8th LoCARNet
How We Could Promote Evidence-Based Policymaking by Bridging the Gap between Policymakers and Research Communities?

8 November 2019
Beijing, CHINA

Climate Change Policies and Roles of Research Communities in Thailand

Bundit Limmeechokchai
SIIT, Thammasat University
Challenge of Thailand Climate Change Scenario Development

Statement of the Problem

Background/Knowledge

AIM

In-house teamwork

Seniors/Experts

Outcomes of Low Carbon Development

Impacts

2-Degree Pathways

Co-benefits
GHG EMISSIONS

- Residential
- Industry
- Commercial
- Passenger transport
- Freight transport

GHG Emissions (kt-CO₂)

- 2005: 185,983
- 2030 BAU: 563,730
- 2030 CM: 324,170

Remarks: BAU is Business as Usual
CM is Countermeasure

Source: Bundit L. et al., 2011
## RENEWABLE ENERGY FOR SUPPLY SIDE

<table>
<thead>
<tr>
<th>Source: Bundit L. et al., 2011</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Primary Energy Demand (ktoe)</th>
<th>2005</th>
<th>2030BAU</th>
<th>2030CM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>11,853</td>
<td>34,369</td>
<td>38,658</td>
</tr>
<tr>
<td>Solar &amp; Wind</td>
<td>12,370</td>
<td>36,178</td>
<td>50,825</td>
</tr>
<tr>
<td>Biomass</td>
<td></td>
<td></td>
<td>14,647 ktoe</td>
</tr>
<tr>
<td>Nuclear</td>
<td></td>
<td></td>
<td>41%</td>
</tr>
</tbody>
</table>

**Total Energy Demand (ktoe):** 50,825

**Renewable Energy (%):** 41%
## Alternative Energy Development Plan 2015 vs 2018

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Target 2036</td>
<td>Existing</td>
<td>PDP2018</td>
</tr>
<tr>
<td>Solar PV</td>
<td>6,000</td>
<td>2,849</td>
<td>12,725</td>
</tr>
<tr>
<td>Biomass</td>
<td>5,570</td>
<td>2,290</td>
<td>3,496</td>
</tr>
<tr>
<td>Wind</td>
<td>3,002</td>
<td>1,504</td>
<td>1,485</td>
</tr>
<tr>
<td>Biogas (Waste)</td>
<td>600</td>
<td>382</td>
<td>546</td>
</tr>
<tr>
<td>Municipal Solid Waste</td>
<td>500</td>
<td>500</td>
<td>400</td>
</tr>
<tr>
<td>Industrial waste</td>
<td>50</td>
<td>31</td>
<td>44</td>
</tr>
<tr>
<td>Mini-hydro</td>
<td>376</td>
<td>188</td>
<td>-</td>
</tr>
<tr>
<td>Large hydro (EGAT)</td>
<td>2,906</td>
<td>2,918</td>
<td>-</td>
</tr>
<tr>
<td>Biogas (Crop)</td>
<td>680</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19,684</strong></td>
<td><strong>10,662</strong></td>
<td><strong>18,696</strong></td>
</tr>
<tr>
<td><strong>RE electricity (%)</strong></td>
<td><strong>20%</strong></td>
<td><strong>10%</strong></td>
<td><strong>20%</strong></td>
</tr>
</tbody>
</table>

Source: Ministry of Energy, 2019
LCS Forecasting & Backcasting

Where is society going?

Target 2050

How do we get there?

2 Degree PATHWAY
Key concept of AIM/Enduse Modeling

Technology System in Modeling

• Technology consumes energy and produces service

• By using this energy-technology-service relation, the model user defines technology system.

Source: AIM (NIES, 2010)
Methodology of Roadmaps for NAMA & NDCs

Information and data collection
- Identification of data needs and data sources.
  Preliminary data formulation

Synthesis and Preliminary Analysis
- Information collection for present practices and policies
- Data compilation and putting the data in required formats

Modeling and Analysis
- Estimation of energy and emissions
- Developing scenarios
- Developing narratives & story lines

Developing NDC
- Analysis of finding and developing NDC
- Recommendations of NDC
Roadmap to Low Carbon Thailand towards 2050
Roadmap to Low Carbon Thailand towards 2050

Technology Mix in the **Clean Power Generation**

![Graph showing technology mix in clean power generation](image-url)
Roadmap to Low Carbon Thailand towards 2050

**Technology Mix in the Convenient Transport**

- Patrol sedan
- Ethanol/B5 van
- LPG/CNG tuktuk
- Patrol motorcycle
- LPG/CNG bus
- Patrol Pickup
- Ethanol/B5 Truck
- Fuel oil Ship
- Plugin Hybrid-Biofuel Sedan
- Hybrid-Biofuel Taxi
- Electric Train
- B10/B20 Pickup
- Ethanol/B5 sedan
- LPG/CNG van
- Patrol taxi
- Ethanol motorcycle
- Patrol others
- Ethanol/B5 Pickup
- LPG/CNG Truck
- Diesel Ship
- Electric sedan
- Plugin Hybrid-Biofuel Taxi
- B10/B20 Bus
- B10/B20 Truck
- LPG/CNG sedan
- Patrol tuktuk
- Ethanol/B5 taxi
- Patrol bus
- Ethanol/B5 others
- LPG/CNG Pickup
- Diesel Freigh Train
- Jet fuel Aircraft
- Hybrid-Biofuel Van
- Electric Taxi
- B10/B20 Others
- Patrol van
- Ethanol/B5 tuktuk
- LPG/CNG taxi
- Ethanol/B5 bus
- LPG/CNG others
- Patrol Truck
- Electric Freight Train
- Hybrid-Biofuel Sedan
- B10/B20 Van
- Electric Motorcycle
- Hybrid-Biofuel Pickup
Institutions towards Low-Carbon Growth in Thailand

National Committee on Climate Change Policy (NCCC)

Prime Minister
Chair

Minister of Natural Resources and Environment
Vice-Chair

Minister of Foreign Affairs

NCCC members:
1. Prime Minister’s Office
2. Ministry of Finance
3. Ministry of Agriculture and Cooperatives
4. Ministry of Transport and Communications
5. Ministry of Information and Communication Technology

6. Ministry of Energy
7. Ministry of Commerce
8. Ministry of Interior
9. Ministry of Science and Technology
10. Ministry of Education
11. Ministry of Public Health
12. Ministry of Industry

13. Bangkok Metropolitan Administration
14. Office of the National Economics and Social Development Board (NESDB)
15. Bureau of Budget
16. 5-9 Experts

Secretariat
Permanent Secretary, Ministry of Natural Resources and Environment

Integrated Policy and Plan Sub Committee
Chair: Permanent Secretary, MNRE
Vice-Chair1: Secretary General, ONEP
Vice-Chair2: Secretary General, NESDB
Members: 24 persons
Secretariat: ONEP

Technical and GHG Data base Sub Committee
Chair: Secretary General, ONEP
Vice-Chair: Executive Director, TGO
Members: 28 persons
Secretariat: ONEP & TGO & DEQP

Coordination & Negotiation Sub Committee
Chair: Permanent Secretary, MNRE
Vice-Chair1: Secretary General, ONEP
Vice-Chair2: Director-General of the Department of International Organizations (DIO)
Members: 14 persons
Secretariat: ONEP & DIO

Source: MONRE, 2012
Potentials of CO₂ Countermeasures in Thailand’s NAMAs in 2020

Source: Thailand NAMAs, 2011
Criteria for Domestic & Internationally Supported NAMAs

>>> Abatement Cost ($/t-CO_2) <<<

Bundled NAMAs Leverage Emission Reductions

Source: Bundit L. et al., 2011
## Co-benefits of Thailand NAMAs

### Energy Security due to Thailand’s NAMAs

<table>
<thead>
<tr>
<th>Year</th>
<th>SWI*</th>
<th>DoPED**</th>
<th>Oil Intensity (toe/1000 USD)</th>
<th>Gas Intensity (toe/1000 USD)</th>
<th>Energy Intensity (toe/1000 USD)</th>
<th>CO₂ emissions intensity (t-CO₂/USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1.34</td>
<td>68.82</td>
<td>0.111</td>
<td>0.079</td>
<td>0.280</td>
<td>0.696</td>
</tr>
<tr>
<td>2020 BAU</td>
<td>1.35</td>
<td>69.24</td>
<td>0.093</td>
<td>0.077</td>
<td>0.260</td>
<td>0.556</td>
</tr>
<tr>
<td>2020 NAMA</td>
<td>1.44</td>
<td>74.18</td>
<td>0.069</td>
<td>0.045</td>
<td>0.197</td>
<td>0.456</td>
</tr>
</tbody>
</table>

* SWI: Shannon-Wiener index  
**DoPED: Index for diversification of primary energy demand

Source: Thailand NAMAs, 2011
Thailand’s PM Delivered National Climate Pledge at Paris Summit

“The 20% is a goal to be achieved by the country's resources alone while the additional 5% will require international support in terms of finance, knowhow and technology”
THAILAND’S GHG EMISSION AND MITIGATION: NDC 2030

GHG Emission (MtCO$_2$eq)

2005: 237.4 MtCO$_2$eq
2030: 555.0 MtCO$_2$eq
2030NDC: 439.4 MtCO$_2$eq

GHG mitigation 20%

- Power 24 MtCO$_2$eq
- Industry 43 MtCO$_2$eq
- Transport 41 MtCO$_2$eq
- Residential 4 MtCO$_2$eq
- Commercial 1 MtCO$_2$eq
- IPPU 0.6 MtCO$_2$eq
- Waste 2 MtCO$_2$eq

Total GHG mitigation: 115.6 MtCO$_2$eq
THAILAND’S GHG MITIGATION: NAMA 2020 AND NDC 2030

Source: TNC, UNFCCC (2018)
Trends of GHG emissions and Total final energy consumption: 2000-2013

Source: Thailand’s third national communication
Thailand Greenhouse Gases Emissions Inventory System (TGEIS) (JUL 2018)

Source: Thailand’s third national communication
AIM Training Workshop in Thailand
AIM/Enduse Training Workshop at SIIT-TU, Thailand
June 2018 (Beginning level for Policy maker)
AIM Training Workshop in Thailand
CGE Training Workshop at SIIT-TU, Thailand
June 2018 (Beginning level for Policy Makers)

Participant: Bhutan, Thailand: ONEP & CITC, SIIT-TU, JICA-Thailand
Climate Change Policies and Mitigation in THAILAND

BANGKOK, 30 October 2019
Sharing of View on Climate Change Policies and Mitigation Actions in THAILAND
Pullman KingPower Hotel, BANGKOK, 30 October 2019
Thailand's National Strategy for 20 years
Royal Thai Government Gazette, 13 OCT 2018

6 strategies
- National security
- Competitiveness
- Human resources development and empowerment
- Opportunities and social equality
- GROWTH ON ENVIRONMENTAL FRIENDLY QUALITY OF LIFE
- Balancing and developing the governmental management system

To create sustainable growth in a climate-friendly society focusing on “REDUCING GHG EMISSION” and “CREATING A LOW CARBON SOCIETY”
The spirit of LoCARNet
A Japanese old maxim

- You cannot say you mastered knowledge until you use it in action on the ground

Ekiken Kaibara (1630-1714)

- 知っていてもそれを行動に移さないのであれば、知らない者となんらかわりは無い。