Lesson Learned from Development of NAMAs in the Building Sector in Asia: Thailand

Worapon Mathurosmanatee
Environmentalist
Climate Change Management and Coordination Division
Office of Natural Resources and Environmental Policy and Planning
Content

- NAMAs in the Building Sector in Thailand
  - Housing
  - Public Building
NAMAs in the Building Sector in Thailand

Office of Natural and Environmental Policy and Planning (ONEP)
- Focal point

King Mongkut’s University of Technology Thonburi (KMUTT)
- Technical Advisor

Pollution Control Department (PCD)
- Implementing Agency

UN Environment
- Coordinating Agency

Electricity Generating Authority of Thailand (EGAT)
- Implementing Agency

National Housing Authority (NHA)
- Implementing Agency
NAMAs in the Building Sector in Thailand

- Housing
- Public Building
Housing NAMAs
Energy Use in Residential Sector in Thailand

Source: Department of Alternative Energy Development and Efficiency
Concept

Key Implementer

National Housing Authority

EGAT
Power for Thai Happiness

Activities

- Reduce Green house cost by research and Market activities
- Standard setting and labelling scheme
- Marketing and capacity building
- Financial supports in form of low interest loan

NHA built greener houses for low and middle income buyers and drive the housing market to green standard
Project Activities

1. Revise and harmonize green housing standard
2. Develop labelling scheme for housing
3. Research the cost structure of green products and green house cost
4. Market activities with product suppliers by standard setting, certification and marketing
5. Financial supports for incremental cost which will come from green housing fund, source from government and seed fund from NAMAs
6. Capacity building of all stakeholders
7. MRV units
Targets

Supply green 58,034 residential units at affordable price to low & middle income buyers in 5 years

Lower the price of green materials and efficient low income houses in the market

Develop standard and green and energy efficient label for houses

Raise market awareness for greener houses
## Emission Reduction Potential

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Standard house</th>
<th>Green house</th>
<th>Green house</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of units</td>
<td>Investment cost (MB)</td>
<td>Energy use (MWh)</td>
</tr>
<tr>
<td>Single House</td>
<td>13,964</td>
<td>22,525</td>
<td>395,563</td>
</tr>
<tr>
<td>Twin House</td>
<td>7,344</td>
<td>9,931</td>
<td>228,269</td>
</tr>
<tr>
<td>Row House</td>
<td>7,524</td>
<td>6,890</td>
<td>147,761</td>
</tr>
<tr>
<td>Condominium</td>
<td>29,211</td>
<td>11,458</td>
<td>678,730</td>
</tr>
<tr>
<td>Total</td>
<td>58,043</td>
<td>50,804</td>
<td>1,450,323</td>
</tr>
</tbody>
</table>

**Number of units:** 58,034 units  
**Investment:** 50,804 Million Baht  
**Incremental cost:** 826 Million Baht  
**Energy saving:** 689,328 MWh in 10 years  
**Emission reduction:** 450,225 ton in 10 years
Financial Mechanism

Project support from NAMAs for research and market activities

Green Housing Fund
- Local fund
- NAMA seed fund

Government and NHA Budget

Housing market

Incremental cost for green

low & middle income houses
Transformation and Sustainability

**Transformation**
- impact on housing market to move to green house

**Sustainability**
- Create need of green materials and lower the market cost by high volume
- Better the standard of living of low income
Organisation and Management

Project committee

- Financial and Reporting unit
- Implementation entity (NHA, EGAT)
- MRV and Evaluation

Project management

- Construction works
- Research
- Market activities
- Capacity building
- Certification and labelling
## Expected Impacts

<table>
<thead>
<tr>
<th>Components</th>
<th>Status</th>
</tr>
</thead>
</table>
| GHG reductions:  
  • GHG mitigation scenarios  
  • Estimated GHG impact and how it relates to national targets | **Pending**  
  Calculations needs to be verified. KMUTT will share survey data with project team. |
| Transformation Change  
  • How does the NAMA contribute to a transformation within the (sub)national building sector or within building sector policy | **Complete**  
  - To transform residential sector to green housing, through lowering of green housing cost, and raising awareness  
  - At equipment level, to achieve 100% adoption rate for EE lighting, EE A/C |
| Sustainable development benefits:  
  • What other benefits are achieved through the NAMA (social, environmental, economic, health etc.) | **Complete**  
  <next slide> |
# Co-Benefits

## Economic
- Reduced electricity bill for consumers
- Increased energy security from demand-side reductions
- Increased technology uptake and potential attraction of investors

## Environmental
- Reduced GHG emissions from reduced electricity generation
- Reduced use of water and other natural resources
- Adaptation to climate change effects (e.g. through passive design to reduce heat gain, rainwater storage facilities)

## Social
- Welfare gains from reduced electricity bills, especially for the lower income population
- Positive health effects from better air quality
- Job creation and economic development
- Capacity building and skills development
Government Policy on NHA House

Subsidy for the house cost below 800,000 baht
Green Housing Pilot Projects

- Patum Thani: 589 units
- Si Sa Ket: 345 units
- Rayong: 334 units

- Mid-scale housing projects
- Expected construction on July 2017 - October 2018
- Focus on energy efficient standards in green construction, maintenance and long-term evaluation
Public Building
Energy Use in Public Building in Thailand

- Public building use 3.2-3.5% of Thailand electricity consumption and about 20% of all commercial building use
- Existing buildings not governed by Building Energy Code
- Improvement Potentials is available
Concept

Key Implementer

Activities

1. Standard revision
2. Evaluation and MRV
3. Propose to government
4. Assess and certify
5. Capacity building

UNFCCC registration
ONEP
NAMA recognition

EGAT
Power for Thai Happiness

ESCO Financial Model
## Emission Reduction Potential: Large Government Buildings

<table>
<thead>
<tr>
<th>Government BLDG.</th>
<th>number (bldg.)</th>
<th>Electricity use (kWh/y)</th>
<th>Energy saving (kWh/y)</th>
<th>Investment (baht)</th>
<th>GHG reduction (ton/y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>331</td>
<td>893,881,667</td>
<td>187,385,387</td>
<td>3,481,354,773</td>
<td>97,721</td>
</tr>
<tr>
<td>Education</td>
<td>128</td>
<td>1,018,708,956</td>
<td>164,580,570</td>
<td>2,744,855,958</td>
<td>85,829</td>
</tr>
<tr>
<td>Hospital</td>
<td>180</td>
<td>860,540,546</td>
<td>164,961,056</td>
<td>1,616,004,443</td>
<td>86,027</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>639</strong></td>
<td><strong>2,773,131,169</strong></td>
<td><strong>516,927,014</strong></td>
<td><strong>7,842,215,175</strong></td>
<td><strong>269,577</strong></td>
</tr>
</tbody>
</table>

The potential of GHG reduction in existing large buildings is 269,577 ton/yr.
### Emission Reduction Potential: Pilot Government Buildings

<table>
<thead>
<tr>
<th>Parameters</th>
<th>value</th>
<th>unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of buildings</td>
<td>10</td>
<td>Bldg./year</td>
</tr>
<tr>
<td>Total building area</td>
<td>89,232</td>
<td>Sq.meter</td>
</tr>
<tr>
<td>Investment</td>
<td>48</td>
<td>Million Baht/year</td>
</tr>
<tr>
<td>Energy saving</td>
<td>3,132</td>
<td>MWh/year</td>
</tr>
<tr>
<td>Energy cost saving</td>
<td>12.53</td>
<td>Million Baht/year</td>
</tr>
<tr>
<td>Emission reduction</td>
<td>1,634</td>
<td>Ton/year</td>
</tr>
</tbody>
</table>
Transformation and Sustainability

Transformation

- All Government buildings move to better quality and energy efficiency
- Revise the budgetary system to support green buildings

Sustainability

- Government policy to improve existing buildings
## Expected Impacts

<table>
<thead>
<tr>
<th>Components</th>
<th>Status</th>
</tr>
</thead>
</table>
| **GHG reductions:**  
  • GHG mitigation scenarios  
  • Estimated GHG impact and how it relates to national targets | **Pending**  
Calculations needs to be verified. KMUTT will provide data on existing public building stock data for scenario planning. |
| **Transformation Change**  
  • How does the NAMA contribute to a transformation within the (sub)national building sector or within building sector policy | **Complete**  
- 100% green existing public buildings, through policy for retrofitting buildings  
- To transform private sector to achieve green commercial buildings (lower cost, raising awareness)  
- At equipment level, to achieve 100% adoption rate for EE lighting, EE A/C, EE office equipment |
| **Sustainable development benefits:**  
  • What other benefits are achieved through the NAMA (social, environmental, economic, health etc.) | **Complete**  
<next slide> |
Co-Benefits

**Economic**
- Reduced utility cost of government budget
- Increased energy security from demand-side reductions
- Increased market demand for energy efficiency products and business
- Increased productivity from a greener and healthier work environment

**Environmental**
- Reduced GHG emissions from reduced electricity generation
- Reduced use of water and other natural resources
- Improved government building environment

**Social**
- Positive health effects from better air quality
- Job creation and economic development
- Capacity building and skills development
• Lunched since 2008
• Criteria for Green Products and Services
  – Description
  – Environmental Impacts
  – Selection Principle
    • Impacts of Product Life Cycle
    • Resource Efficiency
    • Ease of Replacement
    • Plentiful Purchasing
  – Evidence or Label of Standard
• 17 Products: Computer Paper, Coloured Paper, Correction Liquid, Toilet Paper, Fluorescent Lamp, Primary Battery, Document Box, Photocopier, Printer, Metal Equipment, Envelope, Toner Cartridge, Whiteboard Pen, Paints, Car, Lubricant Oil, Fuel
• 5 Services: Petrol Station, Car Services, Hotel, Cleaning Services, Photocopier Rental
Label no.5

- Launch since 1993
- 27 Product i.e. Refrigerator, Air-conditioning, Microwave oven, Washing machine, Electric fan, Electric kettle, Fluorescent bulb, Iron, Water heater, LED bulb, etc.
- Mobile Application
Market Mechanism

Green Housing Pilot Projects
- Patum Thani
- Si Sa Ket
- Rayong

Public Green Building
- Green Public Procurement

Communication

Supply

Demand
Thank you

Climate Change Management and Coordination Division
Office of Natural Resources and Environmental Policy and Planning
www.onep.go.th