



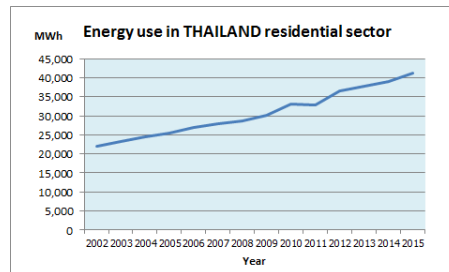
NAMA Seeking Support for Implementation

A Overview

A.1 Party Thailand

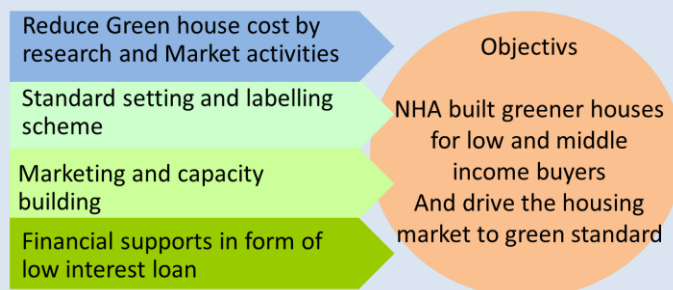
A.2 Title of Mitigation Action Greening Thailand’s Low Income Housing

A.3 Description of mitigation action The building sector is a significant contributor to Thailand’s greenhouse gas emissions. The housing sector, in particular, consumed 24% of the electricity used in Thailand in 2015. With 5.0 % rate of growth of residential buildings due to urbanisation and increased demand for housing due to shifting demographics.



This NAMA involves a collaboration between the National Housing Authority (NHA) and Electricity Generating Authority of Thailand (EGAT) to apply “Ecovillage”+”Label 5” standards for new low income housing projects in Thailand. The NAMA will address the design aspects of new residential buildings, including materials; energy and water efficient appliances; research; and market stimulation to lower the cost of green residential construction. The NAMA will include a demonstration site, capacity-building, MRV, and dissemination of design standards.

NAMA Activities in 5 years



The actions proposed in this NAMA will support Thailand’s INDC of 20% emissions reduction from BAU by 2030. It is also



in line with Thailand's national goal of reducing energy intensity by 30% by 2036, compared to 2010 levels.

- A.4 Sector
- | | |
|--|--|
| <input type="checkbox"/> Energy supply | <input type="checkbox"/> Transport and its Infrastructure |
| <input checked="" type="checkbox"/> Residential and Commercial buildings | <input type="checkbox"/> Industry |
| <input type="checkbox"/> Agriculture | <input type="checkbox"/> Forestry |
| <input type="checkbox"/> Waste management | <input type="checkbox"/> Other <Pls enter Other text here> |

- A.5 Technology
- | | |
|---|--|
| <input type="checkbox"/> Bioenergy | <input type="checkbox"/> Cleaner Fuels |
| <input checked="" type="checkbox"/> Energy Efficiency | <input type="checkbox"/> Geothermal energy |
| <input type="checkbox"/> Hydropower | <input type="checkbox"/> Solar energy |
| <input type="checkbox"/> Wind energy | <input type="checkbox"/> Ocean energy |
| <input type="checkbox"/> Carbon Capture and Storage | <input type="checkbox"/> Low till / No till |
| <input type="checkbox"/> Land fill gas collection | <input type="checkbox"/> Other <Pls enter Other text here> |

- A.6 Type of action
- | |
|---|
| <input type="checkbox"/> National/ Sectoral goal |
| <input type="checkbox"/> Strategy |
| <input checked="" type="checkbox"/> National/Sectoral policy or program |
| <input type="checkbox"/> Project: Investment in machinery |
| <input type="checkbox"/> Project: Investment in infrastructure |
| <input type="checkbox"/> Project: Other |
| <input type="checkbox"/> Other: <Pls enter Other text here> |

- A.7 Greenhouse gases covered by the action
- | | |
|---|--|
| <input checked="" type="checkbox"/> CO ₂ | <input type="checkbox"/> CH ₄ |
| <input type="checkbox"/> N ₂ O | <input type="checkbox"/> HFCs |
| <input type="checkbox"/> PFCs | <input type="checkbox"/> SF ₆ |
| <input type="checkbox"/> Other <Pls add in text here> | |

B National Implementing Entity

- B.1.0 Name 1. National Housing Authority (NHA)
2. Electricity Generating Authority of Thailand (EGAT)
- B.1.1 Address National Housing Authority, 908 Nawamin Road, Klongchan, Bangkok
Bangkok 10240, Thailand.
- B.1.2 Contact Person Ms Sureeporn Suwannaworn
Alternative Contact Person Ms. Pornuma Harabuttra
- B.1.3 Phone Tel. +66 2351 6859, +6686 069 6786
Alternative Phone Tel. +66 24368133, +6685 910 0713
- B.1.4 Email ws55_5@hotmail.com
Alternative Email pornuma.h@egat.co.th

C. Expected timeframe for the implementation of the mitigation action

- C.1 Number of years for completion 5
- C.2 Expected start year of implementation 2018



D.1 Used Currency Thai Baht
Conversion to USD 35 Baht = 1 USD

E Cost

E.1.1 Estimated full cost of implementation 31,936 MBaht
Conversion to USD <912.46m>

E.1.2 Comments on full cost of implementation

The implementation cost corresponds to the construction cost of standard low and middle-income Houses in NHA plan for 5 years (2018-2022) as shown in the table 1 below. The construction costs are based on total number of residential units (58,043), and the unit cost of each building type. The budget for full implementation cost will come from NHA and government support.

The details shown in “cost & potential worksheet” Table 1 shows the targeted number of residential units per year of implementation:

Type of house/ Year of completion	2020	2021	2022	Total
Single House	4,232	1,748	2,502	8,482
Twin House	1,196	680	1,546	3,422
Row House	2,168	1,045	1,806	5,019
Condominium	5,986	4,779	8,533	19,298
Total	15,602	10,273	16,409	36,221

E.2.1 Estimated incremental cost of implementation 515.41 MBaht
Conversion to USD <14.7m>

E.2.2 Comments on estimated incremental cost of implementation

The incremental cost of implementation includes additional cost to become “green.” The incremental cost will come from local fund such as Energy Conservation Fund (ENCON Fund) and potentially received NAMA funding.

F Support required for the implementation of the mitigation action

F.1.1 Amount of financial support 257.70 MBaht
Conversion to USD <7.36m>

F.1.2 Type of required financial support

- Grant
- Loan (sovereign)
- Loan (Private)
- Concessional loan
- Guarantee
- Equity
- Carbon finance
- Other <Pls enter Other text here>

F.1.3 Comments on Financial Support: the financial support will combine with other Government fundings to raise a Green climate fund which lend money to home buyers. The interest payments from loan will continue the funding.



F.2.1 Amount of Technological Support 111.25 MBaht
Conversion to USD <3.18 m>

F.2.2 Comments on Technological Support : the support is needed for developing Green building criteria for housing units and implementation plans and financial mechanisms to support green housing market. The activities includes
1 Criteria Development for Energy Efficient Household labelling
2 MRV design and baseline data collection
3 Enhancement of eco-village criteria
4 Scale up strategic and implementation plans for eco-village criteria
5 Financial mechanism development
6 Study of eco-friendly materials, construction and intervention plans

F.3.1 Amount of capacity building support 87.5 MBaht
Conversion to USD <2.5 m>

F.3.2 Type of required capacity building support Individual level
 Institutional level
 Systemic level
 Other <Pls enter Other text here>

F.3.3 Comments on Capacity Building Support : the support is needed for capacity building of all stakeholders and awareness raising such as
1. Training for green building architects, engineers, and contractors, including the usage of Standards and certification system.
2. Training for certified green building auditors.
3. Training MRV tools.
4. Media and campaign for Greenhousing label to market.

F.4 Financial support for implementation required

F.5 Technological support for implementation required

F.6 Capacity building support for implementation required

G Estimated emission reductions

G.1 Amount 304,256 ton.

G.2 Unit tCO2e

G.3 Additional information: the estimated emission reduction is based on savings from Building Energy Code Software Program comparing energy use of typical design of low-income houses with certified green houses with 5 energy efficiency measures. The energy savings and total emissions reduction are calculated from actual survey data and the number of housing units of NHA plan during next 5 years.

H.1 Other indicators of implementation

1. Develop a green building labelling scheme in line with Ecovillage, to be accredited and launched by EGAT ,and market this scheme.
2. Number of new low and middle income houses developed by NHA achieve green label accreditation.
3. Develop MRV framework for collection and reporting of operational energy use in



buildings.

4. Cost of Green houses compared to those of standard houses.
5. Number of houses and amount of money supported by the program.
6. Number of personnel trained for the green building industry.

I.1 Other relevant information including co-benefits for local sustainable development

Economic: (1) Reduced electricity bill for low-income families; (2) Increased energy security from demand-side reductions; (3) Increased green material and technology demand; (3) lower market cost of green houses; (4) Promote green house market demand .

Environmental: (1) Reduced GHG emissions from reduced electricity generation; (2) Reduced use of water and other natural resources; (3) better quality of life.

Social: (1) Welfare gains from reduced electricity bills, especially for the lower income population; (2) Positive health effects from better air quality; (3) Job creation and economic development; (4) Capacity building and skills development.

J Relevant National Policies strategies, plans and programmes and/or other mitigation action

J.1 Relevant National Policies Energy Efficiency Plan (2015-2036)
 Thailand Climate Change Masterplan (2011-2050)

J.2 Links to other mitigation actions <Pls enter/select NAMA ID>

K Attachments

K.1 Attachment description the attachment includes 4 sheets:
 -Project cost and potentials
 -Project Budget
 -Project plan
 -Project organization chart

K.2 File Project_cost_and_potential.pdf
 Project_budget.pdf
 Project_plan.pdf
 Project_organization_chart.pdf

L Support received

L.1 From outside the Registry -the construction budget from NHA and government
 -the incremental cost from government fund

.2 From within the Registry

Source	Amount	Date

1. <http://www.eppo.go.th/index.php/th/component/k2/item/11342-energy-statistics-2559> ,Energy report,EPPO,Ministry of energy.