AND PRODUCE 115.37 MMB OIL, 4.04 TCF GAS AND 45.93 MMB CONDENSATE TO CONTRIBUTE TO THE COUNTRY’S ENERGY REQUIREMENTS**
- Administer contract and monitor compliance of COC/SSCMP with work commitments and regulations relating to the exploration, development and production activities including health and safety in coal mines
- Administer coal trading, importation, exportation and coal end-user registration and implement DOE Circular No. DC2012-05-0006
- Conduct resource assessment projects and attract more investors to participate in the coal exploration, development and production
- Address unauthorized and informal coal resource development, production and trading activities
- Formulate, update and recommend policy issuances for adoption and implementation in the coal sector
- Pursue international cooperation activities on coal operation
- Undertake Information, Education and Communication (IEC) campaigns to relevant stakeholders to harmonize and integrate coal projects with other government agencies
- Render technical assistance to academe, LGUs, COCs and SSCMPs
- Undertake capacity building of human resources of office and field equipment
## PEP 2017 – 2040


<table>
<thead>
<tr>
<th>Technology</th>
<th>Installed Capacity (as of 2010)</th>
<th>Target Capacity Addition 2011-2020</th>
<th>Installed Capacity (as of 31 December 2016)</th>
<th>Potential Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Grid</td>
<td>Own-use</td>
<td>Total Installed</td>
</tr>
<tr>
<td>Geothermal</td>
<td>1,966.00</td>
<td>1,916.00</td>
<td>1,916.00</td>
<td>1,916.00</td>
</tr>
<tr>
<td>Hydro</td>
<td>3,400.00</td>
<td>3,618.00</td>
<td>3,618.00</td>
<td>3,618.00</td>
</tr>
<tr>
<td>Biomass</td>
<td>39.00</td>
<td>233.00</td>
<td>119.86</td>
<td>352.86</td>
</tr>
<tr>
<td>Wind</td>
<td>33.00</td>
<td>427.00</td>
<td></td>
<td>427.00</td>
</tr>
<tr>
<td>Solar</td>
<td>1.00</td>
<td>765.00</td>
<td>3.22</td>
<td>768.22</td>
</tr>
<tr>
<td>Ocean</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>5,439.00</td>
<td>6,959.00</td>
<td>123.08</td>
<td>7,082.08</td>
</tr>
</tbody>
</table>
### Renewable Energy: Awarded RE Projects (Dec 2016)

<table>
<thead>
<tr>
<th>Renewable Energy</th>
<th>Number of Awarded Projects</th>
<th>Potential Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grid</td>
<td>Own-Use</td>
</tr>
<tr>
<td>Hydropower</td>
<td>413</td>
<td>-</td>
</tr>
<tr>
<td>Ocean Energy</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>Geothermal</td>
<td>43</td>
<td>-</td>
</tr>
<tr>
<td>Wind</td>
<td>58</td>
<td>1</td>
</tr>
<tr>
<td>Solar</td>
<td>150</td>
<td>16</td>
</tr>
<tr>
<td>Biomass</td>
<td>45</td>
<td>22</td>
</tr>
<tr>
<td>SUB-TOTAL</td>
<td>716</td>
<td>39</td>
</tr>
<tr>
<td>TOTAL</td>
<td>755</td>
<td></td>
</tr>
<tr>
<td>Energy Source</td>
<td>Awarded Projects</td>
<td>Installed Capacity</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Hydropower</td>
<td>65</td>
<td>9.1 MW</td>
</tr>
<tr>
<td>Geothermal</td>
<td>2</td>
<td>12.0 MW</td>
</tr>
<tr>
<td>Wind</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Solar</td>
<td>48</td>
<td>600.2 MW</td>
</tr>
<tr>
<td>Biomass</td>
<td>9</td>
<td>-</td>
</tr>
<tr>
<td>Ocean</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Biofuels</td>
<td>21</td>
<td>-</td>
</tr>
</tbody>
</table>
### Renewable Energy: Biofuels Production

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production (in million liters)</td>
</tr>
<tr>
<td>Biodiesel</td>
<td>225.87</td>
</tr>
<tr>
<td>Bioethanol</td>
<td>230.18</td>
</tr>
<tr>
<td>TOTAL</td>
<td>456.05</td>
</tr>
</tbody>
</table>

- Biodiesel production and sales increased by 10.7 percent and 8.5 percent respectively in 2016.
- Bioethanol production and sales also increased by 37.1 percent and 34.7 percent in 2016.
<table>
<thead>
<tr>
<th>ACCELERATION OF RE POSITIONING</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Review and update 2011-2030 NREP</td>
</tr>
<tr>
<td>• Monitor and assess RESCs awarded for the conversion of indicative projects to committed</td>
</tr>
<tr>
<td>• Finalize rules and implement RPS and REM</td>
</tr>
<tr>
<td>• Finalize rules and implement Green Energy Option</td>
</tr>
<tr>
<td>• Conduct detailed RE technology and resource assessment</td>
</tr>
<tr>
<td>• Review other RE policy mechanisms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CREATION OF CONDUCIVE BUSINESS ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Streamline administrative processes of RESC applications</td>
</tr>
<tr>
<td>• To work on DOE energy projects to be declared as projects of national significance</td>
</tr>
<tr>
<td>• Enhance EVOSS for RE projects</td>
</tr>
<tr>
<td>• Provide technical assistance to lower investment cost</td>
</tr>
<tr>
<td>• Promote and incentivize local technology producers</td>
</tr>
<tr>
<td>• Establish RE Information Exchange</td>
</tr>
<tr>
<td>• Explore and initiate on the harmonization of LGU and national government related programs and policy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RELIABLE AND EFFICIENT INFRASTRUCTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Strengthen resiliency of RE systems and facilities</td>
</tr>
<tr>
<td>• Harmonize transmission Development Plan with RE targets</td>
</tr>
<tr>
<td>• Develop geographical installation target</td>
</tr>
<tr>
<td>• Enhance local technical capabilities</td>
</tr>
<tr>
<td>• Conduct R&amp;D on the efficiency of RE technologies on the Smart Grid System</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROMOTE AND ENHANCE RD&amp;D AGENDA</th>
</tr>
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<tbody>
<tr>
<td>• Strengthen the management and operation of ARECS</td>
</tr>
<tr>
<td>• Continue conduct of RE technology research and development studies</td>
</tr>
<tr>
<td>• Identify viability of new technologies</td>
</tr>
<tr>
<td>• Construct Ocean pilot/demo Energy projects</td>
</tr>
<tr>
<td>• Implement, monitor and evaluate pilot/demo projects for new RE technologies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identify parameters to determine the viable Ocean Energy tariff rate</td>
</tr>
<tr>
<td>• Continue technical capacity building on RE</td>
</tr>
<tr>
<td>• Conduct research and promote low-enthalpy geothermal areas for power generation and direct use/non-power application for development</td>
</tr>
<tr>
<td>• Harmonize the DOE related programs with agro-forestry policies for an integrated use of biomass</td>
</tr>
<tr>
<td>• Continue the conduct of IEC to attain social acceptability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERALL OBJECTIVE BY 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increase RE installed capacity to at least 20,000 MW</td>
</tr>
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<table>
<thead>
<tr>
<th>SHORT-TERM (2017-2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intensify development in off-grid areas for wider populace access to energy</td>
</tr>
<tr>
<td>• Determine realistic RE potential</td>
</tr>
<tr>
<td>• Update the NREP 2017 – 2040</td>
</tr>
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<table>
<thead>
<tr>
<th>MEDIUM-TERM (2019-2022)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Continue and accelerate implementation of RE projects</td>
</tr>
<tr>
<td>• Conduct regular updating of RE resource database</td>
</tr>
</tbody>
</table>
OVERALL OBJECTIVE
BY 2040

PURSUE THE DEVELOPMENT OF BIOFUELS IN COMPLIANCE WITH THE
BIOFUELS ACT OF 2006 (R.A. 9367)

SHORT-TERM
(2017-2019)

MEDIUM-TO LONG-TERM
(2020-2040)

BIOFUELS

BIOETHANOL

E10
Review the bioethanol mandate

B2
Maintain 2% biodiesel blending on diesel

• Revisit blending requirement and available feedstock
• Continuous conduct of research and development on feedstock sources
### PEP 2017 – 2040

**Downstream Oil Industry**

- 271 new players with total investments reaching PhP 56.35 Billion
- Formulated/Amended technical standards for fuel quality (CME and B5 specifications) and facilities (Code of Safety Practice in LPG Refilling Plant)
- Ensured availability of biofuels blend in compliance with the Biofuels Law
- Monitored and inspected facilities for compliance to quality and quantity standards:

<table>
<thead>
<tr>
<th>Facilities Inspected</th>
<th>Liquid Petroleum Products</th>
<th>LPG Establishments</th>
<th>Bulk Depots</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2016)</td>
<td>2,586</td>
<td>2,216</td>
<td>95</td>
</tr>
<tr>
<td>(1H 2017)</td>
<td>343</td>
<td>1,247</td>
<td>62</td>
</tr>
<tr>
<td>Total Facilities</td>
<td>6,804</td>
<td>15,000</td>
<td>163</td>
</tr>
</tbody>
</table>
• 0.9 percent increase in crude oil imports (from 78,060 MB in 2015 to 78,772 MB in 2016)

• The country has 285 thousand barrels per stream day (MBSD) as the current maximum working crude distillation capacity

• 12.9 percent increase in petroleum product imports (from 76,276 MB in 2015 to 86,108 MB in 2016)

• 1.5 percent decline in petroleum product exports (from 13,988 MB in 2015 to 13,771 MB in 2016)

• Continued enforcement of Minimum Inventory Requirement (MIR)
DOWNSTREAM OIL INDUSTRY

SHORT-TERM
(2017-2018)
- Update PNS for Euro IV
- Introduce application of modern emulsion
- Introduce higher biodiesel level (B5),

MEDIUM-TERM
(2019-2022)
- Limit Olefin & aromatic content and set additional composition controls
- Prohibit more metallic additives
- Introduce non-coconut biodiesel feedstocks,

LONG-TERM
(2023-2040)
- Reduce Benzene level content
- Introduce hydrolyzed fuel and higher bioethanol level (E20)
- Introduce ultra-low sulfur
- Develop low carbon fuel standard

FUEL QUALITY STANDARDS DEVELOPMENT

CONTINUING

LEGISLATIVE AGENDA AND POLICY ADVOCACY CAMPAIGN

FACILITY STANDARDS DEV’Ts

OVERALL OBJECTIVE BY 2040

IMPROVED POLICY GOVERNING THE DOWNSTREAM OIL INDUSTRY TO ENSURE CONTINUOUS SUPPLY OF HIGH QUALITY AND RIGHT QUANTITY OF PETROLEUM PRODUCTS IN THE MARKET

- Monitor the Downstream Oil Industry activities (i.e. supply/demand situation, price adjustments, inspections of new players facilities and stations offering discounts, etc.)
- Monitor/Assess oil price movements (international through MOPS) and ensure reasonableness of domestic price adjustments
- Conduct monitoring and enforcement activities (quantity & quality standards) at the bulk and retail levels
- Promote retail competition through the Gasoline Station Lending and Financial Assistance Program
- Process/issue certifications, permits, endorsements for DOI facilities/activities (retail and bulk)
- Conduct of nationwide Information, Education and Communication (IEC) campaigns
- Encourage investments in DOI
- Develop and implement DOI Capacity Building Programs
- Prepare for and implement ISO Accreditation on Quality Management System

- Review existing rules and regulations and recommend/implement amendments
- Update Oil Contingency Plan
- Improve process systems (e.g., on-line application, etc.)
- Advocate passage of LPG Bill
- Propose/Recommend Legislative Action for the Implementation of APSA, Stockpiling (through PNOC) and other ASEAN initiatives

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- Develop technical standards for bulk and retail downstream oil facilities
- Review/Update and ensure compliance to existing rules/regulations and technical standards

- Support/Implement ASEAN initiative (e.g. APSA, stockpiling)
- Facilitate establishment of Domestic “Strategic” Oil Stockpile Facility Standards

CONTINUING LEGISLATIVE AGENDA AND POLICY ADVOCACY CAMPAIGN

FACILITY STANDARDS DEV’Ts
## Natural Gas

<table>
<thead>
<tr>
<th>Natural Gas</th>
<th>Production and Consumption, in Million Standard Cubic Feet (MMSCF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production(^1)</td>
<td>1,666,685</td>
</tr>
<tr>
<td>Consumption(^2)</td>
<td>1,597,751</td>
</tr>
<tr>
<td>Power(^3)</td>
<td>1,568,673</td>
</tr>
<tr>
<td>Industrial</td>
<td>28,893</td>
</tr>
<tr>
<td>Transport</td>
<td>184</td>
</tr>
</tbody>
</table>

1. Data from 1994-2008 includes production from San Antonio gas field. Libertad gas field started its commercial production at 1400hrs, 03 February 2012.
2. Submission from gas users.
PEP 2017 – 2040

Downstream Natural Gas

• 9 inter-agency inspections for compliance on health, safety, security and environment

• PNS for Natural Gas Quality promulgated by the Bureau of Philippine Standards on 20 June 2016

• 24 IECs to academe, government and non-government organizations, industries and legislators

• Establishment of coalition between government and energy stakeholders for energy policy roadmap

• Permit extension for Shell refinery’s 0.8km pipeline from onshore gas processing plant
### Table 26. PROPOSED NATURAL GAS INFRASTRUCTURE PROJECTS

<table>
<thead>
<tr>
<th>Target Operation</th>
<th>Project</th>
<th>Proponent</th>
<th>Location</th>
<th>Capacity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2018 for 1 storage tank and initial 400 MW gas plant</strong></td>
<td>LNG Import Receiving/Hub Terminal</td>
<td>Energy World Corp. Ltd. (EWCL)</td>
<td>Brgy. Ibabang Polo, Grande Island, Pagbilao Quezon</td>
<td>2 x 130,000 cu.m. LNG storage tanks 600 MW gas fired plant anchor market</td>
<td>Granted Provisional Permit for 5 years Provisional permit expires in Jan 2016 DOE issued 12 month extension of the Permit Completed FS Study</td>
</tr>
<tr>
<td><strong>2018</strong></td>
<td>Floating Storage Unit Submerged Regasification Unit</td>
<td>VIRES Energy</td>
<td>Simlong, Batangas</td>
<td>Floating Power Plant (1x400 MW)</td>
<td></td>
</tr>
<tr>
<td><strong>2022</strong></td>
<td>LNG Floating Storage and Regasification Unit (FSRU)</td>
<td>Shell Gas and Energy Philippines</td>
<td>Pilipinas Shell Petroleum Corporation’s (PSPC’s) Refinery area at Batangas Bay, Tabangao, Batangas</td>
<td>170,000 cu m, Initial 450MW gas fired plant anchor market</td>
<td>Completed the FS of the LNG Facility &amp; Front End Engineering Design (FEED). Public consultation on Environmental Impact Statement (EIS)</td>
</tr>
<tr>
<td><strong>2019 for Phase 1: 1.0-1.4 MTPA or 1,414 MW</strong></td>
<td>Floating Storage and regasification unit (FSRU)</td>
<td>First Gen</td>
<td>San Gabriel, Batangas</td>
<td>1.0-1.4 MTPA or 1,414 MW (Phase 1) 3.6-5.0 MTPA (Phase 2)</td>
<td>Completed feasibility study and FEED of the LNG facility Filed its Permit application to the DOE</td>
</tr>
<tr>
<td><strong>Phase 1: 2018</strong></td>
<td>Energy City LNG</td>
<td>Araneta Group of Companies</td>
<td>Philippine National Oil Company-Alternative Fuel Corporation (PNOC-AFC) compound in Mariveles and Limay, Bataan</td>
<td>1x180,000 cu.m onshore tank 1,600 MW gas fired plant anchor market</td>
<td>Completed the pre-FS of the LNG Facility. Issued ECC for the LNG project. Financing activities ongoing; Equity partnership discussion ongoing</td>
</tr>
<tr>
<td><strong>Phase 2: 2021</strong></td>
<td>Petroleum Brunei &amp; Brunei LNG</td>
<td>Petroleum Brunei and Brunei and LNG</td>
<td>Tagoloan, Misamis Oriental in Mindanao.</td>
<td>163 cu m/hr of LNG 500 MW CCGT anchor market</td>
<td>Completed FS study for the location of the onshore power plant</td>
</tr>
<tr>
<td><strong>2020</strong></td>
<td>Batangas-Manila Pipeline</td>
<td>Philippine National Oil Company</td>
<td>Batangas-Navotas</td>
<td>A 121 km high-pressure gas transmission pipeline that will service the converted Sucat thermal plant; ecozones and industries along the route</td>
<td>Completed detailed feasibility study and market study Approval of the Batman Project by the Joint Cabinet-Investment Coordinating Council</td>
</tr>
</tbody>
</table>
## Downstream Natural Gas

### Overall Objective by 2040

- To establish a world-class, investment-driven and efficient natural gas industry that makes natural gas the preferred fuel by all end-use sectors.

### Short-Term (2017-2018)
- Monitor the sale of remaining volume of PNOC banked gas field
- Monitor the development of the upstream activities (e.g. awarding, drilling and testing and commercial production)
- Monitor and coordinate with Energy World Corp. to meet its timeline to import LNG with one storage tank or FSU
- Evaluate impact of dependency on imported natural gas/LNG

### Medium-Term (2019-2022)
- Continue monitoring the development of the upstream activities
- Monitor additional projected LNG imports in Quezon and Batangas
- Monitor new and emerging technologies in LNG storage and transport
- Monitor the consumption of LNG in off-grid islands

### Long-Term (2023-2040)
- Continue monitoring the activities of the upstream developments including drilling of Malampaya East
- Continue monitoring the consumption of LNG in off-grid islands
- Monitor additional LNG imports

### Expand Supply Source
- Monitor the progress of the implementation of IFC to conduct study on the viability of a satellite terminals in off-grid islands
- Coordinate and monitor with proponents the development of natural gas infrastructure projects (e.g. EWC, PNOC-EC and PNOC Mother)
- Update the Natural Gas Infrastructure Program

### Infrastructure Dev’t
- Advocate the passage of the Magna Carta Bill for Energy Workers
- Draft the proposed Natural Gas Bill
- Draft guidelines/regulations to address LNG importation
- Draft DC on rules to implement the PNS on Natural Gas Quality
- Update the Natural Gas Framework

### Policy Dev’t
- Continue monitoring the development of the upstream activities
- Monitor additional projected LNG imports in Quezon and Batangas
- Monitor new and emerging technologies in LNG storage and transport
- Monitor the consumption of LNG in off-grid islands

### Policy Dev’t
- Advocate the passage of Natural Gas Bill
- Develop and implement standards on transmission and distribution pipeline and LNG facilities and related ancillary facilities

### Policy Dev’t
- Prepare and implement the IRR for the Natural Gas Law
- Develop standard and adapt emerging technologies related to the transportation and storage of natural gas
- Continuing updating of PNS on natural gas facilities
### Downstream Natural Gas

#### Short-Term (2017-2018)
- Monitor the consumption of existing natural gas power plants
- Prepare gas situationer reports on market trends, pricing and supply/demand
- Conduct IECs to promote the use of natural gas
- Promote the resumption on use of CNG vehicles in coordination with EUMB
- Continue the conduct of market profiling survey
- Conduct IECs to promote the use of natural gas
- Conduct the inventory of natural gas technology for non-power applications
- Establish an inter-agency health, safety, security and environment monitoring and inspection team for the existing and emerging natural gas facilities
- Identify training programs and funding support for the regulators of the industry

#### Medium-Term (2019-2022)
- Continue the monitoring of new and existing natural gas power plants
- Monitor the consumption of natural gas use in transport and industry
- Promote the use of LNG in cold storage and Adsorbed Natural Gas (ANG) in tricycles
- Establish bilateral partnership with academe, international organization/institute and industries to map out technical, legal/regulatory and commercial capabilities
- Identify exchange program/on-the-job training for actual exposure of identified key regulatory to develop the long term skills program for natural gas

#### Long-Term (2023-2040)
- Continue the monitoring of new and existing natural gas power plants
- Espouse the commissioning of additional natural gas-based power plants
- Monitor the consumption of natural gas from additional ecozones
- Promote the use of CNG in fishing boats and inter-island passengers marine vessels
- Promote the use of CNG in provincial buses as well as in commercial and residential sectors
- Advocate the establishment of Energy Institute
- Support exchange program or on-the-job training for actual exposure of identified key regulatory to develop the long term skills program for natural gas

#### Overall Objective by 2040
To establish a world-class, investment driven and efficient natural gas industry that makes natural gas the preferred fuel by all end-use sectors.
PEP 2017 – 2040
1H 2017 Power Capacity and Gross Generation

**Total Installed Capacity:** 21,621 MW
**Renewable Energy Share:** 32.5%

**Gross Generation:** 44,649 GWh
**Renewable Energy:** 27.6%
**RE + Nat Gas:** 48.5%
### PEP 2017 – 2040

**Power Development: Grid System**

**Load**
- Residential: 33%
- Commercial: 34%
- Industrial: 29%
- Others: 4%

2016 Electricity Sales: 74,154 GWh

**Transmission**
- 31,501 MVA
- 20,053 ckt-km

**Distribution**
- 23 PIOUs
- 100 ECs
- 2 LGUOUs

**Generation**
- 199 GenCos
- 21.42 GW Installed Capacity
- 90,798 GWh Gross Generation

**Gross Generation by Source**
- Coal: 48%
- Nat Gas: 22%
- RE: 24%
- Oil-based: 6%

Peak Demand: 13.272 GW

PIOUs - Private-Investor Owned Utilities
ECs - Electric Cooperatives
LGUOUs - LGU-Owned Utilities

Sources of Data: DOE; NGCP
PEP 2017 – 2040
Power Development: Off-grid System

Load

- Residential: 8%
- Commercial: 24%
- Industrial: 24%
- Others: 56%

1,020.1 GWh
2015 Electricity Sales

64.3%* Energized

Generation

- NPC: 291
- Non-NPC: 30

406.1 MW Total Installed Capacity

Transmission

- 170 MVA
- 770 ckt-km

Distribution

- 21 ECs
- 2 MPCs
- 3 LGUOUs
- 1 QTP

Energized Houses: 64.3%*

*excluding ARMM areas

Source of Data: DOE; NPC
Household electrification level reached 90.7 percent in December 2016.
Philippines will need 43,765 MW additional capacity by 2040.
### POWER SECTOR

<table>
<thead>
<tr>
<th>OVERALL OBJECTIVE BY 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENSURE QUALITY, RELIABLE, AFFORDABLE AND SECURE SUPPLY</td>
</tr>
<tr>
<td>EXPAND ACCESS TO ELECTRICITY</td>
</tr>
<tr>
<td>ENSURE A TRANSPARENT AND FAIR PLAYING FIELD IN THE POWER INDUSTRY</td>
</tr>
</tbody>
</table>

####SHORT-TERM (2017-2018)

- Facilitate the declaration of Power Projects as Project of National Significance
  - Exemption from Real Property Tax and Local Taxes
  - Express grant of business permit and licenses to operate
- Institute power mix policy for power generation towards optimal* portfolio to meet 24/7 electricity demand and reserve requirements with spatial and sectoral dimension

####MEDIUM-TERM (2019-2022)

- Pursue the entry of new and emerging technologies for power generation (e.g. ocean, fuel cells, nuclear, etc.) consistent with the power mix policy.

####LONG-TERM (2023-2040)

- Lead in the Plant Performance Assessment/Benchmarking in order to review and develop policies to improve power generation
- Encourage Compliance to International Standards for constructing Power Plants and accreditation of contractors
- Review and develop power generation related policies
- Develop resiliency policies for generating assets
- Conduct daily monitoring of power situation
- Periodic monitoring of power generation projects
- Provision of technical support
- Promote investments in power generation

* Required Baseload, Mid-Merit and Peaking Capacity at least Cost
## POWER SECTOR

### OVERALL OBJECTIVE BY 2040

- Ensure quality, reliable, affordable and secure supply
- Expand access to electricity
- Ensure a transparent and fair playing field in the power industry

### TRANSMISSION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Facilitate timely completion of transmission projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Enhance rules and procedures in the conduct of Transmission System Impact Studies (SIS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Provide guide for investors in power generation siting through enhance and responsive Transmission Development Plans (TDP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Facilitate interconnection of the three major grids – Luzon, Visayas, and Mindanao (Leyte-Mindanao Interconnection Project) and interconnect in the main grids, emergent Island-grids (e.g. Mindoro)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Develop policies towards adequate contracted capacities for reserves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Lead in the transmission Performance Assessment/Benchmarking in order to review and develop policies to improve transmission</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Monitor interconnection schedule of the Visayas and Mindanao Grids by 2020 and other islands.

<table>
<thead>
<tr>
<th>TRANSMISSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Monitor compliance with the TDP</td>
</tr>
<tr>
<td>- Continue implement transmission system upgrades and expansion program (compliance to N-1, Contingency and Load Growth)</td>
</tr>
<tr>
<td>- Increase transmission backbones and alternative transmission corridors</td>
</tr>
<tr>
<td>- Interconnect Mindoro Island to Luzon grid</td>
</tr>
<tr>
<td>- Develop resiliency policies for transmission facilities</td>
</tr>
</tbody>
</table>

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
POWER SECTOR

SHORT-TERM (2017-2018)

• Facilitate timely implementation of necessary Distribution Facilities
• Enhance Distribution Development Plan (DDP) towards operational and institutional efficiency
• Facilitate economies of scale in the Distribution Utilities’ Operation
• Provide policy and regulatory support to new and emerging needs of the consumers
• Improve transparency mechanism in rates and charges
• Ensure adequate power supply contracts and reserves to serve Captive Market through open and competitive processes
• Enhance power supply contracts to include among others replacement power and penalty provisions
• Performance Assessment/Benchmarking
• Process Direct Connection Application
• Develop and monitor accountability of DUs
• Continue to implement distribution line upgrades and expansion programs for better services at the least cost to consumers
• Continue improvement in operational efficiency and good governance in the operations and management of Distribution Utilities
• Develop resiliency policies for distribution facilities

MEDIUM-TERM (2019-2022)

• Formulate Supply Development Plan for integration in the PDP
• Develop policies to facilitate:
  • Mandatory Contestability for 1 MW and up electricity end-users
  • Full open access for 750 KW and above Contestable Customers
  • Retail aggregation for minimum of 750 kW aggregated demand
  • Conduct Market Studies for lowering Contestability to 500 kW
• Increase transparency in the retail supply contracting.
• Develop policies on the implementation of RCOA in Mindanao by 2018

LONG-TERM (2023-2040)

• Develop policies to facilitate:
  • Open access for 500 KW and below
  • Retail aggregation for minimum aggregated demand of 500 kW

OVERALL OBJECTIVE BY 2040

ENSURE QUALITY, RELIABLE, AFFORDABLE AND SECURE SUPPLY
EXPAND ACCESS TO ELECTRICITY
ENSURE A TRANSPARENT AND FAIR PLAYING FIELD IN THE POWER INDUSTRY

DISTRIBUTION

SUPPLY
POWER SECTOR

SHORT-TERM
(2017-2018)

Develop policies and monitor compliance on:
• WESM Design Improvements/NMMS
• Appoint Independent Market Operator (IMO)
• Privatization of NPC assets
• policy for Embedded Generators
• Establishment of Mindanao Electricity Market
• Develop Roadmap, Policy Utilization for Smart Grid and other technologies
• Renewable Energy Market (in line with RPS implementation)
• Reserve/Energy Market Co-optimization
• Demand Bidding in the WESM
• Forwards Market/Financial Transmission Rights/Day-ahead market/Derivatives Market

MEDIUM-TERM
(2019-2022)

• Intensify Information, Education and Communication (IEC) Campaign
• Conduct periodic Market Operations Audit and Metering Service Provider Review
• Conduct WESM Rules, Market Manual and Retail Rules Review
• Establish and maintain DOE Electric Power Database Management System
• Monitor Market Operator Performance and conduct review of Standards
• Monitor compliance to WESM Rules
• Prepare and submit semi-annual EPIRA Status Report to JCPC
• Monitor and evaluate EPIRA implementation
• Assist and monitor ECs institutional strengthening program
• Support to enhance power generation planning through procurement of generation planning software and transmission planning tools

LONG-TERM
(2023-2040)

• Continue policy development to enhance Electricity Market

OVERALL OBJECTIVE BY 2040
ENSURE QUALITY, RELIABLE, AFFORDABLE AND SECURE SUPPLY
EXPAND ACCESS TO ELECTRICITY
ENSURE A TRANSPARENT AND FAIR PLAYING FIELD IN THE POWER INDUSTRY

MARKET DEVELOPMENT

INSTITUTIONAL AND SUPPORT MECHANISM
POWER SECTOR

OVERALL OBJECTIVE
BY 2040

SHORT-TERM
(2017-2018)

• Conduct policy studies on optimal energy mix for off-grid areas
• Rationalize and improve UCME Subsidy System
• Develop resiliency policies for off-grid facilities
• Strengthen institutional cooperation (DOE, NEA and NPC) to ensure transparent and effective CSP and mutually beneficial supply contracts for ECs
• Determine new areas for electrification as well as eco-zones for private investment purposes
• Performance Assessment and benchmarking
• Develop graduation policy from UCME

MEDIUM-TERM
(2019-2022)

• Develop and maintain Missionary Electrification Database System
• Promote the integration of other economic incentives in missionary electrification
• Capacitate DUs to improve power supply contracting in off-grid areas
• Monitor and enhance the implementation of the privatization of remaining NPC-SPUG generating assets
• Monitor compliance to Philippine Small Grid Guidelines
• Expand services and Improve operations of Electric Cooperatives for increased efficiency and reduction of losses

LONG-TERM
(2023-2040)

MISSIONARY ELECTRIFICATION

• Ensure quality, reliable, affordable and secure supply
• Expand access to electricity
• Ensure a transparent and fair playing field in the power industry

OBJECTIVES:  
- Overall Objective
- Short-term (2017-2018)
- Medium-term (2019-2022)
- Long-term (2023-2040)

- Conduct policy studies on optimal energy mix for off-grid areas
- Rationalize and improve UCME Subsidy System
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- Ensure quality, reliable, affordable and secure supply
- Expand access to electricity
- Ensure a transparent and fair playing field in the power industry
### POWER SECTOR

#### OVERALL OBJECTIVE BY 2040

#### TOTAL ELECTRICITY ACCESS IN THE COUNTRY

|------|------------------------|-------------------------|----------------------|
|      | • Process, evaluate and approve projects that contribute to the attainment of 90% household electrification by 2017 (based on 2010 Census)  
  ➢ NIHE  
  ➢ ER 1-94  
  ➢ PV Mainstreaming  
  ➢ ASEP  
  ➢ QTP  
  ➢ Monitoring of HEDP program  
  ➢ REMB HEP using RE  
  ➢ NEA BLEP and SEP  
  ➢ NPC Electrification efforts  
  • Establish off-grid Database Management System (Baseline)  
  • Develop proposal for NIHE Phase 2 | • Process, evaluate and approve projects that contribute to the attainment of 100% electrification of targeted and identified households by 2022 accessible to grid (based on 2015 census)  
  ➢ ER 1-94  
  ➢ NIHE (Phase 2)  
  ➢ PV Mainstreaming (under ASEP)  
  ➢ QTP  
  • Monitoring of HEDP programs  
  ➢ REMB HEP using RE  
  ➢ NEA BLEP and SEP  
  ➢ NPC Electrification efforts | • Electrification of all targeted and identified households (households identified beyond 2015 Census)  
  • 100% household electrification of all off-grid areas |
|      |                        |                         |                      |
|      | • Process, evaluate and approve projects that contribute to the attainment of rural electrification  
  ➢ ER 1-94 (electrification and support projects under DLF and RWMHEEF)  
  ➢ PV Mainstreaming under ER 1-94  
  ➢ QTP | | |
PEP 2017 – 2040
Alternative Fuels and Energy Technologies

Promotion of Alternative Fuel Vehicles
1. Conducted ten (10) IEC Events
2. Creation of an Inter-Agency Auto-LPG Technical Working Group
3. Partnership with SUCs for skills development of Auto-LPG technicians
4. Promotion of next-generation vehicles through the implementation of the Non-Project Grant Aid of Japan

Formulation of policies
1. Joint Budget Circular for implementation of Sec. 36 of 2017 GAA
2. Creation of a TWG for the integration of EV Charging Station with the existing Liquid Fuel Refilling Station
3. Inclusion of AFVs in the IPP of DTI-BOI
4. Update of PNS 05:1983 – Code of Practice for the use of LPG in internal combustion engines

Emerging Indigenous Energy Technologies
1. Technology Evaluation for Locally Proposed Energy Technologies
2. Partnership with Central Mindanao University to conduct study on the use of grass-based fuel for domestic cooking
3. Partnership with Isabela State University for prototyping of LPG-fueled farm equipment

Continuing Promotion of Alternative Fuel Vehicles and Energy Technologies
### Overall Objective by 2040

**Ensure secured and stable supply of energy through technology responsive energy sector**

### Short-Term (2017-2018)

**Identification of alternative fuels and technologies (AFET) for application**

- Advocate for the passage of legislation on the use of AFET
- Mobilize funds from grants
- Harmonize policies of concerned National Government Agencies on AFET
- Scale up the ecotown concept to include the use of AFET
- Identify other emerging efficient technologies for non-transport applications

### Medium-Term (2019-2022)

**Preparation of the regulatory and infrastructure requirements of the identified AFET**

- Review, update, formulate energy-related policies, guidelines and standards
- Scale up the use of AFET
- Pursue the use of sustainable energy efficient technologies
- Collaborate with the stakeholders

### Long-Term (2023-2040)

**AF vehicles mainstreamed in the transport sector**

- Deploy applicable AFET for transport and non-transport purposes
- Collaborate with private sectors, LGUs, investors, funders, entrepreneurs, transport groups and academe

#### Identification of alternative fuels and technologies (AFET) for application

- (1) Electric vehicle
- (2) LPG
- (3) CNG
- (4) LNG
- (5) Hybrid electric vehicle

**Assessment of non-transport energy technologies will be pursued**

### Continuous assessment of emerging AFET

- Continuous conduct of relevant policy studies on emerging AFET
- Continuous conduct of IEC on benefits of AFET to engage the stakeholders

*AFET being prioritized are (1) electric vehicle; (2) LPG; (3) CNG; (4) LNG; (5) hybrid electric vehicle*
• **Government Energy Management Program (GEMP)**
  - Issued 20 Certificates of Energy Savings
  - Conducted energy audits in 45 government agencies and 2 commercial/industrial establishments
  - Deferred capacity from energy savings reached 2,547 MW (2015-2016)

• **Don Emilio Abello Energy Efficiency Awards**
  - Awarded 456 companies from 2010 to 2016 for reported generated savings of 1,280,089,210.73 kWh

• **Policy Development**
  - Directing compliance of commercial, industrial and transport establishments with the Philippine Minimum Energy Performance Program as policy of Government (2017)
**ENERGY EFFICIENCY & CONSERVATION**

**OVERALL OBJECTIVE BY 2040**

**SHORT-TERM** *(2017-2019)*

**INDUSTRY DEVELOPMENT**
- Conduct market demand scoping
- Advocate the legislation of the EE&C bill
- Establish cross-sectoral energy performance and rating systems
- Create business tool kit for ESCOs
- Collaboration with stakeholders for expanded financing models for EE&C Projects
- Information, Education and Communication (IEC) campaign on EE practices
- Integrate EE&C at LGU level

**STRENGTHENING**
- Create enabling mechanisms for private sector participation
- Enhance Demand Side Management mechanisms
- Integrate EE&C in the learning and education system
- Mainstream EE&C at LGU level

**SUSTAINING**
- Institutionalize EE&C Knowledge Management System
- Develop advanced EE&C R&D capacity

**Government**
**Transport**
**Industrial**
**Residential**
**Commercial**

**Providing market signals**
**Strengthening policies, programs and institutional structures**
**Mobilizing and rationalizing private sector participation**

**MEASURABLE REDUCTION IN ENERGY INTENSITY AND CONSUMPTION PER YEAR VERSUS BUSINESS AS USUAL (BAU)**

**ENERGY EFFICIENCY & CONSERVATION**

**OVERALL OBJECTIVE BY 2040**

**SHORT-TERM** *(2017-2019)*

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**Government**
**Transport**
**Industrial**
**Residential**
**Commercial**

**Providing market signals**
**Strengthening policies, programs and institutional structures**
**Mobilizing and rationalizing private sector participation**
Thank You!

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