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ENERGY EFFICIENCY IN BUILDINGS

Vietnam

STATUS AND TRENDS

In the past two decades, Vietnam has been experiencing rapid economic growth, with GDP growing by 6.8 percent in 2017. Economic growth has resulted in significant improvement in the quality of the people's lives and poverty reduction. In 2015, Vietnam became a net energy importer with an import share of energy at 5%, which is expected to grow. By 2035, total final energy demand is estimated to increase by 2.5 times from the level of 54 Mtoe in 2015 (see Figure 1).

Buildings play a very important role in improving energy efficiency in the country, with 30% of final energy consumption being attributed to this sector in 2015 (see Figure 1). Sustainable practices in buildings are present at a small scale, having been implemented in only 3% of buildings, according to the Vietnam Green Building Council.

Residential buildings account for the largest share of energy consumption within the building sector with the highest consuming end-uses being lighting (19%) and air-conditioning (17%). The average energy intensity for residential buildings in cities is estimated at around 60 kWh/m²/year. In the commercial sector, average energy intensities vary greatly depending on the building type, with administrative and hospital buildings demonstrating specific energy use at around 50 kWh/m²/year, while that for hotels and retail buildings exceeds 200 kWh/m²/year. Air-conditioning is responsible for more than half of the sub-sector's energy consumption, reaching up to 75% of the total energy consumption in hotel (Deringer 2016).

In the past decade, urbanization (urbanization rate increased from 28% in 2006 to 34% in 2016) and population growth have been driving floor area growth particularly within the segment of medium and large-size buildings. For example, in 2013 alone, the gross housing area has increased by 79 million m² nation-wide. According to the Ministry of Construction, the average annual growth rate of the total floor area of commercial and residential buildings is between 6-7%.

Such dynamics within the building sector make policies on energy efficiency in buildings crucial for achieving the country's mitigation commitments and avoiding the lock-in of high energy consumption through construction of buildings with low or moderate energy performance.

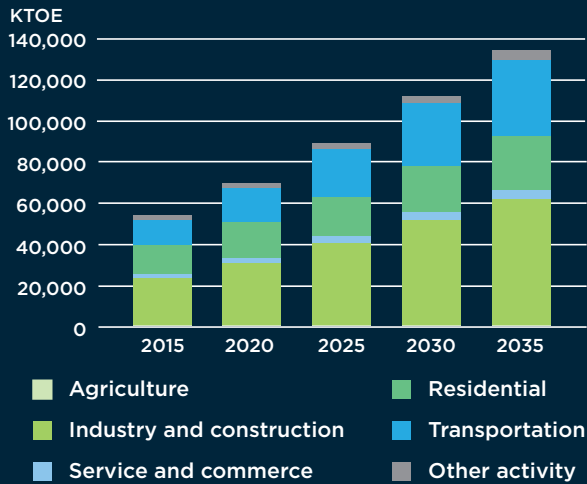


KEY INDICATORS

- 91.7 million people
- GDP at PPP (2010): USD 509bn
- Primary energy intensity 0.14 toe/ thousand 2010 USD
- Greenhouse gas emissions: 1.8 tCO₂/capita

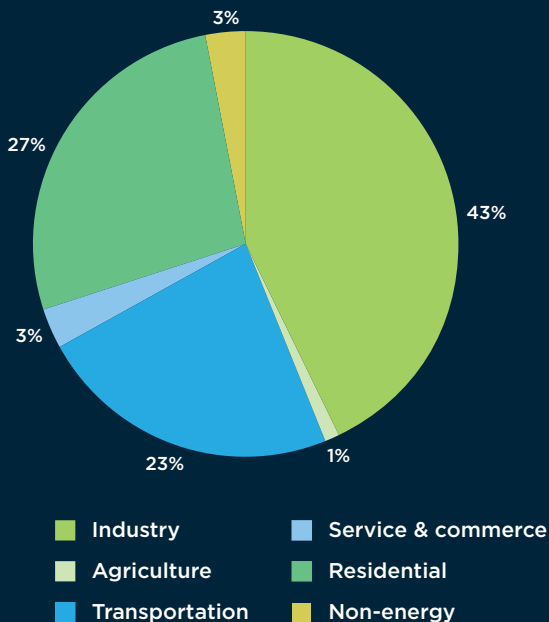
Source: IEA (2015)

Figure 1: Forecast of final energy demand by economic sector



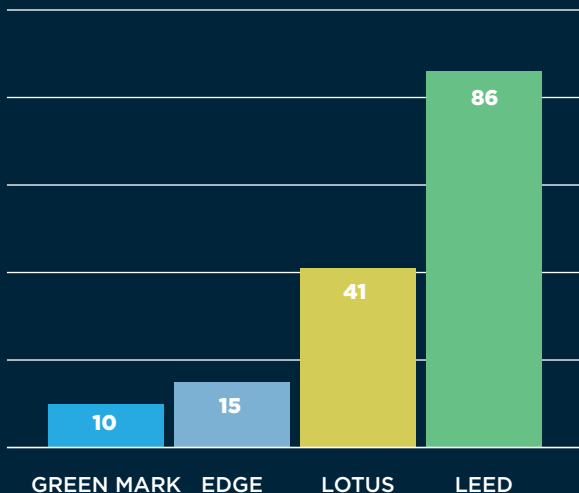
Source: DEA (2017)

Figure 2: Final energy consumption in 2015 (total 54,120 million toe)



Source: DEA (2017)

Figure 3: Number of registered buildings in Vietnam by scheme as of end of 2017



INSTITUTIONAL FRAMEWORK

Responsibilities for improving building energy efficiency in Vietnam are shared among a number of different institutions:

- The Ministry of Industry and Trade (MOIT) is in charge of activities related to the energy sector and other industries: the state management of all energy industries, and the development of regulation, policies, strategies, master plans and annual plans for those sectors. MOIT is also the focal point of Energy Efficiency and Conservation (through its EE&C Office) and chairs the National Steering Committee to monitor implementation of the Vietnam National Energy Efficiency Program (VNEEP).
- The Ministry of Construction (MOC) is responsible for the development of general construction plans for inter-provincial new urban areas, high-technology areas, and specialized economic zones; a number of activities on energy efficiency in the building sector are shared between MOC and MOIT.
- The Ministry of Planning and Investment sets the Socio-economic Development Strategy and Plan, coordinates the distribution of economy-wide capital investment among projects submitted by ministries and agencies, and distributes foreign direct investments.
- The Ministry of Finance has jurisdiction over tariffs and taxation related to energy activities.
- The Ministry of Natural Resources and Environment (MONRE) plays an important role in research and development in the field of energy and environmental protection and related projects.
- Local authorities have responsibility over construction activities within their territories as assigned by the Government. Depending on the type of building, the responsibility for development of construction plans and for issuing construction licenses falls under the jurisdiction of provincial, district-level and communal People's Committees. At each institutional level, responsibilities over the building sector are shared between the MOIT, MOC and MONRE. The Provincial people's committees are also in charge of development and implementation of VNEEP as a part of provincial social economic development planning.

Overall, the governance of the energy sector is fragmented and coordination between public agencies is limited, as there is a lack of a central agency to monitor the performance of agencies in their enactment of policies (Thach 2014). The national government does not have a strong existing regional presence relying on steering committees, which further raises issues regarding the inter-level coordination of public agencies (Gilfillan, Nguyen, and Pham 2017). External actors typically involved in the implementation of international projects (e.g. the World Bank and GIZ) also contribute to strengthening the coordination between sectors and ministries (Vieira 2017).

POLICY FRAMEWORK

The Government of Vietnam has recognised that fast economic growth has to go hand in hand with accelerated efforts on sustainable development and social inclusion, and that energy efficiency is an important contributor to multiple facets of this agenda. A number of policy instruments support energy efficiency improvement at the national level:

- Vietnam National Energy Efficiency Program (VNEEP) – a ten-year plan to achieve economy-wide savings (5-8% by 2015 compared with 2006);

- ‘Vietnam National Green Growth Strategy’ (2012), which establishes a Green Growth Fund, greenhouse gas emission reductions targets and a roadmap for development from 2012 to 2050;
- Law on ‘Economical and Efficient use of Energy’, which promotes energy efficiency measures across the key sectors and sets out the state’s responsibilities for their implementation
- National Action Plan to Respond to Climate Change in 2012-2020, which sets the objectives of the National Strategy of Climate Change and consists of 65 programs, projects and tasks, with 10 priorities. Under this Plan “National target program on energy use and efficiency” is to be implemented by the Ministry of Industry and Trade (Nguyen 2012).

Vietnam’s Nationally Determined Contributions (NDC) to the Paris Agreement on Climate Change aim at reducing country-wide GHG emission by 8% by 2030 compared to the Business as Usual scenario with utilisation of domestic resources, and by 25% with the use of the international support. Energy efficiency is recognised as an important mitigation strategy, covering the areas of energy production, transmission and distribution (especially for large production facilities), residential sector, trade and services as well as transport.

In September 2013, the Ministry of Construction adopted the National Energy Efficiency Building Code QCVN 09:2013/BXD (VEEBC), which set mandatory technical standards to achieve energy efficiency during the design, construction or retrofit of civil buildings (office buildings, hotels, hospitals, schools, commercial buildings, services buildings, apartments buildings, among others), with a gross floor area of 2,500 m² or larger. VEEBC was updated in 2017 (Ministry of Construction Vietnam 2013).

Currently there are no mandatory certification schemes for buildings in Vietnam, though several voluntary programs are present, with internationally well-known LEED being most prevalent.

In 2017, there were around 150 Green Building projects registered under various certification schemes in the country (Figure 3), with the majority of them concentrated in the industrial sector (BlueScope 2017).

The LOTUS Certification system for buildings was developed in 2010 specifically for the Vietnamese context by the Vietnam Green Building Council (VGBC), covering most of the non-residential and residential building types.

LOTUS shares a number of similarities with LEED, Green Mark and other systems developed by other members of the World Green Building Council, including a point-based system, a list of prerequisites and credits with similar intents and requirements. The number of points earned determines the LOTUS Certification level of projects. There are four levels of certification benchmarked at 40% (LOTUS Certified), 55% (LOTUS Silver), 65% (LOTUS Gold) and 75% (LOTUS Platinum) of the total number of points available (VGBC 2017).

The International Finance Corporation (IFC) launched its green-building certification program EDGE in Vietnam in 2015. EDGE aims to help developers reduce their buildings’ energy and water consumption by 20 percent while lowering greenhouse-gas emissions (VGBC 2013).

INTERNATIONAL SUPPORT

VEEBC design and implementation are key for energy efficiency improvement in Vietnam’s building sector and crucial for the policy development in the sector.

In 2016, Pacific Northwest National Laboratory (PNNL) provided the following key recommendations for the revision of VEEBC (Halverson and Evans 2016):

1. Decreasing the size limit of buildings, for which compliance with the VBEEC is required. The VBEEC currently requires compliance for buildings over 2500 square meters, while most Vietnamese buildings fall under this threshold. Lowering the threshold gradually with a planned schedule will help adjust market expectation.
2. Addressing how (if) renovations, additions, operations, and maintenance are to be covered in the VBEEC.
3. Revising the lighting equipment performance requirements to disallow incandescent lighting and magnetic ballasts.
4. Revising the lighting controls section to expand the areas in which occupancy controls are required.

IFC as well as the Danish government (DEA 2014) are promoting training on building code implementation, while VGBC are taking steps to move beyond the building code and to promote high energy performing buildings (30-50% more efficient than the current Code) throughout Vietnam.

In 2017, the USAID Vietnam Clean Energy Program, implemented by Winrock International, launched the first Green Growth Action Plan (GGAP) for the Vietnam construction sector, which was developed jointly with the Vietnam Ministry of Construction to strengthen the foundation for low-emissions energy systems in Vietnam’s construction sector (VCEP 2015). Under the Vietnam Clean Energy Program, local authorities receive technical support and training to improve data management, collection and analysis capability in construction, encompassing power usage in office buildings, hospitals, hotels, apartment buildings, schools and commercial buildings. If these measures are implemented they will help save about 10-15% of the energy use (VNEEP 2014).

A UNDP project ‘Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings in Vietnam’ (2016-2019) aims at reducing intensity of GHG emissions from the building sector in the country. The project objective is to improve the energy performance of commercial and high-rise residential buildings in Ho Chi Minh and Hanoi through (1) improvement and enforcement of VEEBC; (2) building market development support initiatives; and (3) building energy efficiency technology applications and replications (UNDP 2016).

U.K.’s International Climate Fund (ICF) funded a project “Vietnam 2050 Pathways Calculator” with the focus on development of an innovative web-based computer model, showing Vietnam’s energy demand and supply and their interaction with the country’s greenhouse gas emissions (Da Nang 2018).



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