Context

The government of Thailand legislated a law called Energy Conservation Promotion Act (ECP Act) in 1992. A set of by-laws identifying designated buildings (DBs) and detailing mandatory requirements for energy conservation for DBs were enacted in 1995.

First revision of ECP Act was in 2003 with minor changes and the second revision in 2007 with major changes (ECP Act, BE 2550-2007). The implementation of the Building Energy Code (BEC) on newly built buildings (floor area > 2,000 m²) started in 2009.

Objective

National priorities for buildings energy efficiency are that BEC will decrease energy consumption in commercial & residential buildings by 6800 ktoe in 2030 and 10700 ktoe in 2036 equivalent to 23% of the total primary energy consumption.

The strategic objective of the country is to Promote Energy Conservation seriously for Energy security.

Programme description

Main characteristics

The Ministry of Interior via the Building Control Committee and the Central Local Authorities are in charge of implementation of the code.

The code continues to adopt system performance requirements for building envelope, lighting, and air-conditioning. Moreover, the code provides credit for use of solar energy, and introduces a new option of whole building energy compliance. A reference building model of the same shape, same floor area, same envelope area and same orientation is set up when the whole building energy compliance option is required. The Overall Thermal Transfer Value (OTTV) has been adopted by the code. The OTTV formulation represents the average heat gain through a given building envelope for a whole year.

A new building with floor area exceeding 10,000 m², designated as very large buildings (NVLB) under Building Control Act, must comply with requirements on building envelope, lighting, and air-conditioning before its design is approved for construction. For a new building with an area between 2,000 and 10,000 m², designated as large building (NLB), its building envelope must comply with the requirements on building envelope. These are consistent with the present bye-law of the Building Control Act that requires that building design and electrical and mechanical designs of a very large building be submitted for construction permission. For a large building, the bye-law requires only building design to be submitted.

The code is mandatory. Type of enforcement: Local enforcement, inspection.

On-site Inspections: Post completion.

Penalties for Non-compliance: Refusal of permission to occupy, Refusal of permission to construct.

Measures Supporting Enforcement: Commissioning requirements, Airtightness
testing required prior to compliance, Mandatory Computer Modeling and Training of Inspectors.

**Impact/evaluation**

**Market transformation**

Thailand’s green building and energy efficiency construction sector, which may need $13bn in spending over the next two decades, is looking toward better certification standards and government incentives to drive growth. Figures released by the Department of Alternative Energy Development and Efficiency (DEDE) show that $7bn was spent on energy efficiency between 2003 and 2011, highlighting the growing awareness of sustainability and conservation within Thailand in recent years.

Increasingly, however, local industry stakeholders are establishing their own green standards, often in collaboration with government agencies. In Thailand, green developers will soon be able to choose among three different local green building codes that conduct comprehensive assessment and certification. The Thai MOE, in partnership with Chulalongkorn University, runs the Thailand Energy & Environmental Assessment Method (TEEM). TREES or Thai's Rating of Energy and Environmental Sustainability green building rating system has been developed by Thai Green Building Institute implemented in 2012.

By auditing and rating buildings’ energy efficiency and environmental friendliness, certification systems provide a common point of reference for investors, developers and end-users to value green buildings.

**Energy savings**

The cumulative expected energy savings from the year 2008 to the year 2016 is to be 8,270 GWh without promotion scenario and 21,200 GWh with promotion scenario.

The building code – according to the Asia Pacific Energy Research Centre (APERC) – requires only about a 5-10% reduction in energy use. With many green buildings and retrofits reaching energy reductions of 30-50% – a target the UN Environmental Programme (UNEP) identifies as attainable with “proven and commercially available technology” – Thailand’s building bylaws have not yet driven a major shift to greener buildings.

**Perspectives**

Alternative Energy Development Plan, AEDP (2012-2021): this plan supports researches, developments and promotions of Thailand renewable energy technologies. It targets Renewable energy increasing from 7,413 ktoe in 2012 to 25,000 ktoe in 2021 (25% of total energy consumption).

Energy Efficiency Development Plan, EEDP (2011-2030): EEDP was approved by the National Energy Policy Council (NEPC) on 30 November 2011. This plan targets on 25% reduction of energy intensity (ratio of energy consumption to GDP) of the country within 20 years (2011-2030).

The Government has revised EEDP 2011-2030 to Strategic EEDP 2015-2036 in November 2014. The EEDP and AEDP expect for buildings:

- Development of mandatory building energy efficiency labeling for new government Buildings.
- Development of compulsory mechanism for large commercial building to install solar hot water system
- Support for voluntary building energy-efficiency labeling
- Encourage home energy labeling, particularly in the housing
- Encourage the use of high energy-efficiency equipment/appliance, e.g. CFL, high efficiency LPG stoves, etc
- Support the construction of demonstration buildings to be energy-saving building prototypes (e.g. government buildings)
- Promote R&D on high energy-efficiency equipment/appliances, e.g. LED light bulbs, heat-pump water heaters, etc.
- Promote installation of solar cooling/ heating systems (e.g. government buildings)
- Support the design and construction of demonstration of energy-saving homes
- Develop a low-cost solar water heating system for household application
- Promotion of the development of professionals in building energy efficiency and in building design inspection

Problems / adaptations

In implementing the Ministerial Regulations that embody the building energy code, limited success has been observed. This unfortunate situation stems from the way the law was applied and the deficiency in the code itself.

The code does not provide direct linkage between energy performance of different systems in a building to energy consumption and energy cost of the building. Moreover, the code tends to mislead industry participants to taking the code requirements as ultimate targets, while the performance requirements were meant to be minimum requirements at the onset. The detailed requirements in the existing code are also subject to review since its requirements were made based on technologies prevailing close to more than one decade ago.

Enforcement also remains an obstacle, with a significant gap between legal requirements and actual performance.

Jurisdictional conflicts exist between the Department of the Interior and the Department of Energy, which are each tasked with enforcing different parts of the building code.

Accompanying measures

The Energy Conservation Promotion Fund ENCON Fund was created by the ECP Act to facilitate implementation of activities sanctioned by the act. The ENCON Fund has been used to fund energy audits carried out by consultants on all DBs. This gave rise to considerable expectation of systematic and progressive execution energy conservation activities. Unfortunately Thailand had not witnessed efforts that match its expectations.

Revolving Fund Project for Energy Conservation was created (Low interest loan). ESCO Fund and Tax Incentive measure are also created (100% of energy saving can be used for tax exemption).

A Building Energy Code Training & Consulting Center was open in 2009 at the Ministry of Energy that provides the following services:
- evaluate building blueprint for compliance of building energy code
- provide consultation and advice regarding energy-efficient building design
- provide information and knowledge on energy-efficient building design and related regulations
- release useful news and information to users via a website.

References

www.2e-building.com