2.1 APEC Energy efficiency template

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Outline of Presentation

Background
- Milestone
- Data components

Status of Energy Data Collection
- Submissions/Timeliness
- Completeness

Sample Analysis
- Use of indicators

Way forward

Feedback
Dec 2014
- Introduction of Energy Efficiency template

Dec 2015
- Sent Questionnaire & User Manual

Mar–Apr 2016
- Collection of Questionnaire from APEC economies

Mar–Apr 2016
- Data evaluation

June 2017
- Questionnaire revised per agreement in 28th EGEDA

June 2017
- Submission evaluation
- Data analysis

Nov 2016
- Reported progress in 28th EGEDA

Nov 2016
- Reported progress in 29th EGEDA

Sept–Oct 2017
- Questionnaire revised to include transport and industry sectors as agreed in 29th EGEDA

Jan 2018
- Questionnaire revised to include transport and industry sectors as agreed in 29th EGEDA
# 2017 Revised questionnaire components

## Commercial and Public Services
- Space Heating
- Space Cooling
- Lighting
- Other Building Energy Use
- Non-Building Energy Use
- Total Energy Use in Commercial Sector

## Residential
- Space Heating
- Space Cooling
- Water Heating
- Cooking
- Lighting
- Refrigerators / Freezers
- Other kitchen facilities
- Laundry facilities
- Television/PC and other Home entertainment
- Other Appliances
- Total Energy Use in Residential Sector

### Activity data
- Activity and structure indicators (population, HHs, floor area, etc)
- GDP
- Value added

To analyze energy demand and how to improve energy efficiency, detailed information for energy end-use / energy related data are important for policy makers & energy analysts.
### 2018 Revised questionnaire components

**Transport and Industry Sectors added**

<table>
<thead>
<tr>
<th>Transport sector (by fuel)</th>
<th>Industry sector (by fuel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Road transport</td>
<td>- Food products and textiles</td>
</tr>
<tr>
<td>- Railways</td>
<td>- Wood and wood products</td>
</tr>
<tr>
<td>- Domestic Aviation</td>
<td>- Paper and paper products</td>
</tr>
<tr>
<td>- Inland waterways</td>
<td>- Chemicals, basic pharmaceuticals, petrochemicals</td>
</tr>
</tbody>
</table>

#### Activity data

- Number of vehicles (by type, by mode, by fuel type)
- Passenger-km (Passenger)
- Vehicle-km
- Tonne-km (Freight)
Status of Data Collection
### 2016 Revised EE template submission (1)

<table>
<thead>
<tr>
<th><strong>13 APEC-Non-OECD members</strong></th>
<th><strong>June 2018</strong></th>
<th><strong>Remarks</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted</td>
<td>number</td>
<td>Timeliness</td>
</tr>
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<td></td>
<td>6</td>
<td>5</td>
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<tr>
<td>No submission</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

*Thailand shared some information, unfortunately not useful at the moment*

<table>
<thead>
<tr>
<th><strong>IEA/OECD members</strong></th>
<th><strong>June 2018</strong></th>
<th><strong>Remarks</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared</td>
<td>number</td>
<td>Completeness</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Chile shared old survey result but it still needs to be reflected in Chile’s end use data
<table>
<thead>
<tr>
<th>Economy</th>
<th>Activity</th>
<th>Commercial</th>
<th>Residential</th>
<th>Transport</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD</td>
<td>No HH and transport related data; value added;</td>
<td>Aggregated data (by fuel)</td>
<td>By fuel/mode</td>
<td>Aggregated data</td>
<td></td>
</tr>
<tr>
<td>HKC</td>
<td>No data on heating/cooling; passenger-km; vehicle-km</td>
<td>Disaggregated by end-use</td>
<td>By fuel/mode</td>
<td>By industry sub-sector</td>
<td></td>
</tr>
<tr>
<td>PHL</td>
<td>No data on heating/cooling; passenger-km; vehicle-km</td>
<td>Aggregated data (by fuel)</td>
<td>By fuel/mode</td>
<td>By industry sub-sector</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>No data on heating/cooling; GVA and transport data</td>
<td>Aggregated data</td>
<td>By fuel/mode</td>
<td>By industry sub-sector</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td>Time-series gaps</td>
<td>Disaggregated by end-use</td>
<td>By fuel/mode</td>
<td>By industry sub-sector</td>
<td></td>
</tr>
</tbody>
</table>
Electricity is the major fuel in the commercial sector

Source: Members' submission
Electricity is the major fuel in the residential sector in BD; HKC and CT; renewables in the PHL and THA; heat in RUS.
Energy consumption per capita varied per economy; in commercial sector, energy per capita requirement increased together with income per capita.

In HKC and RUS energy per capita in residential sector were almost constant while income per capita increased;
Income drives electricity consumption per person, as income increases, electricity consumption per capita increases; in RUS and HKC, household electricity consumption was almost constant while income increases faster; in THA, electricity consumption grew faster than income per capita.

Electricity has the biggest potential for energy efficiency.

Source: Members’ submission
Energy intensity (Service sector)

by GVA (ktoe/GVA)

By employees) (Ktoe/service worker)

Source: Members’ submission

- Energy intensity ktoe/GVA services constant 2010 USD and ktoe/services have different patterns but both show improvement over time

*CT – GVA was constant LCU
GVA for services/Number of service workers

- Value of output provided by each worker in the services sector was increasing overtime; BD’s case is unique as its income depends largely on oil and gas production.

Source: Members’ submission
Hong Kong electricity consumption

- **Electricity consumption grew by CAGR 1.8% since 2001; space cooling and lighting declined by 2.2; space heating by 5.7% and all others increased by 2.1%**
- **Aside from all others, space cooling share was 27%; lighting share 15% and space heating share was very small, on average**
Energy intensity in the commercial sector of HK continuously improving since 2000

Source: Economy submission
Energy consumption in the manufacturing declined by 0.11% since 1990

Energy intensive industries include manufacturing of chemicals and petrochemicals (32%) and manufacturing of basic metals [iron and steel] (27%)
Japan – Intensity analysis

- Growth in manufacturing GVA (0.7%) surpassed growth in total manufacturing energy consumption (-0.11%) since 1990
- Decline in Japan’s energy consumption in manufacturing sector was mostly due to Structural effect and Activity effect
  - energy intensive industries have a smaller share of GDP compared with the base year
- The Pure intensity effect was obvious after 2005

Source: EGEDA (Energy data), World Bank (GVA)
## Variables used in decomposition

<table>
<thead>
<tr>
<th>Sector</th>
<th>Sub-sector</th>
<th>Activity (A)</th>
<th>Structure (S)</th>
<th>Intensity (I=E/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Household</strong></td>
<td>Space heating</td>
<td>Population</td>
<td>Flr area/capita</td>
<td>Heat/floor area</td>
</tr>
<tr>
<td></td>
<td>Water heating</td>
<td></td>
<td>Person/hh</td>
<td>Energy/capita</td>
</tr>
<tr>
<td></td>
<td>Cooking</td>
<td></td>
<td>Person/hh</td>
<td>Energy/capita</td>
</tr>
<tr>
<td></td>
<td>Lighting</td>
<td></td>
<td>Flr area/capita</td>
<td>Electricity/flr area</td>
</tr>
<tr>
<td></td>
<td>Appliance</td>
<td></td>
<td>Ownership/capita</td>
<td>Energy/appliance</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td>Cars</td>
<td>Passenger-km</td>
<td>Share of total passenger-km</td>
<td>Energy/pasenger-km</td>
</tr>
<tr>
<td></td>
<td>Bus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dom air</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service</strong></td>
<td>Total services</td>
<td>Services GDP</td>
<td></td>
<td>Energy/GDP</td>
</tr>
<tr>
<td><strong>Manufacturing</strong></td>
<td>Paper and pulp</td>
<td>Share of value added</td>
<td></td>
<td>Energy/value added</td>
</tr>
<tr>
<td></td>
<td>Chemicals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-metallic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Iron and steel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-ferrous metals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Food and bev</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other industry</strong></td>
<td>Agri and fishing</td>
<td>Share of total value added</td>
<td></td>
<td>Energy/value added</td>
</tr>
<tr>
<td></td>
<td>Mining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td></td>
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</tr>
</tbody>
</table>
Way forward

- Continue analysing other sectors;
- ESTO will make a study on energy efficiency indicators;
- Assess template which indicators can be obtained or estimated; needs to be simplified.
Feedback on filling out EE template?
- problems encountered
- share experiences in filling-out

How can ESTO help in filling out the data?
We appreciate any feedback
Thank you for your kind attention

http://www.egeda.ewg.apec.org