Thailand: Country Update

The Association of Siamese Architects under Royal Patronage

23 May 2017
Compiled by Dr. Acharawan Chutarat
1 Key Policies and Trends
Key Policies and Trends - Paris Agreement and Thailand

**Efficiency**
Reduce energy intensity by 30% compared with 2010 by 2036 through the removal of fossil-fuel subsidies and accelerated energy efficiency improvements.

**Renewables**
Renewables to reach 20% of power generation by; biofuels to reach 20% of transport fuel use by 2036.

**Nuclear**
Two commercial reactors have been planned since 2007, although progress has stalled since the Fukushima Daiichi accident.
## Key Policies and Trends -

### Power Development Plan (PDP2015)

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Percentage in 2014</th>
<th>Percentage in 2026</th>
<th>Percentage in 2036</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imported hydro power</td>
<td>7</td>
<td>10 - 15</td>
<td>15 – 20</td>
</tr>
<tr>
<td>Clean coal including lignite</td>
<td>20</td>
<td>20 - 25</td>
<td>20 – 25</td>
</tr>
<tr>
<td>Renewable energy including hydro</td>
<td>8</td>
<td>10 - 20</td>
<td>15 – 20</td>
</tr>
<tr>
<td>Natural gas</td>
<td>64</td>
<td>45 - 50</td>
<td>30 – 40</td>
</tr>
<tr>
<td>Nuclear</td>
<td>-</td>
<td>-</td>
<td>0 – 5</td>
</tr>
<tr>
<td>Diesel/Fuel oil</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>2.0</td>
<td>4.0</td>
<td>4.4</td>
<td>4.7</td>
<td>4.3</td>
<td>4.1</td>
<td>4.2</td>
<td>4.2</td>
<td>4.1</td>
<td>4.0</td>
<td>4.1</td>
<td>4.0</td>
</tr>
</tbody>
</table>

GDP Average growth: 3.94% per year
AEDP2015 target is to replace 30 percent of final energy consumption with RE in from of electricity, heat and Bio-fuel by 2036

<table>
<thead>
<tr>
<th>Energy</th>
<th>Share of RE (%)</th>
<th>Final Energy Consumption at 2036</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Status As of 2014</td>
<td>Target by 2036</td>
</tr>
<tr>
<td>Electricity: Electricity</td>
<td>9</td>
<td>15 - 20</td>
</tr>
<tr>
<td>Heat: Heat</td>
<td>17</td>
<td>30 - 35</td>
</tr>
<tr>
<td>Bio-fuels: Fuels</td>
<td>7</td>
<td>20 - 25</td>
</tr>
<tr>
<td>RE : Final Energy Consumption</td>
<td>12</td>
<td>30</td>
</tr>
</tbody>
</table>
“Reduced expandable use of energy and Energy efficiency improvement”
## Key Policies and Trends - Energy Efficiency Plan (EEP2015)

| High Energy Performance Standards (HEPs) + Minimum Energy Performance Standards (MEPs) | VEHICLES-high EE vehicles, mandatory energy labeling, enforcement of MEPs  
| Enforcement of MEPs for appliances, buildings and vehicles |
> 2000 m²: 5 majors: OTTV-RTTV, Lighting, A/C, hot water, whole building compliance and Renewable energy |
| Energy Efficiency Labeling | Mandatory of Labeling for appliances, buildings and vehicles, Environmental Impact Assessment (EIA)-for >4000m² residential, >10,000m² commercial project  
EGAT’s electrical appliance labeling  
Thai Green Building Institute labeling (TGBI) |
| Monetary Incentives | Funds for amount of energy saved, R&D technologies, HR, ESCO, low interest rate, tax, EE product cost subsidy 20% and < 3M Baht, soft loan Government Housing Bank (GHB)  
Standard offer Program (SOP)  
Technical assistance for EERS |
| Energy Efficiency Resource Standards (EERS) | Large scale energy business is required for minimum EERS |

**a revised Building Energy Code to be effective in 2017 for large buildings > 10,000 sqm., new and old. In 2019 will apply to buildings > 5,000 sqm., and to > 2,000 sqm. in 2022.**
### Key Policies and Trends - The new Building Energy Code (BEC) + Web-based tool

<table>
<thead>
<tr>
<th>Policy</th>
<th>Existing BEC</th>
<th>Draft New BEC (late 2017 or early 2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max. RTTV</strong></td>
<td>Max. LPD</td>
<td></td>
</tr>
<tr>
<td>(Roof Thermal Transfer Value)</td>
<td>15, 12, 10 W/m²</td>
<td>10, 8, 6 W/m²</td>
</tr>
<tr>
<td>For building type A,B,C*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. OTTV</strong></td>
<td>Max. LPD</td>
<td></td>
</tr>
<tr>
<td>(Overall Thermal Transfer Value)</td>
<td>50, 40, 30 W/m²</td>
<td>50, 40, 30 W/m²</td>
</tr>
<tr>
<td>For building type A,B,C*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. LPD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Lighting Power Density)</td>
<td>14, 18, 12 W/m²</td>
<td>10, 11, 12 W/m²</td>
</tr>
<tr>
<td>For building type A,B,C*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A/C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split type</td>
<td>COP &gt; 3.22 (</td>
<td>COP &gt; 3.22-4.39 (</td>
</tr>
<tr>
<td></td>
<td>Split type</td>
<td>kW/ton &lt; 1.12</td>
</tr>
<tr>
<td>Air-cooled chiller</td>
<td>kW/ton &lt; 1.31-1.33</td>
<td>kW/ton &lt; 1.12</td>
</tr>
<tr>
<td>Reciprocating</td>
<td>kW/ton &lt; 1.24</td>
<td>kW/ton &lt; 0.88</td>
</tr>
<tr>
<td>Rotary /Screw and Scroll</td>
<td>kW/ton &lt; 0.78-0.89</td>
<td>kW/ton &lt; 0.70</td>
</tr>
<tr>
<td>Centrifugal</td>
<td>kW/ton &lt; 0.62-0.76</td>
<td>kW/ton &lt; 0.61-0.67</td>
</tr>
<tr>
<td><strong>Renewable Energy</strong></td>
<td>Only PV energy is considered.</td>
<td>PV energy, Heat to electrical energy, and Other renewable energy are considered.</td>
</tr>
</tbody>
</table>

* Type A = Office, School
  Type B = Commercial and public buildings
  Type C = Hotel, Healthcare, Apartment
• identifies “Green City” project and carbon reduction plan in its sustainable development strategy.
• enacts laws requiring Strategic Environmental Assessment (SEA) in public policies, plans, programs.

Office of Natural Resources and Environmental Policy and Planning (ONEP)

• develops “Low-Carbon City” strategies and collaborates with municipalities to plan and implement district development programs.
Thailand Regulatory Roadmap
National and PEA Plans and Policies – Smart Grid Focused

Master plan of smart grid development 2015-2036

Strategies & Objectives

- Security
  - Improved Reliability (e.g., SAIDI, SAIFI)
  - Improved Power Quality (V, F)

- Competitiveness
  - Economic and Industrial Stimulus
    - Human Capacity Building
    - Enhanced EMS for Competitiveness
    - SG Technology, Product and Service Development & Export

- Sufficiency
  - Energy Sustainability and Efficiency
    - RE/Domestic Energy Dependency
    - Improved Utility Asset Management
    - Primary Energy Efficiency
    - Microgrid Development

- Awareness
  - Device and ICT Upgrading for Interoperability
  - Accessibility and Interchangeability

- Integration and Interoperability
  - Interoperability
  - Improved Quality of Services / New Services
  - Work Process Efficiency
Thai’s Rating of Energy and Environmental Sustainability, not yet endorsed by government.

**Released:**
1. TREES – NC V1.1 for New Construction and Major Renovation
2. TREES – PRE NC (for FAR Bonus) for Preparation of New Construction and Major Renovation
3. TREES – NC / CS for New Construction and Major Renovation and Core and Shell Building
4. TREES – EB (Existing Building)

**Developing:**
TREES – NC V1.2

**TREES**
Thai’s Rating of Energy and Environmental Sustainability
Bangkok New City Planning Code

1. Affordable housing

2. Urban public space

3. Mass transit Park & Ride

4. Rain water retention can have 5% more buildable area

5. Green building

Developments that are certified green (TGBI) can have 5-20% more buildable area

- 5% for 1st Level (Certified)
- 10% for 2nd Level (Silver)
- 15% for 3rd Level (Gold)
- 20% for 4th Level (Platinum)

Must pass OTTV/RTTV of the Thai Building Energy Code

within 500 m radius from mass transit station: 30 m² bonus floor area per 1 free parking space

50 m² of site area per 1 m³ of water retention

Credit: Dr.Atch S.
Thai Green Building Institute (TGBI) refused to become GBC member.

Membership fee, organization and requirements and benefits benefits
2 Resilient/Sustainable Projects
Green Certificate and Supports

- Green Label Program (Thai Environmental Institute)
- Green Leaf Hotel
- “Number 5” electrical appliances (EGAT)
- Energy Labeling Program (DEDE)
- Thailand Energy Awards
- ASA Green Building Award
- Thai Green Building Institute (ASA/EIT)
- Pollution Control Department (Green Government Building)

Adapted from: Dr. Atch S.
Resilient / Sustainable Projects -
Low Carbon Municipality Projects (2012-2015)

- Initiated by National Municipality League of Thailand (NMT) with support from European Union from 2012-2015
- Total 175 cities (N 61, NE 56, Central 20, E 14, S 24) participated to gain awareness, knowledge, changes toward low carbon cities under 4 strategies.
- Implemented with measurable KPIs, follow up procedures and PR
- Results from potential cities to be further developed have been fully implemented in 2015-2017

http://www.lcm.in.th/about-project.php
Resilient / Sustainable Projects -

- Local vision, mission, policies and strategic action with objectives and time frame
- Assigned tasks to responsible teams with policies to strengthen and drive organization and public
- Create activities to build understanding, potential and knowledge with database system
- Communicate and PR to all stakeholders through participatory processes and follow up procedures for lesson learned.

Happy, Well-Being People
Sustainable Environment
Asian Cities Climate Change Resilience Network: ACCCRN
- Hadyai and Chiangrai as pilot projects

Mekong-Building Climate Resilience Asian Cities: M-BRACE
- Udornthani and Phuket as pilot projects

Urban Climate Resilience in Southeast Asia Partnership Project
Resilient / Sustainable Projects - Smart Cities Clean Energy: Implement 7 cities (22 May, 2017)
Resilient / Sustainable Projects -

Bangkok Resilient City: 3 Strategic Pillars

Official announcement and 70+ projects, launched, February, 2017

- Flood
- Quality of Life
- Economic

Scope of the Master Plan

(1) Environmental Sustainable Transport;
(2) Energy Efficiency and Alternative Energy;
(3) Efficient Solid waste management and Wastewater Treatment,
(4) Green Urban Planning; and
(5) Adaptation planning

Bangkok Strategic Plan Objectives

<table>
<thead>
<tr>
<th>Sector</th>
<th>GHG emission</th>
<th>Future GHG emission in BAU Scenario</th>
<th>Future GHG emission with Bangkok Master Plan Implementation</th>
<th>Expected reduction/absorption amount (reduction rate against BAU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>13.76</td>
<td>17.91</td>
<td>14.91</td>
<td>3.00 (-16.75%)</td>
</tr>
<tr>
<td>Energy</td>
<td>25.60</td>
<td>30.94</td>
<td>26.85</td>
<td>4.09 (-13.22%)</td>
</tr>
<tr>
<td>Waste and wastewater</td>
<td>4.55</td>
<td>4.93</td>
<td>4.73</td>
<td>0.20 (-4.06%)</td>
</tr>
<tr>
<td>Green urban planning</td>
<td>-0.045</td>
<td>-0.045</td>
<td>-0.049</td>
<td>-0.004 (+8.89%)</td>
</tr>
<tr>
<td>Total</td>
<td>43.87</td>
<td>53.74</td>
<td>46.44</td>
<td>7.29 (13.57%)</td>
</tr>
</tbody>
</table>

BAU emission and mitigation targets in 2020 (by Sector)

100 Resilient Cities—Pioneered by the Rockefeller Foundation (100RC)
Thank you