

MALAYSIA

1. GOALS ON EFFICIENCY IMPROVEMENT

1.1. Overall energy efficiency improvement goals

Various efforts have been undertaken by the Malaysian Government to utilize energy efficiently. A number of key energy efficiency programs were initiated in the Eighth Malaysia Plan (2001 to 2005). This plan aimed at strengthening the Utilization Objective of Malaysia's Energy Policy (1979), which sought to promote the efficient utilization of energy and the elimination of wasteful and non-productive patterns of energy consumption. The Ministry of Energy, Green Technology and Water (MEGTW) is now finalizing a National Energy Efficiency Action Plan (NEEAP), with clear goals to coordinate and implement energy efficiency and energy conservation. Scheduled to be implemented in 2016, the National Energy Efficiency Action Plan aims to reduce electricity consumption by 8% (compared to business-as-usual (BAU)) by the tenth year.

The NEEAP initiatives include the following:

- a) Promotion of five-star energy-efficient appliances (air conditioners, refrigerators, and lamps).
- b) Energy audits and management in the government, industrial, and commercial sectors.
- c) Introducing MEPS for electric motors.
- d) Promotion of cogeneration.
- e) Promotion of the ISO 50001 standard for energy-efficient buildings.

1.2. Sectoral energy efficiency improvement goals

There are no specific sectoral targets.

1.3. Action plans for promoting energy efficiency

The Economic Transformation Programme (ETP) identified a few national key economic areas (NKEAs) in order to achieve a high-income economy by 2020. An Entry Point Project (EPP) on energy efficiency was designed under the oil, gas, and energy NKEAs that is known as EPP9: Improving Energy Efficiency. It is also known as the Sustainability Achieved via Energy Efficiency (SAVE) program that focuses on the following initiatives:

- a) Government leading by example
 - To promote and implement efficient energy management systems and practices in government buildings.
- b) SAVE Program:
 - The SAVE program focuses on increasing sales of energy-efficient appliances by offering rebates for five-star rated appliances.
 - Rebates for the purchase of efficient five-star rated refrigerators (100,000 units) and air conditioners (65,000 units) are offered to domestic users, while rebates for replacing energy-efficient chillers (72,000 refrigerant tons) are offered to private commercial building owners.
- c) Promotion of building insulation.

- d) Promotion of more economically viable cogeneration for industries.
- e) Efficiency in transport by energy-efficient vehicles.

Objectives:

Energy efficiency measures will be intensified to harness energy savings potential and reduce Malaysia's carbon emissions and dependence on fossil fuels. Intrinsic barriers to energy efficiency that pose challenges in capturing this opportunity will also be addressed.

a) Applicable sectors:

Buildings, industrial, and transport.

b) Outline:

- a) Phasing out incandescent light bulbs.
- b) Increasing energy performance labeling from four to 10 electrical appliances.
- c) Introducing guidelines for green townships and rating scales according to carbon footprint baselines.
- d) Increasing the use of energy-efficient machines and equipment, such as high-efficiency motors, pumps, and variable speed drive controls.
- e) Introducing minimum energy performance standards (MEPS) for selected appliances. Regulations to enforce MEPS in Malaysia were gazetted on May 3, 2013. Five domestic electrical appliances, namely, air conditioners, refrigerators, TV sets, domestic fans, and lamps were subject to MEPS requirements before the products could be sold in the market. The MEPS value for Malaysia has been set at a two-star rating.
- f) Revision of the Uniform Building By-Laws to incorporate the Malaysian Standard: Code of Practice on Energy Efficiency and Renewable Energy for Non-Residential Buildings (MS1525).
- g) Wider adoption of the Green Building Index.
- h) Increasing the use of thermal insulation for roofs in air-conditioned buildings.

c) Financial resources and budget allocation

The SAVE program was created and administered by the MEGTW and funded by the government in the Economic Transformation Program (ETP) with RM 44.3 million allocated for rebates and promotional campaign activities. The budget should cover the purchases of up to 100,000 refrigerators, 65,000 air conditioners, and 72,000 energy-efficient chillers for eligible domestic consumers and private companies. The total energy saved from this equipment for 2011-2013 was 306.9 GWh, while avoiding the emissions of 208,705 tons of CO₂.

d) Method for monitoring and measuring the effects of action plans

The progress and achievement is monitored through an outcome-based assessment method. The assessment report is prepared twice (at half way and at the end of the plan). The reports will be submitted to the Economic Planning Unit of the Prime Minister's Department.

e) Achievements

• Industry

- a) The Efficient Management of Electrical Energy Regulation 2008 is formulated under the Electricity Supply Act. Under the regulation, all installations that consume three million kWh

or more of electricity over a period of six months will be required to employ an energy manager to analyze the total consumption of electricity, advise on measures to improve energy efficiency, and monitor the effectiveness of the measures taken.

- b) The Energy Efficiency and Conservation Guidelines Part 1: Electrical Energy-use Equipment: The guidelines have been framed to encourage industries to adopt energy-efficient practices as well as manage and improve their energy utilization and environmental management.
 - c) The Energy Efficiency and Conservation Guidelines Part 2: Thermal Energy-use Equipment: The guidelines are to encourage industries to adopt energy-efficient practices as well as manage and improve their energy utilization and environmental management.
 - d) The Industrial Energy Audit Guidelines: The guidelines are based on 54 energy audits in eight energy-intensive industrial subsectors, namely, iron and steel, cement, wood, food, glass, pulp and paper, ceramics, and rubber, which were carried out under the Malaysian Industrial Energy Efficiency Improvement Project (MIEEIP).
 - e) Energy-use benchmarks for eight energy-intensive industrial subsectors, namely, iron and steel, cement, wood, food, glass, pulp and paper, ceramics, and rubber.
 - f) Increasing the use of energy-efficient machines and equipment, such as high-efficiency motors, pumps, and variable speed drive controls.
 - g) Introduction of Minimum Energy Performance Standards (MEPS) for selected appliances in order to restrict the manufacture, import, and sale of inefficient appliances to consumers.
 - h) To accelerate the transformation of the consumer appliances market in order to increase the share of energy-efficient models, phase out inefficient models from the local market, and reduce the price premium for energy-efficient products.
 - i) To introduce the MEPS for selected equipment, such as motors, chillers, cooling towers, and compressors. Currently, the development of a standard for motors is underway.
- **Building**
 - a) Energy efficiency requirements under the MS1525, which is the Code of Practice on the Use of Renewable Energy and Energy Efficiency in Non-Residential Buildings, were incorporated in the amendments to the Uniform Building By-Laws (UBBL).
 - b) The wider adoption of the Green Building Index to benchmark energy consumption in new and existing buildings.
 - c) Increasing the use of thermal insulation for roofs in air-conditioned buildings in order to save energy.
 - d) In 2010, the MEGTW also launched the "Government Leads by Example" (GLBE) initiatives to encourage energy-efficient practices and ensure the productive use of energy while minimizing waste within the public sector. The MEGTW also conducted energy audits and performed retrofitting in selected government buildings. This initiative is being carried out to more government buildings since 2015.

- e) The introduction of a circular regarding no-cost measures for implementing energy efficiency by setting the temperatures of all government buildings to be no lower than 24 degrees Centigrade. This was one of the efforts undertaken to demonstrate the government's commitment in reducing overall electricity consumption in an easy and cost-effective manner.
- f) Energy Performance Contracting (EPC) was launched in January 2013 to promote energy efficiency in the government. Under the EPC concept, government buildings are allowed to engage energy services companies (ESCOs) to improve energy efficiency. This initiative can help develop an ESCO industry in Malaysia.
- g) In 2014, the government took another step under the GLBE initiatives by monitoring the electricity consumption of 25 ministry buildings. Such actions were expected to reduce their total electricity consumption by 5% in 2014 (compared to the previous year).
- h) The government also expanded the GLBE initiatives by implementing two new initiatives under the 2014 budget. The initiatives include solar panel installations on the rooftops of selected government buildings and the installation of LED lights in selected ministry buildings, both of which are ongoing projects.

- **Residential**

- a) Dissemination of information and awareness to create a voluntary behavioral shift in residential energy users.
- b) Increasing MEPS and labeling from five (air conditioners, refrigerators, TVs, fans, and lamps) to 11 electrical appliances with the six additional appliances including rice cookers, electric kettles, washing machines, microwaves, clothes dryers, and dishwashers.
- c) Phasing out incandescent light bulbs by 2014 to reduce carbon dioxide emissions by an estimated 732,000 tons and energy usage by 1,074 gigawatts a year.
- d) Under the SAVE program, a rebate of RM100 to RM200 is offered to domestic consumers to purchase refrigerators and air-conditioning units that are energy efficient (five-star rated).

- f) **Future tasks**

To carry out energy efficiency projects under the Eleventh Malaysia Plan (RMK-11), which covers the industrial sector as well as commercial and government buildings. The projects are aimed at creating an energy-efficient community in which both the deployment of technology and capacity building are given priority.

1.4. Institutional structure

a) Name of organization

The key agencies involved in energy efficiency include the following: the Energy Section of Economic Planning Unit (EPU) of the Prime Minister's Department, the Ministry of Energy, Green Technology and Water (MEGTW), the Energy Commission (EC), and the Sustainable Energy Development Authority (SEDA Malaysia).

b) Status of organization

All agencies perform their duties for the central government.

c) Roles and responsibilities

The role of the MEGTW is to formulate an energy efficiency policy, in coordination with the EPU. The EPU provides the general direction, strategies, and determines the level of implementation, while the EC is the regulatory agency for the electricity and piped gas supply industry. The commission's main tasks are to provide technical and performance regulations for the electricity and piped gas supply industry (as the safety regulator for electricity and piped gas) and advise the minister on all matters related to electricity and piped gas supply, including energy efficiency and renewable energy issues. SEDA Malaysia is the executing agency for the Entry Point Project (EPP) on energy efficiency.

d) Covered sectors

Industrial, building, residential (appliances), and government sectors.

e) Established Date

The MEGTW was established in April 2009. It was formerly known as the Ministry of Energy, Water and Communications in 2004 and the Ministry of Energy, Communications and Multimedia in 1998. The EC was established in 2001 after replacing the Department of Electricity and Gas Supply (DEGS). SEDA Malaysia was established in September 2011.

f) Number of Staff

There are five officers in the MEGTW in charge of renewable energy and energy efficiency, 11 officers in the EC who handle energy efficiency matters, and 12 officers in SEDA Malaysia who deal with renewable energy with one officer in charge of energy efficiency.

1.5 Information dissemination, awareness raising, and capacity building

A large number of information-dissemination seminars and workshops have been held for energy users by organizations involved in promoting energy efficiency. The government has successfully implemented various activities related to renewable energy and energy efficiency through mass media, competitions, and exhibitions. Capacity-building programs, such as the Promotion of Energy Efficiency and Conservation (PROMEEC) or Energy Management and ASEAN Energy Management Accreditation Scheme (AEMAS), has been successfully conducted by energy auditors, energy managers, and various government agencies in order to gain knowledge of efficient energy management in their own premises, while recognizing the vast business opportunities that lie ahead.

1.6 Research and development in energy efficiency and conservation

Technical research on energy efficiency and conservation are mainly conducted by government-sponsored universities. The research is funded by the government through the Ministry of Science, Technology and Innovation.

2. MEASURES FOR ENERGY EFFICIENCY IMPROVEMENTS

2.1. Government laws, decrees, and acts

a) Name

Electricity Supply Act 1990 and the Electricity Supply Act (amended) 2001 (or Act A1116)

b) Purpose

To regulate the electricity supply industry. Act A1116 also includes provisions on the efficient use of electricity.

c) Applicable sectors

All electricity users are bound under the act.

d) Outline

Part VA of the act provides the following provisions on the efficient use of electricity:

Section 23A: The minister may, from time to time, prescribe the standards, specifications, practices, and measures to be adopted as well as any other matters in regard to the efficient use of electricity.

Section 23B: No person shall use or operate any installation unless the installation meets such requirements, as may be prescribed in regard to the efficient use of electricity.

Section 23C: No person shall manufacture, import, sell or offer for sale (or lease) any equipment unless the equipment meets such requirements, as may be prescribed in regard to the efficient use of electricity.

e) Financial resources and budget allocation

Annual budget from the government.

f) Expected results

Electricity saving and better electrical load management.

2.2. Regulatory measures**g) Name**

The Efficient Management of Electrical Energy Regulations 2008 (EMEER 2008)

h) Purpose

To promote the efficient use of electrical energy through better energy planning and management.

i) Applicable sectors

Industrial and commercial.

j) Outline

The Efficient Management of Electrical Energy Regulations 2008 was gazetted on December 15, 2008, which required any installation with total electricity consumption of three million kWh or more over six consecutive months to appoint electrical energy managers and implement efficient electrical energy management.

k) Financial resources and budget allocation

Annual budget from the government

l) Expected results

Better energy management.

a) Name

Minimum Energy Performance Standards (MEPS) and Labeling

b) Purpose

To regulate the efficiency of electrical appliances available in the market.

c) Applicable sectors

Residential and commercial.

d) Outline

Five domestic electrical appliances (air conditioners, refrigerators, TVs, domestic fans, and lamps) are subject to MEPS requirements. MEPS values were set at a two-star rating. Increasing MEPS and labeling from five to 10 electrical appliances (rice cookers, electric kettles, washing machines, microwaves, clothes dryers, and dishwashers).

e) Financial resources and budget allocation

Annual budget from the government

f) Expected results

Eliminating inefficient electrical appliances from the local market.

2.3. Voluntary measures

The Green Building Index Malaysia (GBI Malaysia) certification is a profession-driven initiative to lead the Malaysian property industry to become more environmentally friendly. The energy efficiency of a building is one of the criteria for this certification.

The High-Efficiency Motor (HEM) program is a voluntary program to promote greater use of high-efficiency motors in Malaysia. The Energy-Efficient Refrigerator (EER) and Labeling Program is a voluntary program to promote energy-efficient refrigerators by introducing labels that highlight their energy use.

The Energy Efficiency and Conservation Guidelines Part 1: Electrical Energy-use Equipment: These guidelines encourage industries to adopt energy-efficient practices as well as manage and improve their energy use. The guidelines, covering a number of commonly used equipment, such as fans, motors, pumps, chillers, transformers, and air compressors, also highlight the best practices in the selection, design, operation, and maintenance of the equipment.

The Energy Efficiency and Conservation Guidelines Part 2: Thermal Energy-use Equipment: These guidelines encourage industries to adopt energy-efficient practices as well as manage and improve their energy utilization and environmental management. The guidelines, covering a number of commonly used equipment, such as boilers, thermal oil heaters, industrial furnaces, absorption chillers, heat exchangers, and cogeneration systems, also highlight the best practices in the selection, design, operation, and maintenance of the equipment.

2.4. Financial measures taken by the government

2.4.1. Tax scheme

The tax scheme for energy efficiency improvements are as follows:

Companies providing services for energy efficiency improvement are eligible for the following:

- a) Pioneer Status with an income tax exemption of 100% of the statutory income for 10 years.
- b) Investment Tax Allowance (ITA) of 100% on the qualifying capital expenditure incurred within a period of five years. The allowance to be set-off against 100% of the statutory income for each year of assessment.
- c) Import duty and sales tax exemption on energy-efficient equipment that are not produced locally, and sales tax exemption on the purchase of equipment from local manufacturers.

Companies that incur capital expenditures for improvements of their energy consumption are eligible for the following:

- a) Investment Tax Allowance of 100% of the qualifying capital expenditure incurred within five years.
- b) Import duty and sales tax exemption on energy-efficient equipment that are not produced locally, and sales tax exemption on the purchase of equipment from local manufacturers.

The Pioneer Status scheme and tax allowances expired in December 2015.

Companies that import energy-efficient products are eligible for the following:

- Exemption of import duty and sales tax is given on energy-efficient equipment, such as high-efficiency motors and insulation materials, to importers (including authorized agents approved by the Energy Commission).

Owners of buildings with a Green Building Index certificate are eligible for the following:

- Tax exemption equivalent to 100% of the capital expenditure incurred to obtain the certificate. New buildings and retrofitted buildings are also eligible for this incentive.

The buyers of buildings and residential properties with Green Building Index certificates are eligible for the following:

- Stamp duty exemption on instruments regarding the transfer of ownership of such buildings. The amount of stamp duty exemption is on the additional cost incurred to obtain the Green Building Index certificate.

The Green Building Index incentive expired in 2013.

2.4.2 Low-interest loan

a) Name

Green Technology Financing Scheme (GTFS)

b) Level

Federal government.

c) Purpose

To provide financial support to local, green-technology industries, encourage local industries to embark on green technology, and help incorporate green-technology elements into specific projects related to the identified sectors.

d) Applicable sectors

Energy, waste and water, building, and transport sectors.

e) Outline

The fund provides soft loans to companies that supply or utilize green technology. The maximum financing for companies who are producers and users of green technology is RM 50 million and RM 10 million, respectively. The government will bear 2% of the total interest/profit rate. In addition, the government will provide a guarantee of 60% on the financing amount via the Credit Guarantee Corporation Malaysia Berhad, with the remaining 40% financing risk to be borne by participating financial institutions. Loan applications can be made through the Malaysian Green

Technology Corporation (GreenTech Malaysia), an agency under the Ministry of Energy, Green Technology and Water.

Companies are required to submit their project proposals for technical evaluation to GreenTech Malaysia. Upon passing the technical evaluation, companies may apply for financing from any participating financial institution.

f) Financial resources and budget allocation

Participating financial institutions ó RM 3.5 billion.

g) Expected results

By the end of November 2015, 210 companies received loan approvals from financial institutions with a total amount of RM 2.4 billion. This will further spur green-technology development, especially regarding market creation and penetration of green technology in the economy.

2.5. Energy pricing

The electricity tariff in Peninsular Malaysia is determined through the Incentive Based Regulation (IBR) framework and the Imbalance Cost Pass-Through (ICPT) mechanism implemented in January 2014. The ICPT allows the government to review the electricity tariff every six months, based on changes in fuel and generation costs. The ICPT mechanism is adopted to promote transparency and enable subsidy rationalization to occur in order for the economy to be more competitive and resilient. The ICPT takes into account gradual reductions in piped gas subsidies as well as changes in the market price of liquefied natural gas, coal, medium fuel oil, distillates, and other generation costs such as those related to the PPAs, displaced costs from renewable energy, and the cost of importing electricity.

2.6. Other efforts for energy efficiency improvements

2.6.1. Cooperation with non-government organizations

The government has developed cooperation with non-government organizations such as the Federation of Malaysian Consumers Associations, the Water and Energy Consumer Association, the Malaysia Association of Energy Service Companies (MAESCO), the Federation of Malaysian Manufacturers (FMM), the Association of Consulting Engineers *Malaysia* (ACEM), and the Electrical and Electronics Association of Malaysia (TEEAM) to promote energy efficiency activities. The promotional activities are mainly in the form of campaigns, workshops, seminars, and publications of energy efficiency-related materials.

2.6.2. Cooperation through bilateral, regional, and multi-lateral schemes

Malaysia is actively involved in regional and multi-lateral schemes on energy efficiency improvements. Malaysia and other South East Asian economies under the Association of South East Asia Nations (ASEAN) agreed to improve energy efficiency through the ASEAN Plan of Action for Energy Cooperation (APAEC). The APAEC outlines strategies such as ASEAN energy standards and labeling, the promotion of ESCOs, information sharing, and capacity-building to improve energy efficiency in the region.

In the East Asia Summit (EAS) in which Malaysia was involved, the members agreed to work together to improve energy efficiency in the region. As a member of the United Nations, Malaysia also hosted the Malaysian Industrial Energy Efficiency Improvement Project (MIEEIP) with assistance and co-funding from the United Nations Development Program (UNDP) and the Global Environment Facility (GEF). The MIEEIP was aimed to address barriers to energy efficiency and energy conservation in the Malaysian industrial sector.

The Malaysian Chapter of the ASEAN Energy Management Accreditation Scheme (AEMAS), an initiative under the ASEAN Energy Efficiency and Conservation Sub-Sector Network (EE-SSN), was launched in 2011. The main objectives of the AEMAS are to reduce energy consumption in the industrial sector, reduce emissions of greenhouse gases, and increase the professional standing of accredited energy managers. The launch of the Malaysian Chapter of AEMAS marks an important milestone in the transition to an energy-efficient economy by placing high priority on human capital competency and drawing up of a code of practices to use technology more effectively.

The Promotion of Energy Efficiency and Conservation (PROMEEC) ó Energy Management for Malaysia was organized in November 2011. This program, under the EE-SSN, was jointly conducted with the ASEAN Centre for Energy (ACE) and funded by the Government of Japan. The PROMEEC is one of the capacity-building programs used to disseminate the energy data and reinforce the understanding and capabilities in managing energy more effectively.

The Building Sector Energy Efficiency Project (BSEEP), introduced in 2010, will last until the end of 2016. It is supported by the GEF and implemented by the UNDP and the Malaysia Public Works Department. The goal is to reduce the growth rate of greenhouse gas emissions in the building sector through improved energy efficiency in buildings, particularly in the commercial and government sectors. More specifically, it promotes energy-conserving designs for new buildings and related improvements in the operation of existing buildings.

Finally, the Industrial Energy Efficiency for the Malaysian Manufacturing Sector (IEEMMS), launched in April 2012, will last for five years. It was implemented by the United Nations Industrial Development Organization (UNIDO) and SME Corporation Malaysia. The project aims to improve energy efficiency in the manufacturing sector through the optimization of energy and production systems as well as the implementation of energy management systems based on the ISO 50001 standard.