

EE Programs in Korea

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Kyung Soon Park
KEA

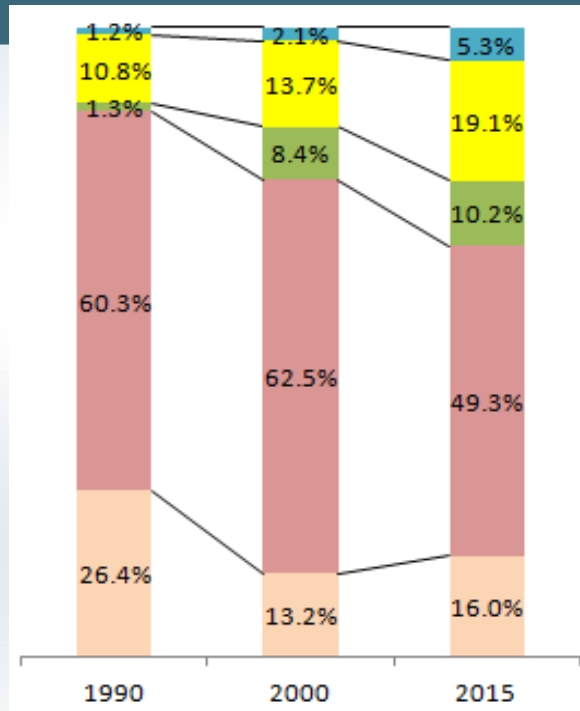


Contents

- 1 Energy Consumption**
- 2 2nd Energy Master Plan**
- 3 KEA at a Glance**
- 4 EE Programs by Sector**

1. Energy Consumption

- High dependency on imported energy : **95.2%**
- Cost of energy import: **102.7 billion** in 2015
 - 23.5% of total import



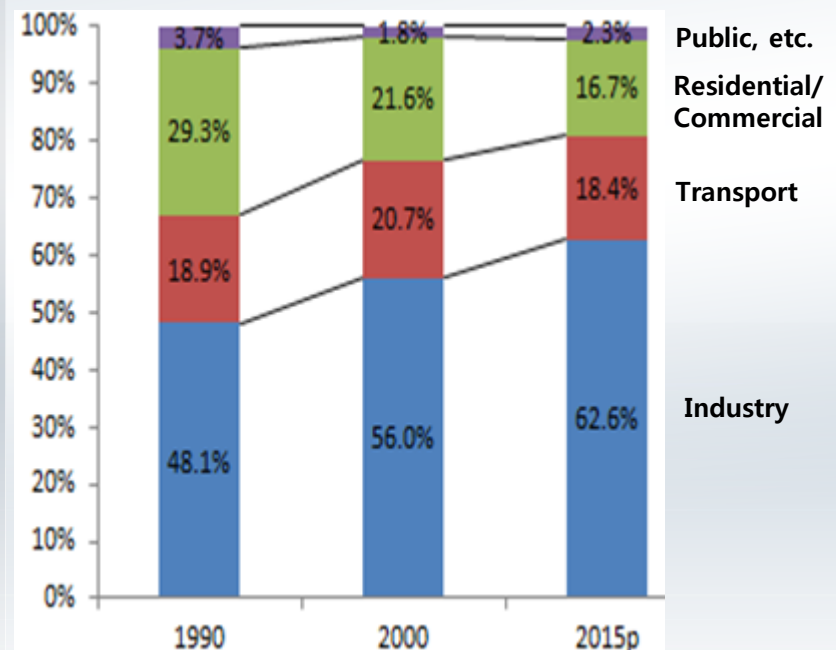
Renewables, heat

Electricity

LNG

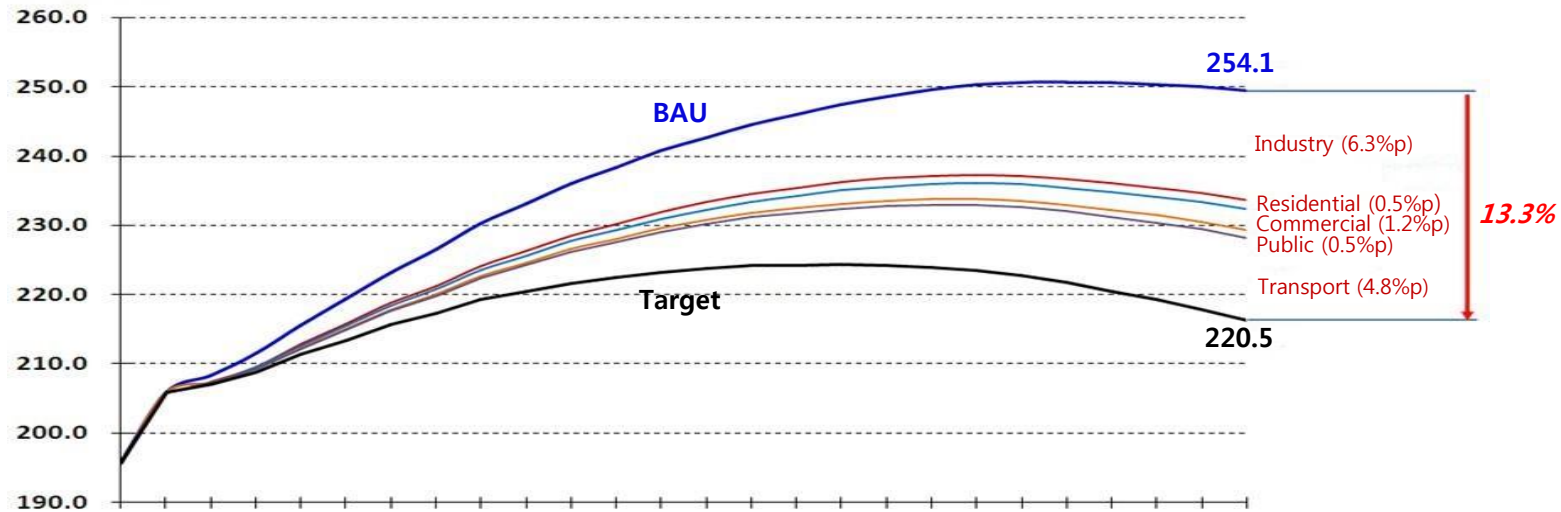
Oil

Coal



2-1. 2nd Energy Master Plan: EE Target

- Reduce final energy consumption by **13%**



Improve energy-intensity to **30% of 2011 level** through national energy master plan(~'35)

▶ Korea has low potential of energy saving due to energy-intensive industrial structure

Need stronger measures for transition into low-energy economy

2-2. 2nd Energy Master Plan: 6 Core Plans

1. Shift the Focus from Supply Management to **Demand Management**
 - Reorganize energy tax, improve power tariff, promote ICT DSM
2. Promote **Distributed Power Generation**
 - Supply **15%** of power with distributed system by 2035
3. Enhance **Sustainability of Energy Policies**
 - Improve climate change responses, strengthen the nuclear safety
4. Strengthen **Energy Security**
 - Reinforce national energy/mineral corp., pursue wider NRE deployment
5. Build **Stable Energy Supply Chain**
 - Diversify supply lines, increase domestic energy reserves
6. Pursue **Citizen-friendly Energy Policy**
 - Strengthen energy welfare, respond to energy conflicts preemptively

3. KEA at a glance

- **Established** in 1980 under Rational Energy Utilization Act
- **Work Scope**
 - Energy Efficiency, New & Renewable Energy Promotion, Climate Change Mitigation, etc.
- **Budget('16)**
 - 1,167 million USD(including Soft Loan, FIT, Subsidies)
- **Organization**
 - 20 Departments. 12 Branches, 1 Affiliate (New & Renewable Energy Center)
- **No. of Staff** : 546

6

(1 USD = 1,200 KRW)

| Budget(2016) | Million USD |
|----------------------------------|--------------|
| Operational Budget | 59 |
| Govt.-trusted Fund(A+B+C) | 1,108 |
| (A) EE | 602 |
| - EE Soft Loan | (417) |
| - Energy Welfare Subsidy | (76) |
| - New Energy Industry and others | (109) |
| (B) RE | 496 |
| - FIT | (335) |
| - RE Soft Loan | (83) |
| - RE Deployment | (66) |
| - Others (C) | (12) |
| (C) CC | 10 |
| - ODA | (2) |
| - Others (C) | (8) |
| TOTAL | 1,167 |

4. EE Programs by Sector

4-1. Industrial EE

- ETS, GETM, Energy Audit, Soft Loan, ESCO, etc.

4-2. Appliance EE

- EE Labeling, Certification, etc.

4-3. Building & Transport EE

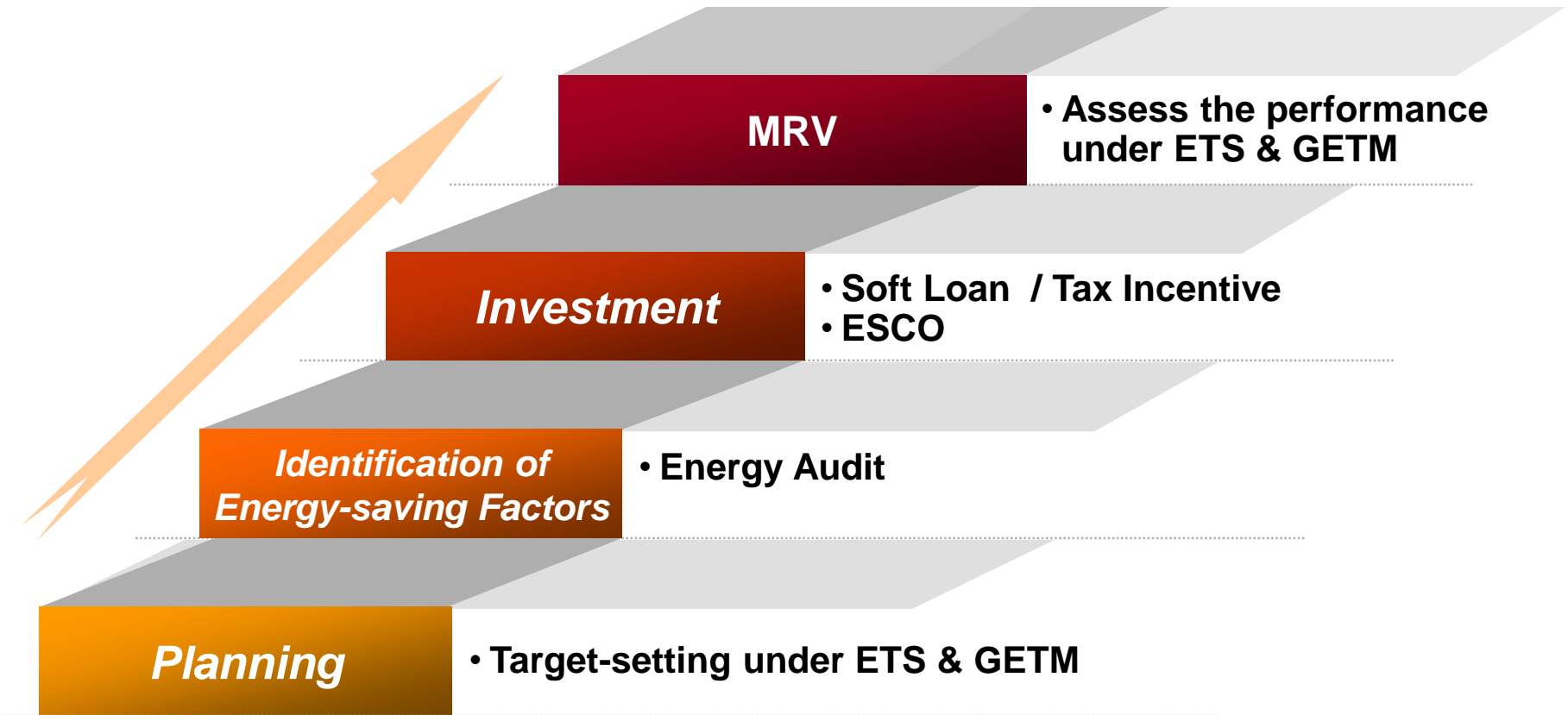
- Bldg. Code, Bldg EE Rating, Fuel/Tire Efficiency, etc.

4-4. Cross-sectoral Programs

- Awareness, Campaigns, Education/Training

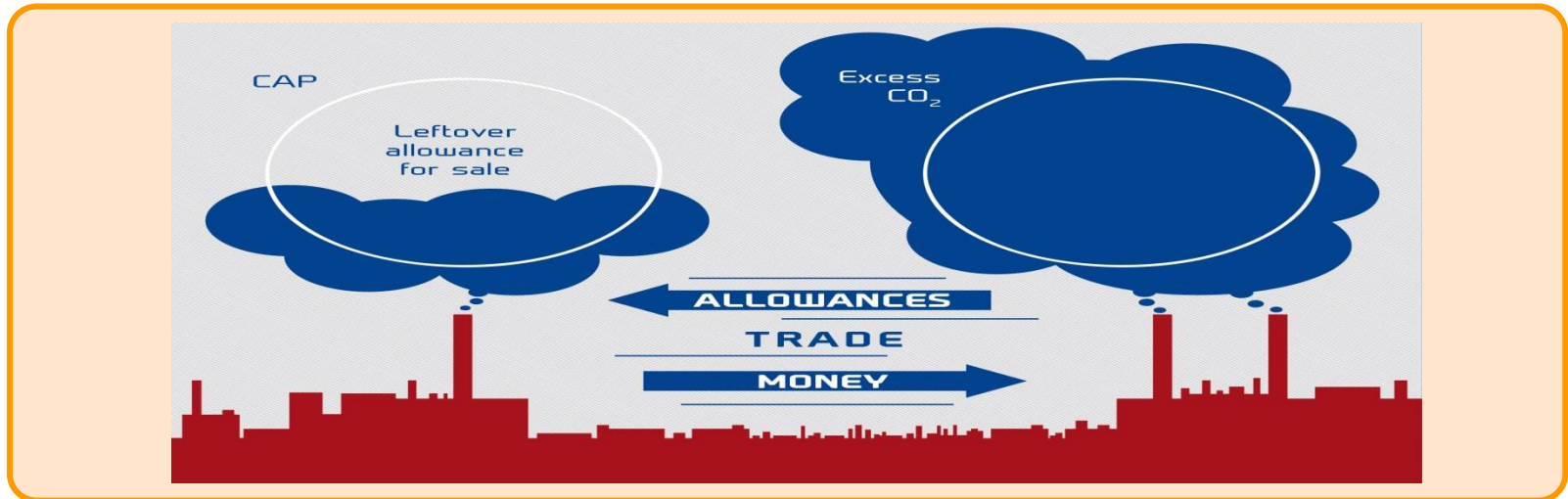
4-1. Industrial EE (Target: Energy-intensive Co.)

How we work: Industrial EE Scheme



Emission Trading Scheme

- **ETS:** Government-mandated, market-based approach to controlling pollution by providing economic incentives for achieving reductions in the emissions of pollutants. Target entities are the biggest emitters(over 25,000 tCO₂/yr).



- **Introduced in 2015,** the ETS will play an essential role in meeting Korea's 2030 NDC target of 37% relative to BAU emissions

GHG-Energy Target Management Scheme

- **Cap and No Trade** : Heavy emitters (over 15,000 tCO₂/yr and less than 25,000 tCO₂/yr) are required to negotiate their GHG-energy reduction target with government, implements actions, get assessed and get penalty if failed.



- **Introduced in 2012, starting from emitters of over 25,000 tCO₂**
Contributed to successful introduction of ETS in 2015, providing test pilot experiences to policymakers, target emitters and various stakeholders

Energy Audit

- Survey & analyze on-site Energy Management
- Identify Energy Loss Factors & Propose Improvement Measures

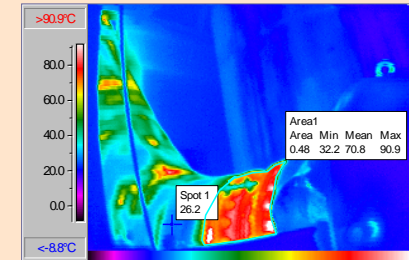
Heat Audit



Electricity Audit



TVS Audit



- 2,719 factories and buildings have been audited(~2016)
 - 17 overseas(Mexico, Bolivia, Guatemala, Oman, Thailand, etc.)
- Train Energy Auditors in Private Sector & Enhancing Audit Quality

Soft Loan & Tax Incentive

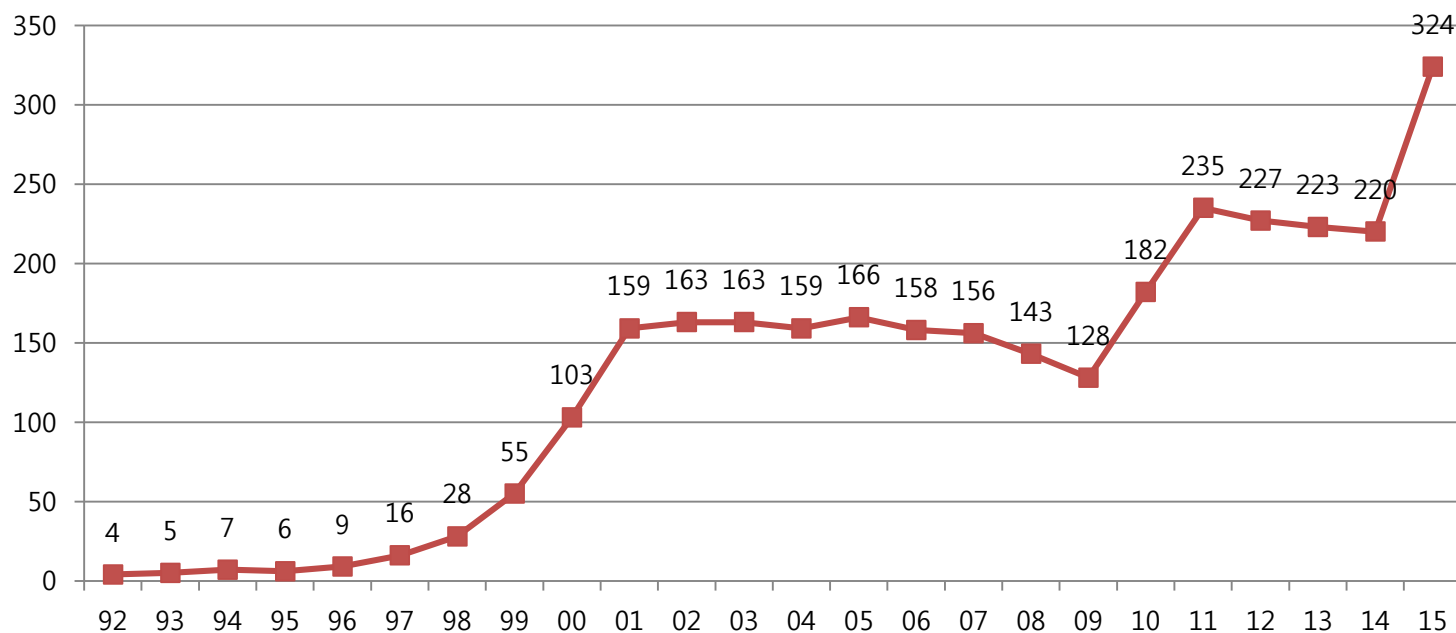
- **Soft Loan is provided to support Energy Efficiency Investment**
 - Interest rate is far lower than market rate, currently 1.5~1.75%

| | % | Grace Period/ Repayment (yr) | 2016 Budget (mil. USD) |
|-----------------------------|---------------------------|---------------------------------|---------------------------|
| ESCO | 1.50 (2.75, fixed) | 3 / 7 | 187.5 |
| Energy-saving Facilities | 1.5(SME) 1.75(non-SME) | 3 / 5 | 187.5 |
| GETM | 1.5 | 3 / 5 | 41.7 |
| Total | | | 416.7 |

- **10% of Tax Credit is given to Energy Efficiency Investment**

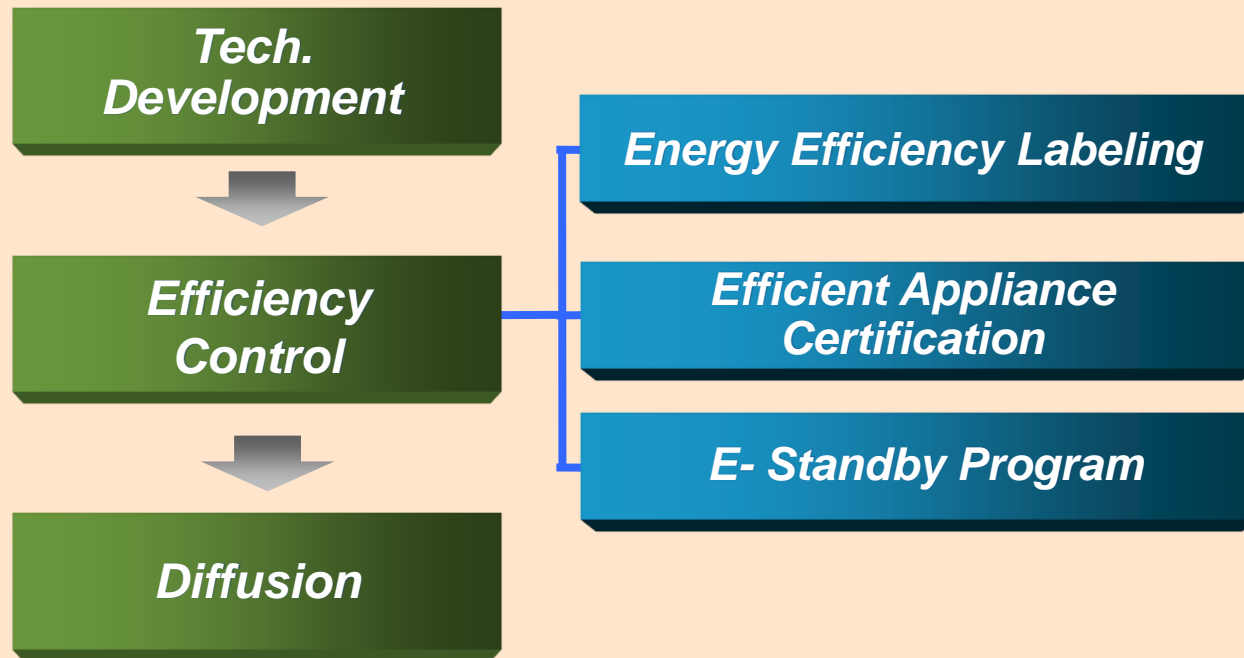
Promoting ESCO Activities

- No. of ESCOs has been increased from 4 in 1993 to 324 in 2015



- KEA's soft loan to ESCOs has been contributed to significant increase of ESCO activities
- USD 2.27 bil. has been invested during 1993-2015
 - Average investment was around USD 0.7 mil.

4-2. Appliance EE



- **Provide Information for Consumer Choice**
- **Provide Financial Support to Efficient Appliance Installation**
- **Require Public Organizations to use Efficient Appliances**

Appliance Efficiency Improvement

- **Energy Efficiency Labeling**

- **Mandatory 5-grade Label with MEPS**
- **27 Items: Refrigerator, Washing Machine, etc.**



- **Efficient Appliance Certification**

- Certificate and rebate to efficient products
- 47 Items: Lighting, Pump, etc.



- **e-Standby Program**

- Automatic shift to low standby power mode
- 21 Items: PC, Copier, Set-top box, etc. 



4-3. Building & Transport EE

Bldg EE Certification & Bldg Energy Code

- **BEEC: Induce low-energy building at construction stage**
 - Grade Certificate(1⁺⁺⁺ to 7th) is issued according to energy use per unit area, using simulation tool and on-site survey
 - Target bldg : All types of bldg, new and existing bldg
- **Continuous Reinforcement of Bldg Energy Code**
 - Energy Saving Plan should be submitted to local government when getting construction permit for large bldg(floor area of more than 500 m²)
 - Insulation standard will keep strengthened to achieve target of achieving Zero Energy Bldg for new buildings by 2025

Transport Energy Efficiency

- **Average Fuel Economy & Fuel Efficiency Labeling**

Requires car producers and importers to meet average fuel economy standard

- Standard('17→'20): 19.2 → 24.3 km/l, 123 → 97g/km
- Applied to passenger/light duty cars/light trucks(below 3.5t)

Also requires to attach fuel efficiency label on windows to raise vehicle EE awareness among consumers

- **Tire Efficiency Labeling**

Introduced in 2012 to promote efficient tires and thus reduce fuel consumption

- currently applied to passenger cars and light trucks

4-4. Cross-sectoral: Awareness, Campaigns, Training/Education



www.gogef.kr

Green Energy Family



Energy[-], Love[+]

Energy conservation and social service



Optimal indoor heating and lifestyle



Tire-Up, Energy-Down

Proper tire pressure and Eco-driving culture

Green ballpark

Reduction of standby power of electronics

Various consumer friendly campaign

Practical Early Education Program for energy conservation

- * Elementary school : 546 groups,
 - * Middle school : 299 groups,
 - * High school : 232 groups
 - * Others : 731 groups
- Total : 1,808 groups



Food for Thought : EE Restaurant

- Needs a professional chef
 - A **dedicated EE organization** is needed : **KEA**
- Needs money to hire good staff and prepare fresh ingredients
 - Secure **dedicated fund** such as levy on fuels: **Energy Special Account**
- Chef cannot cook bare hands. Needs cooking tools
 - Empowered with a systematic mix of **carrots & sticks** : **Soft Loan/Tax Incentive, GETM/Appliance S&L/Building Code/CAFE**
- Keep all ears to VOC: Network → Communication!!! → Trust
 - Establish **regular network** with stakeholders and change to the changes by getting feedback : **ESP, Energy Managers**
 - Implementation is successful when trust is built in the market
 - Market trusts the authority when it gets right signals of strong punishment and attractive incentives and it develops right sensors

Thought to Chew: EE Puzzle

- There is **no silver bullet in EE**
 - Situation keeps changing : Electrification of Energy, Urbanization, EV, China dominance, Connected device
 - Responding to changing market, EE needs to be a **continuous all-out effort in every sector**
“**Ten spoons** of rice makes **one bowl** of rice”
- KEA's motto: The **answer** to your question is **on sites**
 - Pieces of EE are scattered in the nooks and corners
Use your spoons or forklifts to collect them
 - You can enjoy the view of beautiful picture when you **put together the pieces of jigsaw puzzle** with patience
 - RE is visible, EE is not. Let's make it visible!

