

KOREA

1. GOALS FOR EFFICIENCY IMPROVEMENT

1.1. Overall Energy Efficiency Improvement Goals

The National Energy Basic Plan (2008–2030), announced in September 2008, stipulates that Korea will reduce its energy intensity to 0.185 TPES/GDP (tonnes of oil equivalent per thousand USD) in 2030 from 0.341 TPES/GDP in 2006. The improvement in 2030 from the 2006 base year is 46%, which is the equivalent to an annual improvement of 2% on average.

1.2. Sectoral Energy Efficiency Improvement Goals

Following the overall energy efficiency improvement goal, the government set sectoral energy efficiency improvement goals for 2017 with a 2007 base year as follows:

- *Industry sector*: reduction in energy use of 34.4 million tonnes of oil equivalent (Mtoe)
- *Transport sector*: reduction in energy use of 12.3 Mtoe
- *Residential and commercial sector*: reduction in energy use of 15.5
- *Public sector and others*: reduction in energy use of 1.9 Mtoe

1.3. Action Plans for Promoting Energy Efficiency

The 4th Rational Energy Utilization Basic Plan (2008–2012), or Energy Efficiency Initiative, is the latest action plan for promoting energy efficiency. It is part of the National Energy Basic Plan (2008–2030), which is expected to result in a 46% improvement in energy efficiency by 2030.

a) Objectives

The 4th Rational Energy Utilization Basic Plan aims for an 11.3% improvement in energy efficiency by 2012, compared with 2007. The average improvement rate of primary energy use is 2.3% per year during the period of the plan.

b) Applicable sectors

Industry, transportation, residential and commercial, public and others

c) Outline

The Energy Efficiency Initiative or Energy Efficiency Action Plan was approved at the 17th meeting of the National Energy Conservation Committee. The plan is designed to cope with high global oil prices and climate change and improve the trade balance. Under this action plan, sectoral energy saving programs have been implemented using various incentives and regulation policies such as, financing, tax reduction, R&D subsidy, certification, etc. The incentives provided by the governments include those for companies that invest in energy efficiency, the phase-out of incandescent lamps by 2013, and the implementation of a program modelled after the Japanese Top Runner Program to complement the current Energy Efficiency Label and Standard Program.

Furthermore, the government will take the following steps:

- Invest KRW 1.2 trillion (about USD 930 million) in seven core technologies—building energy management systems, electric power IT, energy storage, green vehicles, LEDs, technologies to improve energy efficiency of the most energy intensive appliances, and green home appliances
- Increase the average fuel economy of automobiles by 16.5% by 2012
- Increase the maximum floor area ratio by 6% for buildings with the highest level of energy efficiency (grade 1)

- Give priority to models with the grade 1 energy efficiency label and to products that deliver less than 1 watt of standby power when purchasing appliances for use in government buildings
- Divide businesses into four categories, depending on how much energy they consume to encourage businesses to improve energy efficiency. Specific measures such as negotiated and voluntary agreements will be made for each category.

d) Financial resources and budget allocation

The government has allocated USD 18.3 billion for the 4th Rational Energy Utilization Basic Plan (2008–2012), including USD 6.2 billion for the Rational Energy Utilization and USD 12.1 billion for the Land and Transport Infrastructure plans. The budget for Rational Energy Utilization includes government special accounts, electric power infrastructure funds, and so on. The plan promotes tax reduction in investment in industry and commercial buildings (20% reduction from the corporate or individual income taxes for the installation of specified energy efficiency facilities).

e) Method for monitoring and measuring effects of action plans

MKE (Ministry of Knowledge Economy) and KEMCO (Korea Energy Management Corporation) are responsible for monitoring and reporting on their individual programs, which are conducted through the activities of energy efficiency program evaluation, statistics (information gathering), benchmarking, etc. Monitoring projects usually have relied on R&D budgets from MKE to some extent. These efforts are compiled into the Report to National Energy Saving Promotion Committee. The latest report was submitted to the 16th National Energy Saving Promotion Committee (available only in Korean version).

f) Expected results

Savings of 34.2 Mtoe of TPES in 2012 (USD 10.3 billion in energy imports, which amounted to 1.2% of GDP in 2007)

g) Future tasks

Included is the establishment of an annual comprehensive action plan integrating regional energy efficiency schemes. The Government is also looking to enhance the reporting scheme for individual and sectoral energy consumption either statistically or using a sample survey.

1.4. Institutional Structure

a) Name of organisation

MKE, KEMCO and MLTM (Ministry of Land, Transport and Marine) are responsible for energy efficiency improvement in Korea

b) Status of organisation

MKE and MLTM are policymakers, while KEMCO is a policy implementer

c) Roles and responsibilities

Overall energy efficiency policy is driven by MKE. Energy saving activities in industrial and building sectors is managed by MKE, while construction-related work for energy efficiency in the transport and building sectors is managed by MLTM. The Prime Minister has coordinated overall economy-wide energy efficiency programs through the National Energy Saving Promotion Committee. KEMCO's role is to improve energy efficiency, diffuse renewable energy, and reduce greenhouse gases across various sectors. For this purpose, KEMCO implements various projects aimed at rationalising energy use. KEMCO has twelve regional offices.

Local governments have promoted energy efficiency by setting up the regional energy basic plans for a five-year period. Regional energy efficiency programs can be partially supported

by MKE, especially focusing on public sector innovation and demonstrations for energy efficiency.

KEMCO's regional offices have cooperated with regional NGOs and research institutes to implement regional energy efficiency activities based on the plan.

More information on KEMCO can be seen at the websites :
www.kemco.or.kr/new_eng/pg01/pg01050000.asp and
www.kemco.or.kr/new_eng/pg01/pg01060000.asp.

d) Covered sectors

Industry (including agriculture), transport, residential and commercial, and public and others

e) Established date

MKE was established in 2008 through merging the Ministry of Commerce, Industry, and Energy (MOCIE) with elements of the Ministry of Information and Communications, the Ministry of Science and Technology, and the Ministry of Finance and Economy, with the aim of creating an enhanced government instrument capable of meeting new challenges of the 21st century.

KEMCO was established in 1980.

f) Number of staff members

KEMCO had 475 staff members in 2008.

1.5. Information Dissemination, Awareness-raising and Capacity-building

a) Information dissemination

A wide range of information is readily available to Korean energy consumers. For example, the purchase of energy-efficient products is promoted by KEMCO through its website which provides energy efficiency and related cost saving information. A mandatory procurement guideline on purchasing energy efficiency products has been applied to public institutions.

b) Awareness-raising

Awareness campaigns have been undertaken with specific initiatives such as energy saving campaigns (Heating 2018 in winter, Energy Minus Love Plus in summer), National Energy Efficiency Awards, designation of November as Energy Saving Month, as well as public relations (PR) through the media (television, radio), a prize contest for PR materials (poster, catch phrases), an economy-wide exhibition (Korea Green Energy Show) and mobile exhibitions, and early education in elementary and middle school.

c) Capacity-building

Capacity building programs have been undertaken for various actors such as energy managers in the high energy-consuming industries or buildings above 2,000 toe per annum, boiler and pressure vessel operators, local government officials and energy auditors.

1.6. Research and Development in Energy Efficiency and Conservation

Technological innovations, adoption of new energy technologies and the diffusion of existing highly efficient energy technologies play important roles in achieving the overall energy efficiency improvement goal in Korea. In May 2006, the government announced the Basic Scheme for National Energy Resource Technology Development (2006–2015), which includes promotion of research and development in energy efficiency and conservation.

Reinforcing the support for technological innovation in the energy sector is also one of the key elements of the National Energy Basic Plan (2008–2030). In the industrial sector, Korea will increase its support for R&D to improve the energy efficiency of industrial equipment and facility upgrades, and provide support for companies that invest in energy efficiency.

The Korea Institute of Energy and Resources Technology Evaluation and Planning (KETEP) was established in December 2007, with a key mission of advancing energy technology R&D in Korea. Its main function is to support MKE in formulating energy technology policies. The Energy Efficiency R&D Program has been undertaken by KETEP with the objective of securing additional energy saving potential of 5% of TPES during the period 2006–15. Financial support for this program was USD 117 million in 2007, where government funding was USD 79 million.

The seven Runner Programs that focus on typical energy consuming end-use devices have been prioritised in energy efficiency R&D. Seven objects identified for R&D that cover about 41% of total final energy consumption include super boilers, premium electric motors, HVACs, industrial furnaces, dryers, lighting and home appliances. Individual R&D projects are generally undertaken in cooperation with enterprises, and R&D subsidies can be provided in part for the required total investment.

2. MEASURES FOR ENERGY EFFICIENCY IMPROVEMENT

2.1. Government Laws, Decrees, Acts

a) Name

Energy Use Rationalization Act(EURA)

b) Purpose

EURA is designed to result in sustainable development of the economy by stabilising energy demand and supply, increasing rational and efficient energy use, and reducing environmental damage caused by energy consumption.

c) Applicable sectors

EURA is applied to all energy end use sectors

d) Outline

In the wake of the second oil shock in 1979, the Ministry of Energy and Resources was established to exclusively administer the planning and enforcement of energy policies (it was later incorporated into the Ministry of Trade, Industry and Energy). In the following year, EURA was promulgated in an attempt to ensure energy security and promote energy efficiency and conservation.

Article 1 of EURA stipulates the purpose of the act, namely, to contribute to the sound development of the national economy and the promotion of welfare and international efforts to minimize global warming by realising the stability of demand and supply of energy, increasing the rational and efficient use of energy, and reducing the environmental damage caused by the consumption of energy.

EURA is comprised of the following chapters; General Provisions, Plans and Measures for Rationalization of Energy use, Policies for Rationalization of Energy use, Management of Heat-Using Machinery / Equipment or Materials, Organization of Constructors, Energy Management Corporation, Supplementary Provisions, Panel Provisions

Since its enactment, EURA has been amended several times, the latest amendment was passed in January 2010. The full text is available at the website (<http://elaw.klri.re.kr>) by typing in “energy use rationalization act” at search menu.

e) Financial resources and budget allocation

About USD 750 million was provided in 2008 by the rational energy utilisation special accounts.

2.2. Regulatory measures

2.2.1. Minimum Energy Performance Standards (MEPS) and Labelling

a) Name

Energy Efficiency Label and Standard Program

b) Purpose

The purpose of the Energy Efficiency Labelling program is to save energy by enabling consumers to identify high-efficiency, energy saving type products easily, and thus encourage manufacturers (importers) to produce (import) and sell these products from the beginning stage, through indicating the energy efficiency grade from the 1st to 5th grade. The minimum energy performance standard is to prohibit low efficiency products from spreading, and to promote the manufacturers' technical development by setting up and controlling the minimum required efficiency standard.

c) Applicable sectors

Appliances, lighting and equipment in the residential, commercial and industry sectors

d) Outline

The Energy Efficiency Labelling and Standard Program enables consumers to identify highly energy-efficient products easily by mandatory indication of the energy efficiency grade, mandatory reporting and applying MEPS.

Energy consumption efficiency grade labels have five grades, with 1st grade products having the best energy-saving quality. A 1st grade product saves 30%–40% more energy than a 5th grade product. To enhance the energy consumption efficiency grade, MKE and KEMCO make a constant effort to analyse each product's market state and skill standardisation, and they have been continuously upgrading the standard. If the standard is strengthened, different grades can be seen even among the same products.

The MEPS is the minimum energy efficiency standard suggested by the Government. It bans the production and sale of low energy-efficient products that fall below the MEPS. Those that fail to reach the MEPS are not allowed to be manufactured and sold. MEPS is applied to 30 items currently and 5 more items will be added within 2012. In case of a violation, a fine up to USD 16, 000 is levied on violators.

Detailed information is available at KEMCO website :

[http:// www.kemco.or.kr/new_eng/pg02/pg02100200_2.asp](http://www.kemco.or.kr/new_eng/pg02/pg02100200_2.asp)

e) Financial resources and budget allocation

No information available

f) Expected results

No information available

2.2.2. Building Energy Codes

a) Name

Energy saving design criteria for buildings

b) Purpose



The aim of energy saving design criteria for buildings is to improve the energy efficiency of the design and construction of new buildings.

c) Applicable sectors

Residential and Non-Residential

d) Outline

By encouraging low energy consumption-type buildings from the design stage, the increase in demand for energy in the building sector is expected to be suppressed.

MLTM developed building energy codes: local government building officials execute the codes as part of the building permitting process for new buildings. The property owner must fill out an energy saving worksheet and submit it to local government offices to obtain a building permit.

The submission of energy saving plans has become mandatory for buildings bigger than certain sizes to reinforce insulation, increase the supply of high-efficiency and new/renewable energy facilities, and promote the energy saving mindset among owners of buildings being constructed.

More information can be obtained at the following websites :

www.kemco.or.kr/new_eng/pg02/pg02010200.asp;
www.energycodes.gov/implement/pdfs/CountryReport_Korea.pdf.

e) Financial resources and budget allocation

No information available

f) Expected results

No information available

2.2.3. Fuel Efficiency Standards

a) Name

Average Fuel Economy (AFE) Program

b) Purpose

This is a system for managing the fuel efficiency of passenger cars through the average fuel efficiency calculated by dividing the sum of fuel efficiencies of passenger cars sold during the previous year by each car manufacturer by the quantity sold.

c) Applicable sectors

Transport

d) Outline

If a car manufacturer's average fuel efficiency does not satisfy the limit set by the government, it may order the improvement of fuel efficiency by a certain period. If the improvement order is not performed, a corresponding announcement may be published through the press.

Average fuel efficiency standard:

- 1) By 2011—1600cc or below displacement : 12.4 km/l, above 1600cc displacement: 9.6 km/l
- 2) From 2012 to 2015(gradually)—Fuel economy : above 17km/l, CO2 emission : under 140g/km

* A different standard is applied to imported vehicles.

More information can be found at KEMCO web site :
http://www.kemco.or.kr/new_eng/pg02/pg02030200.asp

e) Financial resources and budget allocation

No information available

f) Expected results

No information available

2.2.4. Energy Auditing

a) Name

Energy Process Consulting

b) Purpose

To improve the efficiency of energy use of businesses using large amounts of energy

c) Applicable sectors

Industry and commercial

d) Outline

In Korea, energy process consulting started in 1990 as a voluntary program. In 2007, the government made energy process consulting mandatory to improve the efficiency of energy use of businesses using large amounts of energy in response to the implementation of the UN Framework Convention on Climate Change and the Kyoto Protocol, aiming to reinforce the foundation for energy saving and reducing greenhouse gas emissions in consideration of persistently high international oil prices. Accordingly, businesses using large amounts of energy (annual energy use of 2000 toe or more) are required to conduct an energy audit every five years.

The energy process consulting service is applied to the overall energy system of plant such as energy supply, heat transport and heat consumption facilities, every aspect influencing energy intensity of the product is being considered during energy consulting.

KEMCO has been implementing an energy consulting service more than 30 years in domestic industrial and building sector to secure national and corporate competitiveness by improving the energy efficiency. KEMCO has been also contributing to the nation and enterprises through activities such as finding of improvement methods, development and distribution of energy optimization models.

GHG Reduction Technology Consultancy Department achieved the ISO 9001 Quality Management System certification for the energy consulting service.

Energy auditing determines a business's energy use status across all energy-using facilities in the energy supply, transportation, and use sectors, identifies factors causing losses, and suggests the optimum improvement scheme for energy saving. The subjects of support in the form of subsidy of energy audit costs are limited to small and medium-sized businesses using less than 10000toe of energy per year; the amount of the audit cost subsidy shall be determined and announced by the Minister of Knowledge Economy at the beginning of each year.

More information can be obtained at the following website:
www.kemco.or.kr/new_eng/pg02/pg02060000.asp.

2.3. Voluntary measures

There are many voluntary measures in place. The following are the main voluntary measures. Voluntary measures that are not described here include certification for high efficiency

products, eco-driving, no car once a week, demand-side management by energy suppliers, community energy supply systems, etc.

2.3.1. Building Energy Efficiency Rating

a) Name

Building certification system

b) Purpose

The purpose of the building certification system is to provide objective information regarding buildings' energy performance such as energy consumption, carbon dioxide emissions, and energy saving rates to the benefit of all parties related to the buildings such as construction project implementers, project owners, managing entities, and building users.

c) Applicable sectors

Office and Residential

d) Outline

Buildings subject to the certification system are newly-built apartments and office buildings. Upon the application by construction implementers of these buildings (contractors, implementers, etc.), preliminary certification is given before completion based on the result of evaluation performed through design drawings, etc. Final certification of the energy efficiency grade of the applicant buildings is provided at the time of completion based on the result of the final evaluation made using the final design drawing and field surveys.

2.3.2. ESCO (Energy Saving Service Company)

a) Name

Energy Saving Service Company

b) Purpose

The purpose of legislative measure for ESCO is to encourage investments in energy saving facilities through professional companies that provide a broad range of comprehensive energy saving solutions to energy users, with investment cost covered by energy bill reductions.

c) Applicable sectors

Industrial and commercial

d) Outline

The ESCO program was launched in 1993. In the beginning there were only 3 registered ESCOs working in the field; the number has increased to 209 in 2011. ESCOs focus mainly on high efficiency lighting, waste heat recovery, heating and cooling system, and manufacturing process improvement.

When energy users want to replace or improve existing facilities and are unable to do so due to technical or financial problem, they can make a contract with ESCOs. After the contract, ESCOs will make an investment in energy saving facilities on behalf of the energy users and the ESCOs profit from the energy cost savings.

The legal grounds for energy service companies were established under the Energy Use Rationalization Act in 1991. Energy service companies have been registered and operated since 1992.

The scope of projects to be implemented includes :

- 1) Projects related to energy saving-type facilities investments
- 2) Management/service projects for energy saving of energy using facilities

- 3) Projects related to energy saving such as energy management, diagnosis, etc.

Detailed information is available at the website:
www.kemco.or.kr/new_eng/pg02/pg02070000.asp

2.4. Financial Measures Taken by the Government

2.4.1. Tax scheme

a) Name

Tax Reduction and Exemption Act (by National Tax Service)

b) Purpose

Tax incentives are provided by the government for energy efficiency investments based on the Tax Reduction and Exemption Act of the National Tax Service. The purpose of these tax incentives is to strengthen the competitiveness of business enterprises through promoting investment in energy saving facilities.

c) Applicable sectors

Industry and building (commercial)

d) Outline

If any domestic person invests in the installation of specified energy efficiency facilities, 10% of the relevant investment amount shall be deducted from their income tax or corporate tax. This scheme started in 1982, and has been applied temporarily during designated time periods. Current terms of the tax credit are valid until 2013.

Detailed information is available at the website :
www.kemco.or.kr/new_eng/pg02/pg02080000.asp

2.4.2. Low-interest loans

a) Name

Energy Use Rationalization Fund (1980)

b) Purpose

To strengthen the competitiveness of business enterprises through promoting investment in energy saving facilities

c) Applicable sectors

Industry and commercial building

d) Outline

Since 1980, the government has provided long-term low-interest loans for energy efficiency and conservation investments, along with tax incentives. KEMCO is in charge of operation and monitoring of the loan. The rate of the loans is 2.0~2.25% per year, as of the fourth quarter of 2011.-More information is available at the following website:

www.kemco.or.kr/new_eng/pg02/pg02080000.asp.

e) Financial resources and budget allocation

USD 0.5 billion is allocated to the fund from a government financial source named Special Accounts for Rational Energy Utilization.

f) Expected results

No information available

2.4.3. Subsidies and Budgetary Measures

a) Name

Energy Efficiency Rebate Program for Electricity End-Use

b) Purpose

The Energy Efficiency Rebate Program for Electricity End-Use seeks to promote retrofitting for high-efficient products that have been designated for seven items, i.e. transformers, inverters, ballasts for 32W fluorescent lamps, ballasts for metal halide lamps, LED guide lights(emergency, hallway), LED lamps(internal converter), LED lamps(external converter).

c) Applicable sectors

Industry, residential, commercial (electric power use)

d) Outline

The rebate program was started in 1995 by Korea Electric Power Corporation (KEPCO). The program has been supported by the Electric Power Industry Infrastructure Fund since 2002.

e) Financial resources and budget allocation

The amount of the Fund was USD 5 million in 2008. The fund has been raised from a 3.7% obligatory charge in the electricity bill of all customers.

2.4.4. Other Incentives

a) Name

Incentives for small-sized vehicles

b) Purpose

To promote low energy consuming lightweight passenger cars

c) Applicable sectors

Transport

d) Outline

Several incentives such as tax exemptions for purchasing, registration and acquisition, 50% discounts on parking fees and tolls and congestion charges are provided.

2.5. Energy Pricing

The consumer price of oil products is determined by market-based pricing systems, but major parts of that price are taxes. Prices of electricity, city gas and thermal energy supply can be controlled by the government through adjusting the corporate investment maintenance ratio that is required by each tariff structure.

Currently, cumulative electricity pricing according to the amount of use has been applied to the residential sector. However, total balanced development of the energy efficiency pricing structure for energy use or GHG emission impacts would be courageous work, because restructuring the energy pricing system can be a heavy and difficult process in regard to social acceptance. Therefore, until now, subsidies and tax incentives have been urged to promote consumer behaviour for energy efficiency.

2.6. Other Efforts for Energy Efficiency Improvements

2.6.1. Cooperation with Non-Government Organisations

Energy efficiency campaign programs, which require the participation of the private sector, have been performed in cooperation with NGOs. NGOs act as a representative voice of the attitude or behaviour regarding citizens' energy efficiency.

2.6.2. Cooperation through Bilateral, Regional and Multilateral Schemes

Korea has been actively participating in international cooperative activities such as IEA 4E, APEC EGEE&C, IPEEC and so on, to develop policies to enhance energy efficiency in the facilities and equipment sectors and to strengthen international cooperation systems.

IEA 4E (Implementing Agreement on Efficient Electrical End-Use Equipment) is one of the implementation agreements of IEA (International Energy Agency), which seeks to promote the adjustment and development of policies of various economies through collaborative research and forums, etc., aimed at enhancing machine efficiency.

In cooperation with the IEA 4E, the Ministry of Knowledge Economy and KEMCO are participating in the main annex, Mapping & Benchmarking(M&B). The overall goal of the M&B Annex is to provide policy makers with a single source base of knowledge on product performance and associated policy tolls employed by economies across the world, enabling more informed policy making at the national and regional levels.

APEC EGEE&C (Expert Group on Energy Efficiency and Conservation) is one of the expert groups under the EWG (Energy Working Group), which targets energy saving as well as the development of energy efficiency policies and technologies. Established in 2002 to exchange information on energy efficiency standards and labelling systems, it is operated using funds shared by all the economies. Korea hosted the 38th APEC EGEE&C meeting in Seoul on November 2011.

The EGEE&C has maintained the Energy Standards Information System(ESIS) since 2002. ESIS provides the latest information about energy standards and regulations for appliances and equipment. The Ministry of Knowledge Economy and KEMCO funded \$10,000 for this ESIS project in 2007 and continue to take an active role in this system.

IPEEC(International Partnership for Energy Efficiency Cooperation) is an international partnership for energy efficiency cooperation among G8(United States of America, United Kingdom, France, Germany, Italy, Canada, Japan, Russia) + 5(China, India, Brazil, Mexico, Korea) countries.

Under IPEEC, 8 international task programs are currently being carried out. Korea is participating in two task programs, SBN(Sustainable Buildings Network) and GSEP(Global Superior Energy Performance partnership).

2.6.3. Other Cooperation/Efforts for Energy Efficiency Improvement

Other efforts for energy efficiency improvement include ‘Low-income energy efficiency’ (USD 10 million in 2008), ‘no car once a week in the public sector’ (as for 2008, passenger cars were permitted only every other day), ‘central bus-only lanes in metropolitan areas (Bus Rapid Transit)’ and ‘bus-only highway lane’, etc