MEPS experience in Korea

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.... about KIER

http://www.kier.re.kr

? Since its establishment in 1977, the Korea Institute of Energy Research (KIER), a non-profit scientific research institute supported by the government, is responsible for energy technology development as well as for research activities.

MAIN FUNCTION

? Development of energy conservation technology

? Development of new and renewable energy technology

? Research on fossil fuel utilization and clean environment preservation

? Research on energy policy

? Testing and inspection of energy equipment

? Education and consulting about energy technology

Energy Review in Korea

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? With the rapid economic growth, the total primary energy consumption of Korea has increased from 43.9 million TOE in 1980 to 181.2 million TOE in 1999, to rank Korea as the 10th largest energy-consuming country in the world.

? Per capita energy consumption also increased from 1.15 TOE in 1980 to 3.89 TOE in 1999.

? As Korea is endowed with very few energy resources, it relies on almost all energies needed from abroad. For example, Korea's energy import dependence reached 97% in 1999.

? In addition, its high fossil fuel dependence reaching some 80% concerns environmental impacts.

? In an effort to solve these problem, the Korean government has put foremost energy policy priority on energy efficiency and conservation, because it offers a win-win strategy that provide environmental benefits, including reducing greenhouse gas emissions, while reducing energy import dependence, as well as reducing direct energy costs.

Background

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? With economic growth and improvements in the national standard of living, the demand of the electricity in the residence was increased from 162 GWh in 1961 to 17,735 GWh in 1990, growth of 109.5 times.

? Therefore, the ratio of electricity in the residential sector was a steady increase from 13.6% in 1961 to 18.8% in 1990 of total consumption in that year.

? Major appliances except air conditioner are already saturated. Hence, the number of room air conditioners is rapidly increased.

? Particularly, in Korea, a surplus of electric power in summer was abruptly drop down from 52% in 1987 to 5% in 1991. Unless the policy of energy savings is put in force immediately, the limited supply of electric power will be possible.

? In these viewpoint, the energy standards and labeling program was introduced in 1992, and it has played a key role particularly in curbing the steep growth of electricity consumption.

Energy Efficiency Program in Korea

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? In 1980, the Ministry of Commerce, Industry and Energy (MOCIE) promulgated the ***Rational Energy Utilization Act*** to serve as a basic law for energy efficiency and conservation and established the Korean Energy Management Corporation (KEMCO) to implement energy efficiency and conservation programs.

? In 1992, MOCIE mandated a "*Regulation on Energy Efficiency Standards Setting and Rating Labeling*" for particular types of selected consumer products. The energy efficiency standards & rating levels are reviewed every three years and changed if necessary.

? In the beginning, 6 items were included this program.

- refrigerators and refrigerator-freezers
- room air conditioners
- incandescent lamps
- fluorescent lamps (T-10 tubular 20W, 40W & circular 32W)
- ballasts for T-10 fluorescent lamps
- passenger cars

- In 1999 &2001, 5 items were added to this regulation:
  - fluorescent lamps (tubular T-8 32W & circular T-10 40W) and associated ballasts,
  - screw-based compact fluorescent lamps (self-ballasted CFLs),
  - clothes washers, and
  - household gas boilers.

- The followings are considered to be added in the future:
  - gas water heaters,
  - dishwashers,
  - T-5 lamps and associated ballasts,
  - vending machines, and
  - refrigerators for Kimchi (it is in Korea only for the vegetable food to storage), etc.

Energy Efficiency Rating Label

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- Energy efficiency rating labeling is made *mandatory*.

- *The purpose of energy efficiency rating label* is to save energy by enabling the consumers to identify the energy saving products easily through indicating the energy efficiency rating from the grade 1 to grade 5.

- The rating label established a 5-rank system for labeling the energy use of appliances. The most energy efficient models (products that correspond to TEPS) receive a grade 1, and the least efficient models (products that correspond to MEPS) receive a grade 5.

- Generally, grade 1 models can save 30 40% compared to grade 5 models.

- This is the opposite of the classification system used in Thailand in which the most efficient models receive a grade 5.

- The Rating is calculated by assessing the ratio of the appliance consumption (kWh/month, COP, lm/W, BEF, etc.) compared to the TEPS.

- Labels must be adhered to all products and mentioned in all advertising. Products also include instructions on how to use the appliance efficiently.

- Energy efficiency rating label for refrigerator-freezers

Energy Efficiency Rating(grade1 to grade 5)

The closer to grade 1, the more energy saved!

Name of model

Total Volume

Volume of the fresh compartment

Volume of the freezing compartment

Energy consumption(kWh/month)

This rating is based on the rational energy utilization act

MEPS & TEPS

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- In 1992, MOCIE was authorized to set MEPS levels on the basis of analyses carried out by agencies such as KIER and through negotiation with the private sector.

- Energy efficiency standards program consists of energy efficiency rating indication, MEPS and TEPS. MEPS is mandatory; TEPS is voluntary.

- MEPS levels are reviewed every three years and changed if necessary. When the MEPS levels are made more stringent, the TEPS levels are also made more stringent.

- The energy tests are detailed in Korean Industrial Standards (KS), which are closely related to equivalent Japanese Industrial Standards (JIS) and/or IEC standards.

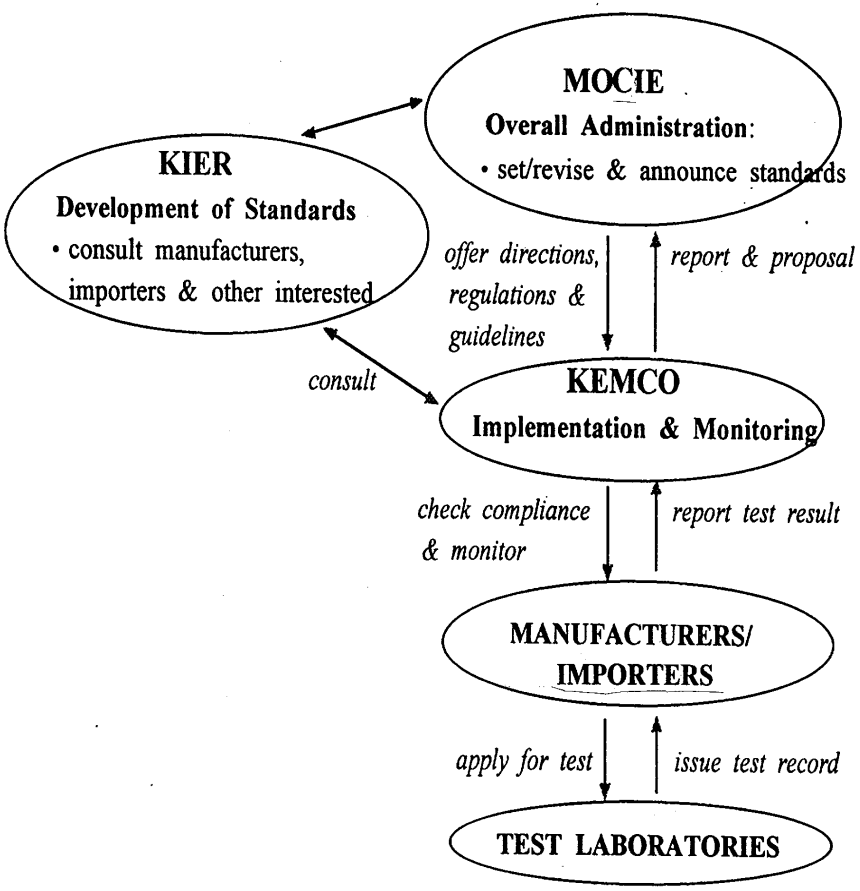
- **The target of MEPS** is to *push* the market by prohibiting the sale of the manufacture and sale of grade 5 low products (least energy efficient products). A grade 5 is the MEPS level. The philosophy behind the MEPS is that it can be attained with existing technology or technological innovation, at little or no extra cost.

- **The goal of TEPS** is to *pull* the market by promoting a higher-efficiency target that can be achieved by manufacturers within a given time period (normally 3 years) and reduce current energy consumption in the range of 10 30%. A grade 1 is the TEPS level.

- The setting (for new products) or amending (for current energy labeling products) of energy efficiency standards and rating calls for the following steps;

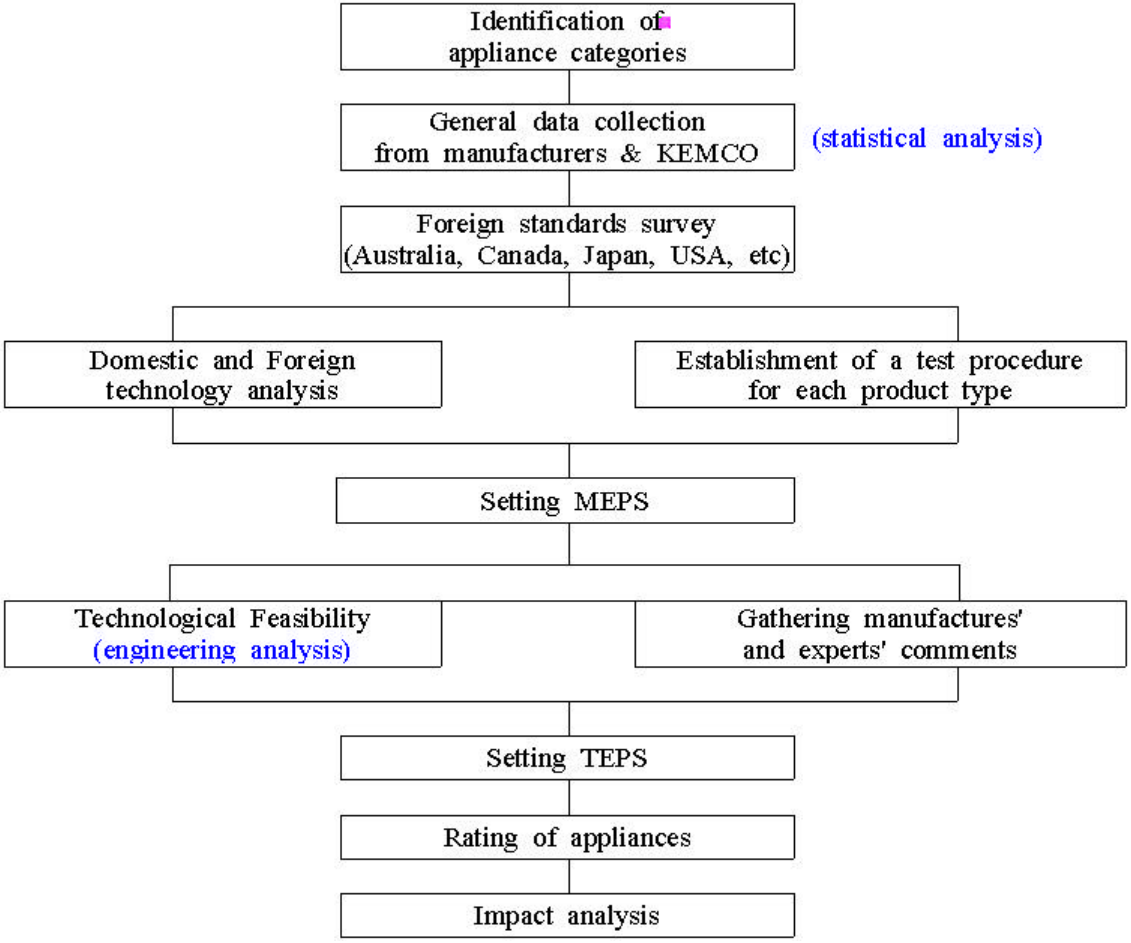
1. In the 1st year for a given product, mandatory energy efficiency rating labeling goes into effective, and MEPS & TEPS are announced.
2. In the 2nd year, MEPS come into effect (mandatory)
3. In the 3rd Year, TEPS come into effect (voluntary)

- Implementation process of MEPS and labeling program



MOCIE is responsible for establishing the framework for the program such as setting/revising and announcing standards. **KEMCO** is charged with implementation and monitoring of the program. **KIER** mainly involves standards setting, in consultation with MOCIE, KEMCO, and the manufacturers and importers concerned, and formulate energy efficiency standards & rating labeling rules.

- Methodology for Setting Energy Efficiency Standards and Rating



Impact of Program

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1. Awareness of the energy efficiency rating label

< The survey in 1994, 1996 by KEMCO >

- Analysis(of result) showed that program has very high visibility and recognition.
- 85% of general consumers and 96% of appliance purchaser were aware of the label.
- 72% said they used the information on it to compare appliances prior to purchase.
- The result of survey gave energy efficiency equal importance with other key appliance characteristics such as price, function, brand and size.

2. The Program led to a substantial market transformation

- the percentage of energy efficient appliances on the market (grade 1 or grade 2) has steadily increased from 53.3% in 1993 to 67.5% in 2000, in spite of the reinforced and higher level energy efficiency standards and rating in 1996, 1999, 2001 in each product.

3. The Program also led to an improvement in average energy efficiency levels for some of the appliances regulated by TEPS

Appliance Type	Measurement unit	1993 Efficiency (market average)	2000 Efficiency (market average)	% Improvement in efficiency
Refrigerator-freezers	kWh/month/liter	0.113	0.065	74%
Room air conditioners	COP	2.4	3.7	54%
Incandescent lamps	lm/W	10.0	11.0	10%
Fluorescent lamps	lm/W	65.0	90.0	39%

Future of Program in Korea

- The program is being studied
  - extension of subject products
  - a shift in testing protocols from KS to ISO for electric appliances

- we are very considering to make MEPS level highly, but not to make the grading in the future.

Conclusion

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- As a whole, the program in Korea is found to be operating successfully without major negative impacts.
- Appliance energy efficiency is now a key program area for government, serving greenhouse gas reduction, economic efficiency and resource conservation policies.
- Government, the appliance industry and consumer groups are now all playing key roles in promoting greater appliance energy efficiency in Korea.
- Once initial difficulties were overcome, the high degree of co-operation and consultation between all parties has resulted in the rapid and harmonious development of the program.