PHILIPPINES’ ENERGY STATISTICS AND CURRENT ENERGY SITUATION

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Outline of Presentation

1. Energy Supply and Demand
   - Reference Energy System
   - Data Collection
   - Energy Balance Table
   - Outlook Process Flow & Methodology

2. Current Energy Situation

3. Strategic Directions
ENERGY SUPPLY AND DEMAND
As for coal, coal reserves as of Dec 2015:

- Positive Reserves: 297,974,425
- Resource Potential: 2,386,700,000
Data Collection

**PRIMARY SOURCES**
- Oil Industry Participants/Players
- End-Users Directly Importing Oil (e.g. Airline Companies, Mining & Fishing Companies)
- International Wire Services (e.g. Mean of Platts Singapore)
- Natural Gas Industry

- Oil & Gas Fields (e.g. Malampaya Gas Field, Galoc Oil Field)
- Cement Industry (e.g. Republic Cement, Taiheiyo Cement)
- Coal Power Industry (e.g. Toledo Power Corp, Sual Power Corp.)
- Local Coal Producers (e.g. Semirara Coal Corp.)

- Power Generating Companies
- Distribution Utilities (e.g., RECs, PUs)
- National Power Corporation
- National Transmission Corporation
- National Grid Corporation of the Philippines

- RE Companies and Facilities (e.g. San Carlos Bioenergy Inc., Leyte Agri Corporation)
- Affiliated Renewable Energy Centers (ARECs former ANECs)
- Other Energy Companies (e.g. PNOC-EDC)
- Other Government Agencies (e.g. NIA, PAG-ASA)

**DOE BUREAUS**
- Oil Industry Management Bureau (OIMB)
- Energy Resource Development Bureau (ERDB)
- Electric Power Industry Management Bureau (EPIMB)
- Renewable Energy Management Bureau (REMB)

**OTHER SOURCES**
- Department of Transportation (DOTr)
- Philippine Statistics Authority (PSA)

**Energy Policy & Planning Bureau (EPPB)**

**Energy Balance Table**
2016 Energy Balance Table (EBT), in KTOE

<table>
<thead>
<tr>
<th>Source of Energy</th>
<th>Coal</th>
<th>Natural Gas</th>
<th>Oil &amp; Oil Products</th>
<th>Hydro</th>
<th>Geothermal</th>
<th>Solar</th>
<th>Wind</th>
<th>Biomass</th>
<th>Biodiesel</th>
<th>Bioethanol</th>
<th>Electricity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous</td>
<td>5,917</td>
<td>3,270</td>
<td>702</td>
<td>2,019</td>
<td>9,519</td>
<td>94</td>
<td>84</td>
<td>7,494</td>
<td>178</td>
<td>127</td>
<td>-</td>
<td>29,405</td>
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<tr>
<td>Imports (+)</td>
<td>10,572</td>
<td>-</td>
<td>21,454</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>145</td>
<td>-</td>
<td>32,171</td>
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<tr>
<td>Exports (-)</td>
<td>(3,607)</td>
<td>-</td>
<td>(1,919)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(5,526)</td>
</tr>
<tr>
<td>International Marine Bunkers (-)</td>
<td>-</td>
<td>-</td>
<td>(50)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(50)</td>
</tr>
<tr>
<td>International Civil Aviation (-)</td>
<td>-</td>
<td>-</td>
<td>(1,296)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Stock Change (+/-)</td>
<td>(1,196)</td>
<td>-</td>
<td>(345)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(10)</td>
<td>37</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Primary Energy Supply</strong></td>
<td>11,686</td>
<td>3,270</td>
<td>18,547</td>
<td>2,019</td>
<td>9,519</td>
<td>94</td>
<td>84</td>
<td>7,494</td>
<td>168</td>
<td>309</td>
<td>-</td>
<td>53,189</td>
</tr>
<tr>
<td>Refinery (Crude Run)</td>
<td>-</td>
<td>-</td>
<td>(556)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(556)</td>
</tr>
<tr>
<td>Power Generation (Fuel Input)</td>
<td>(10,232)</td>
<td>(3,082)</td>
<td>(1,230)</td>
<td>(2,019)</td>
<td>(9,519)</td>
<td>(94)</td>
<td>(84)</td>
<td>(282)</td>
<td>(9)</td>
<td>-</td>
<td>7,807</td>
<td>(18,745)</td>
</tr>
<tr>
<td>Transmission/Dist. Loss (-)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(712)</td>
</tr>
<tr>
<td>Energy Sector Use &amp; Loss (-)</td>
<td>-</td>
<td>(123)</td>
<td>(121)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(719)</td>
</tr>
<tr>
<td><strong>Net Domestic Supply</strong></td>
<td>1,454</td>
<td>65</td>
<td>16,639</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7,212</td>
<td>158</td>
<td>309</td>
<td>6,376</td>
<td>32,213</td>
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<tr>
<td>Statistical Difference</td>
<td>(1,320)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Statistical Difference</td>
<td>(4)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Total Final Energy Consumption</strong></td>
<td>2,852</td>
<td>65</td>
<td>16,561</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>7,212</td>
<td>158</td>
<td>309</td>
<td>6,376</td>
<td>33,533</td>
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<tr>
<td>Industry</td>
<td>2,675</td>
<td>65</td>
<td>1,458</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,164</td>
<td>13</td>
<td>-</td>
<td>2,074</td>
<td>7,447</td>
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<tr>
<td>Transport</td>
<td>-</td>
<td>-</td>
<td>11,881</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>121</td>
<td>309</td>
<td>9</td>
<td>12,319</td>
</tr>
<tr>
<td>Residential</td>
<td>-</td>
<td>-</td>
<td>1,122</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5,709</td>
<td>-</td>
<td>-</td>
<td>2,204</td>
<td>9,035</td>
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<tr>
<td>Commercial</td>
<td>-</td>
<td>-</td>
<td>1,632</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>340</td>
<td>21</td>
<td>-</td>
<td>1,872</td>
<td>3,865</td>
</tr>
<tr>
<td>AFF</td>
<td>-</td>
<td>-</td>
<td>229</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>218</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>Others, Non-energy Use</td>
<td>177</td>
<td>-</td>
<td>239</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>417</td>
<td></td>
</tr>
<tr>
<td><strong>Self-Sufficiency (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55.28</td>
</tr>
</tbody>
</table>
Outlook Process Flow and Methodology

- Macro-Economic Assumptions
  - GDP/GVA
  - Population
  - Energy Price

- Scenario-specific Assumptions
  - Sectoral Roadmaps
  - PDP, TDP, DDP, NREP, EE&C, and others

Actual/ Historical Data

Energy Supply
- Transformation
  - Power Generation
  - Oil Refinery

Energy Balance Table

Energy Demand

Energy Commodity Account

Conversion from Physical Units to Energy Units

Optimized Generation Mix

Over-All EBT (Outlook)

Energy Modelling Tools

MESSAGE

Simple E

Energy Demand Outlook
CURRENT ENERGY SITUATION
Primary Energy Mix

2015 Total Energy: 51.27 MTOE
Self Sufficiency: 52.4%

Renewable Energy (RE) =38.2%
Share of Green Energy (RE+Natgas) = 43.8%

2016 Total Energy: 53.19 MTOE
Self Sufficiency: 55.3%

Renewable Energy (RE) = 37.0%
Share of Green Energy (RE+Natgas) = 43.2%
Total Final Energy Consumption

**2015**

**BY FUEL**
- Biomass: 24.5%
- Biofuels: 1.1%
- Oil: 46.9%
- Natural Gas: 0.2%
- Electricity: 19.6%
- Coal: 7.4%

**BY SECTOR**
- Residential: 29.3%
- Commercial: 11.3%
- Industry: 22.6%
- Agriculture: 1.3%
- Transport: 35.4%

**2016**

**BY FUEL**
- Biomass: 22.4%
- Biofuels: 1.5%
- Oil: 47.9%
- Natural Gas: 0.2%
- Electricity: 19.8%
- Coal: 8.3%

**BY SECTOR**
- Residential: 28.0%
- Commercial: 11.3%
- Industry: 23.1%
- Agriculture: 1.4%
- Transport: 35.5%

TFEC: 29.8 MTOE
TFEC: 32.2 MTOE
2016 Final Energy Consumption

- Industry
- Transport
- Residential
- Commercial
- AFF

Fuel Sources:
- Coal
- Natgas
- Oil
- Biomass
- Biofuel
- Electricity
2015 Total Generation: 82.4 TWh
Self Sufficiency: 53.1%

Renewable Energy (RE) = 25.4%
Share of Green Energy (RE+Natgas) = 48.3%

2016 Total Generation: 90.8 TWh
Self Sufficiency: 51.0%

Renewable Energy (RE) = 24.2%
Share of Green Energy (RE+Natgas) = 46.1%
Installed Capacity Mix

2015 Total Installed Capacity: 18,765.0 MW

- RE+ Natural Gas = 48.98%
- RE = 33.73%

2016 Total Installed Capacity: 21,423.0 MW

- RE+ Natural Gas = 48.49%
- RE = 32.48%
STRATEGIC DIRECTIONS
| **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** |
1. **ENSURE ENERGY SECURITY**

- Audit and assessment for power generation, transmission and distribution facilities
- Appropriate portfolio of installed and dependable power capacity mix of 70% baseload, 20% mid-merit and 10% peaking plant categories matching peak demand and reserves
- Build an LNG Terminal for a future “Clean Energy City”
- Accelerate total privatization of PSALM assets
- Improve reliability, availability and resiliency of energy infrastructure and facilities
- Conduct energy contracting rounds
EXPAND ENERGY ACCESS TO ENSURE AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

- Achieve 100% electrification of targeted identified unelectrified households in all three major islands by 2022
- Connect the Mindanao grid with the interconnected Visayas and Luzon grids by 2020 to increase power supply reliability and resilience
3 PROMOTE A LOW CARBON FUTURE

- Increase RE Capacity by 2030 (based on 2010 level)
- Promote technology innovation through research, development, demonstration and deployment
  - Clean, efficient and smart energy technologies
  - Infrastructure for next generation vehicles
STRENGTHEN COLLABORATION BUILDING AMONG ALL GOVERNMENT AGENCIES INVOLVED IN ENERGY AND ENERGY-RELATED ISSUES

- Implement Executive Order (EO) 30 on Energy Projects of National Significance (EPNS)
- Energy Virtual One Shared System (EVOSS) platform for streamlined permitting
- Capacity and competency building of human resources of the “Energy Family” in the organizational, administrative, financial and legal areas
Implement, Monitor and Integrate Sectoral and Technological Roadmaps and Action Plans

- Alternative fuels and energy technologies
- Energy efficiency and conservation
- Oil, gas and coal resource development
- Renewable energy
- Downstream oil, gas and coal
- Power and electrification
- ICT for energy
ADVOCATE THE PASSAGE OF THE DEPARTMENT’S LEGISLATIVE AGENDA AND ISSUANCE OF PERTINENT RULES AND REGULATION

- Energy Efficiency and Conservation (EE&C), Natural Gas, Liquefied Petroleum Gas (LPG), Petroleum Upstream Regulation
- Review of existing laws such as EPIRA, Downstream Oil Industry, Renewable Energy
STRENGTHEN CONSUMER WELFARE AND PROTECTION THROUGH MULTI-SECTORAL MULTIMEDIA IEC PROGRAMS

- Scale up the *E-Power Mo, E-Safety Mo, E-Secure Mo, E-Diskarte Mo* campaign
- Integrate energy concepts in curriculum for public school students through seminars and field visits
- Promote alternative fuel vehicles and emerging energy technologies
FOSTER STRONGER INTERNATIONAL RELATIONS AND PARTNERSHIPS

- Bilateral and multi-lateral energy cooperation
- Facilitate free trade agreements on energy trade and services
- UN’s Sustainable Energy for All (SE4All)
Thank you.
Salamat po.