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# **Energy Management For Green Growth in Korea**

**January 26, 2010**

**ENERGY EFFICIENCY BUREAU  
MINISTRY OF KNOWLEDGE ECONOMY**

Item 1-4

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II. ENERGY CONSUMPTION TREND IN KOREA

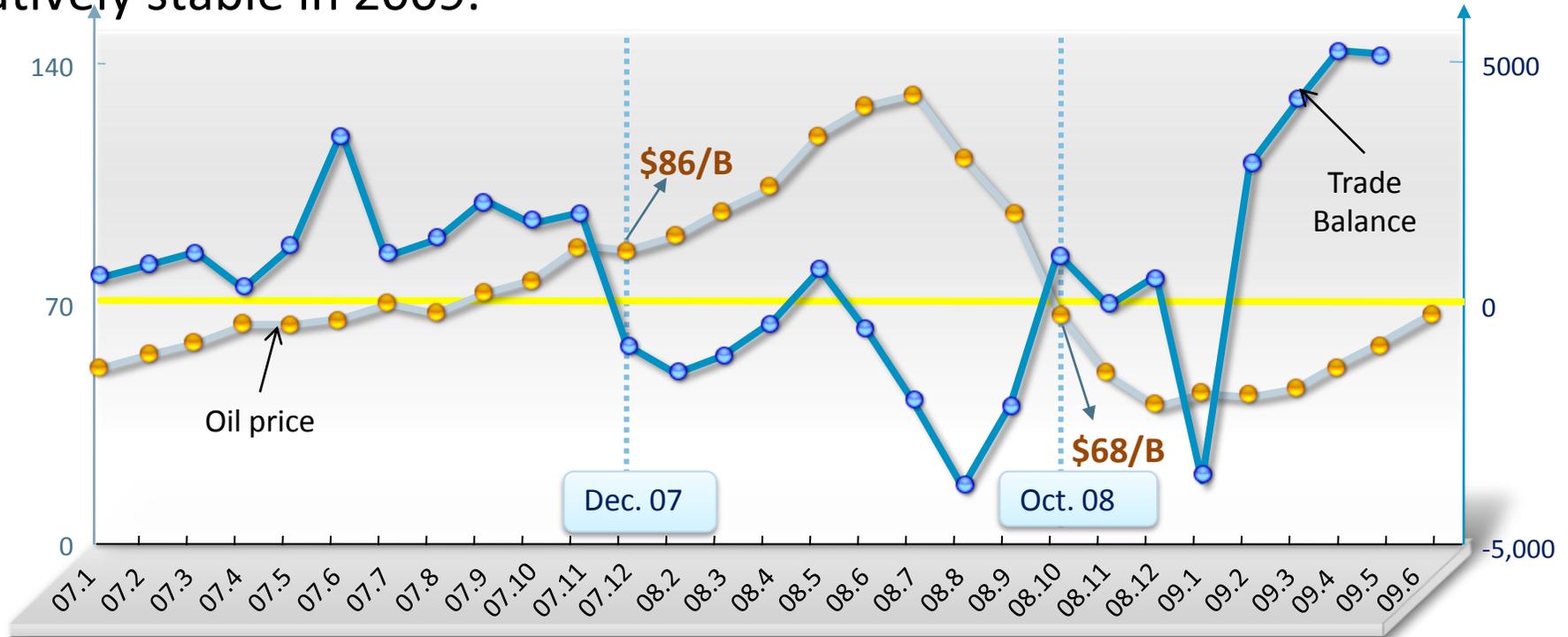
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# I. BACKGROUND (1)

Higher oil prices can adversely affect Korea's trade balance even if they are relatively stable in 2009.



- OPEC's reduction of oil production and the confidence on economic recovery allow oil prices to increase over \$ 70/B in 2009.
- In the long-term, oil prices are likely to stay high because of developing countries' growing demand.

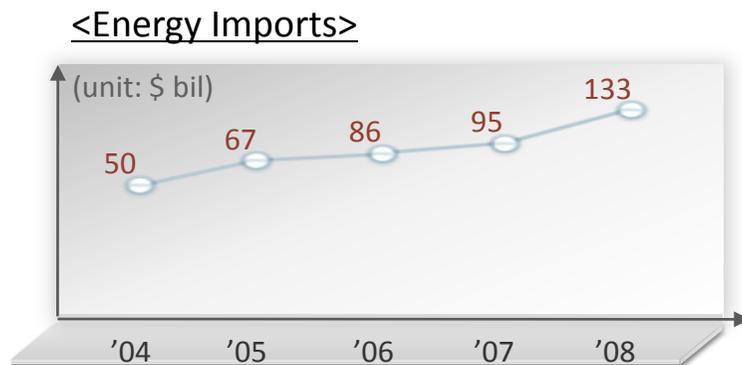
# I. BACKGROUND (2)

Strong energy saving policies are necessary to relieve higher oil prices' adverse impact on Korean Economy and to overcome the vulnerability due to Korea's high dependence on energy import.

## Dependence of Energy on Overseas

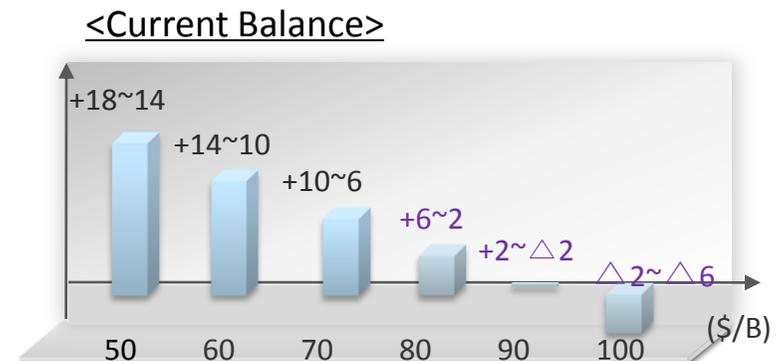
- Korea imported \$ 133 bil of energy, meaning that it depended 97% of energy on foreign countries.
- Korea spent a third of its export earnings on imported energy

\* Korea's total exports in 2008: \$ 422 bil



## Current Balance & Oil Price

- Korea Development Institute (KDI) expects 10% increase in oil prices will decrease.
  - trade balance by \$ 2 bil
  - consumption by 0.1 ~ 0.2%
  - GDP by 0.2%



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## II. ENERGY CONSUMPTION TREND IN KOREA (1)

Korea's energy intensity (Energy Consumption/GDP) is improving at a fast pace, but it is higher than that of the other OECD countries because of the concentration of energy consuming industries.

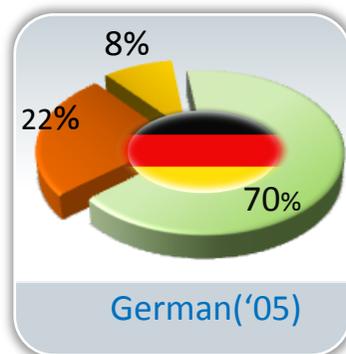
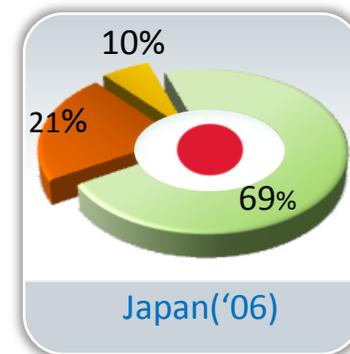
### Energy Intensity

Country	Energy Intensity*	Growth**
Korea	0.323	-2.40
US	0.206	-2.27
Japan	0.104	-1.56
UK	0.137	-2.74
German	0.173	-0.69
France	0.186	-0.69
Canada	0.319	-1.37
OECD	0.206	-1.50

\*Energy Intensity = TOE / thd USD

\*\* Growth = annual percentage growth rate  
from 2000 to 2007

### Industry Structure



■ manufacturing ■ Other ■ Service

## II. ENERGY CONSUMPTION TREND IN KOREA (2)

Industry Sector consumes energy the most among major sectors (industry, home, and transportation), but the consumption except naphtha has been decreasing for the recent years.

### Sectoral Energy Use

	Portion (07)	Annual Growth (00-07)	Compared with Others	Reason
Industry	 <p>58%</p>	<p>3.2%</p> <p>(<math>\Delta</math>0.06%, excluding naphtha)</p>	<p>&lt;Sector's Portion&gt;</p>  <p>58 32 28</p>	<ul style="list-style-type: none"> <li>• persistent investment for energy efficiency</li> </ul>
Home	 <p>20%</p>	<p>1.5%</p>	<p>&lt;Consumption/Capita&gt;</p>  <p>3.9 -0.2 -1.6</p>	<p>Annual Growth (00-06)</p> <ul style="list-style-type: none"> <li>• lower consumption level</li> <li>• lower energy prices</li> </ul>
Transportation	 <p>19%</p>	<p>2.6%</p>	<p>&lt;Consumption/Capita&gt;</p>  <p>2.2 -0.7 1.0</p>	<p>Annual Growth (00-06)</p> <ul style="list-style-type: none"> <li>• lower consumption level</li> <li>• increasing # of cars &amp; distance/car</li> </ul>

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# III. EVALUATION ON PAST ENERGY POLICIES (1)

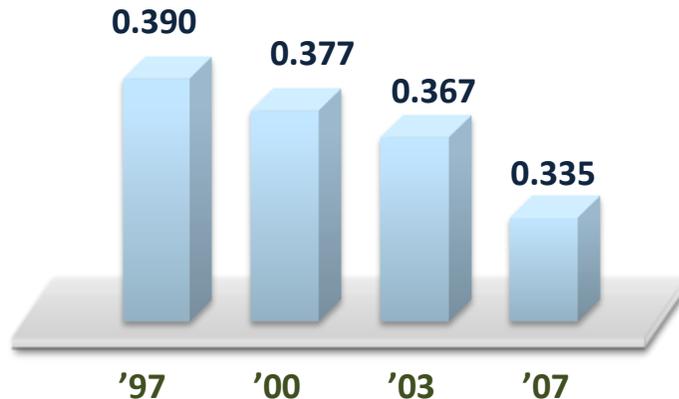
Since Korea adopted various energy policies, The energy efficiency has been improved, however, the energy consumption has increased at higher rate than OECD countries’.

## Energy Intensity

- The energy intensity (= TOE/thd USD) has decreased from 0.390 in 1997 to 0.335 in 2007.
- The growth of the GDP has been higher than that of the energy consumption since 2000.
- Annual Growth Rate ('97~'07):

GDP (4.3%), Energy Consumption (2.7%)

<Energy Intensity>



## Reason

- Annual Growth Rate of Energy Consumption: 2.73%

<Energy Consumption Growth, '97~'07>



- “Low energy price” policy prevents Korean people and companies from saving energy actively.
- Although home and transportation sectors’ energy consumption has increased rapidly, energy saving measures usually focus on industry sector.

# III. EVALUATION ON PAST ENERGY POLICIES (2)

Even if Korea successfully implements current measures for enhancing energy efficiency, it would be unlikely to achieve OECD countries' energy intensity level due to energy consuming industrial structure.

## Industry Structure

- Korea's potential to reduce energy consumption would be small as energy consuming industries such as petro-chemistry and steel account for 38% of Korea's industrial energy consumption.

<Petro-chemistry & Steel / Total Industry ('08)>



38.4%



11.1%

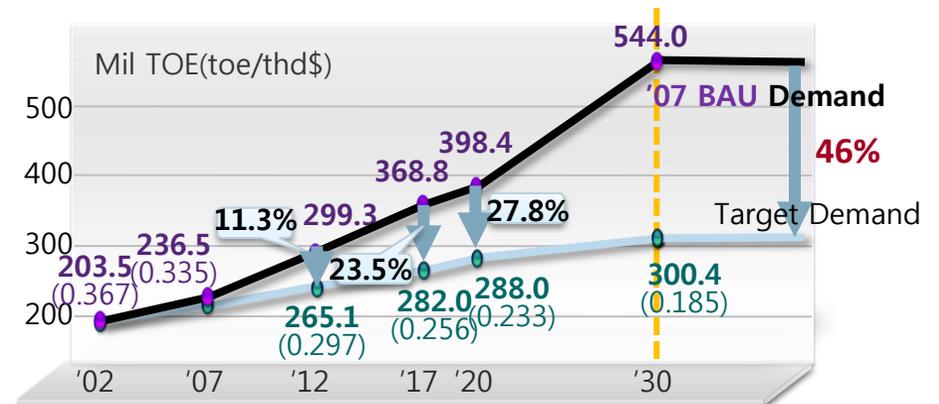


15.4%



21.7%

## Target Energy Intensity <sup>1)</sup>



- Korea aims to enhance the energy intensity 46% by 2030 (2.6% annually), the figure being higher than that of Germany, which has shown the highest improvement (1.8% annually).
- However, the target energy intensity is higher than the current energy intensities of Japan (0.104), and German (0.173).

1) National Energy Plan, 2008, National Energy Committee, Korea

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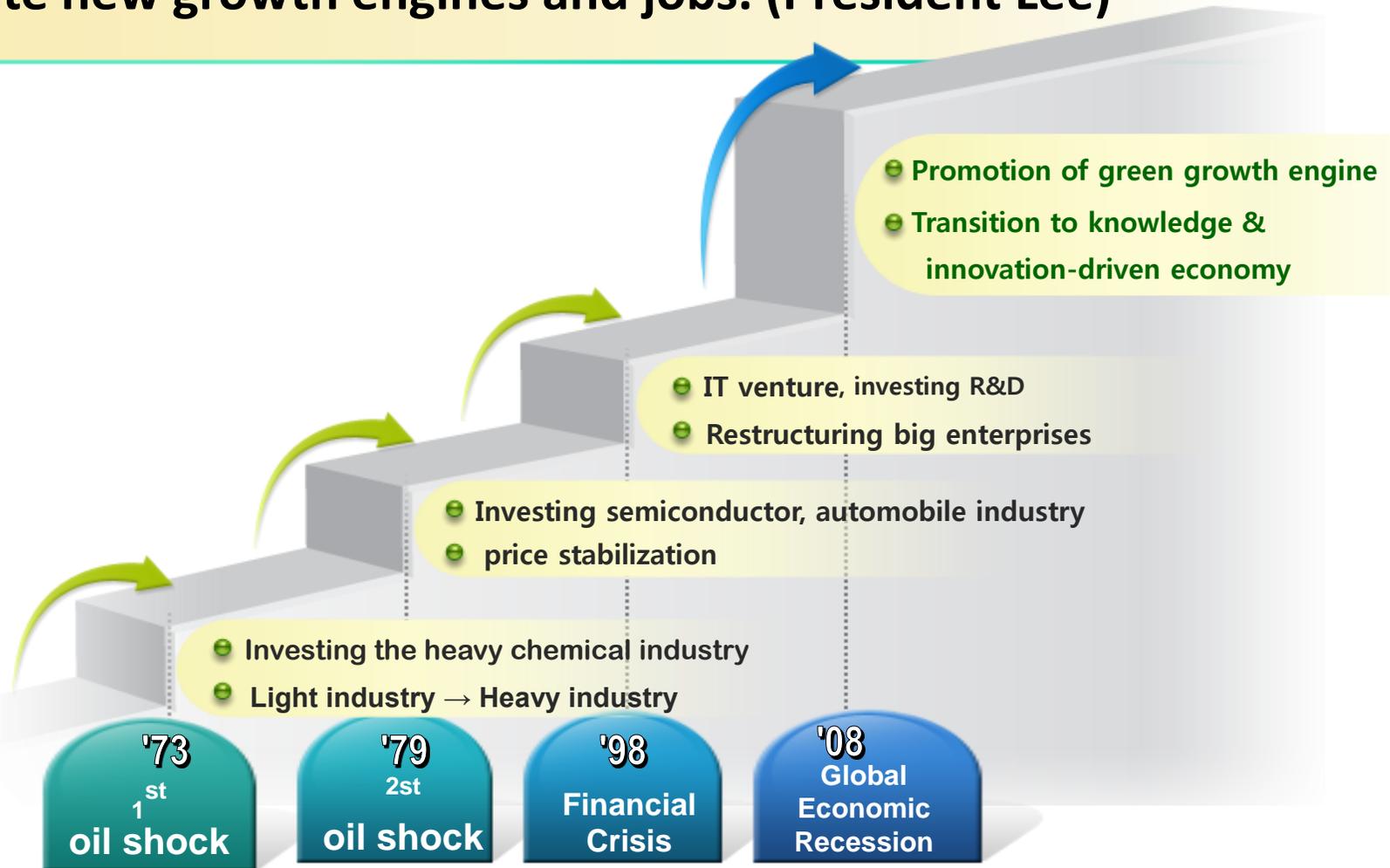
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# IV. PARADIGM SHIFT IN ENERGY POLICY (1)

Green Growth is a “New National Development Paradigm” that create new growth engines and jobs. (President Lee)



# IV. PARADIGM SHIFT IN ENERGY POLICY (2)

## New Vision for Low Carbon & Green Growth

Stand up as a Global Green Energy Industry Leader

Reduce  
Energy  
Consumption

- Improve energy efficiency 46% by 2030
- Energy Intensity : (08)0.335 → (30) 0.185

Raise  
the use of Green  
Energy

- Renewable : (08) 2.5% → (30) 11%
- Nuclear : (08) 14.9% → (30) 27.8%

Foster  
Green Energy  
Industry

- Increase R&D investment
- Select 15 key technologies

Low Carbon Society

# IV. PARADIGM SHIFT IN ENERGY POLICY (3)

## Basic Act on Low Carbon Green Growth(2009.12)

### Composition

- 7 chapters and 65 articles
- a basic act – it has priority over all relevant laws regarding Green Growth

### Key provisions

- 1) legal ground for the **Presidential Committee on Green Growth** and mandates the committee to develop a **national strategy for Green Growth**.
- 2) mandates the government to **foster and support green economy, green industry, and the transformation of conventional industry**.
- 3) foster **financing for green technology R&D and green investment**, as well as, mandates to promote **environment friendly tax reform**.
- 4) mandates government to set concrete **targets for GHG emission reduction**, energy saving, energy security, and renewable energy supply.
- 5) mandates for mandatory **reporting of GHG emission** for businesses. Provides the legal framework to introduce **cap & trade system** in Korea.
- 6) articles on environment-friendly **land use, green building, low carbon transportation, green consumption and production**, and other issues related to sustainable development.

# IV. PARADIGM SHIFT IN ENERGY POLICY(4)

Korean Government is systemizing the measures on energy demand with Energy Efficiency Policy.

	Past Energy Policy	New Paradigm for Green Growth Era
<b>Policy Focus</b>	<ul style="list-style-type: none"><li>•Stable &amp; safe energy supply</li></ul>	<ul style="list-style-type: none"><li>•Active management of Energy Demand</li></ul>
<b>System</b>	<ul style="list-style-type: none"><li>•Irregular measures for energy saving</li></ul>	<ul style="list-style-type: none"><li>•Quarterly checking energy imports and consumption</li><li>•Setting up energy saving target by sector</li></ul>
<b>Risk Management</b>	<ul style="list-style-type: none"><li>•Untimely</li><li>•Not enough measures</li></ul>	<ul style="list-style-type: none"><li>•To be timely, preparing regulations which can be enforced when necessary</li></ul>
<b>Energy Price</b>	<ul style="list-style-type: none"><li>•Maintaining low energy prices for commoners</li></ul>	<ul style="list-style-type: none"><li>•Properly reflecting on energy costs</li></ul>
<b>Motivation</b>	<ul style="list-style-type: none"><li>•Campaign, education, event, etc.</li></ul>	<ul style="list-style-type: none"><li>•Preparing policy mix of regulations &amp; incentives for saving energy in daily life</li></ul>

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# V – 1. ESTABLISHMENT OF NATIONAL ENERGY DEMAND AND SUPPLY MANAGEMENT SYSTEM

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Besides the stable energy supply, Korean Government will manage the energy demand as close as the current balance and also strengthen administrative supports.

## Regular Reporting System

- Annually establishing “National Energy Demand Forecast and Supply Plan” and reporting it to Cabinet Meeting
  - Including the consumptions and saving plans by sector and energy resource

## Competition by Ministries

- Setting up the energy saving target led by each Ministry
  - The performance of each ministry will be reported to the President

## Close Check of Import & Consumption

- Report energy consumption and import on a quarterly basis
- Preparing for super-high oil prices with immediate measures such as enforcing consumption limit

## Enhanced Administrative Supports

- launched a new organization, Energy Efficiency Bureau in the competent Ministry (MKE)
- Initiated a new division specializing in energy efficiency in each Ministry

# V – 2. IMPROVEMENT OF FUEL EFFICIENCY

Intensified regulations and incentives will be provided to enhance the average fuel efficiency of cars.

	As-is	To-be
<b>Fuel Efficiency Standard</b>	<ul style="list-style-type: none"><li>• Current Standard (<i>km/l</i>):<ul style="list-style-type: none"><li>- 12.4 (below-1,600cc) / 9.6 (over-1,600cc)</li></ul></li><li>• Other Countries' Standard:<ul style="list-style-type: none"><li>- the US: 11.7 (16.6 since 2016)</li><li>- Japan: 6.4~21.2 (7.4~22.5 since 2015)</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Increase the standard by 16.5% since 2012<ul style="list-style-type: none"><li>- 14.5 (below-1,600cc) / 11.2 (over-1,600cc)</li></ul></li><li>• Strengthening penalties by including fines</li></ul>
<b>R&amp;D Green Car</b>	<ul style="list-style-type: none"><li>• R&amp;D focusing on hybrid car</li></ul>	<ul style="list-style-type: none"><li>• Aiming to improve fuel efficiency by 5% annually (tire, light material, eco-driving)</li><li>• Promoting collaboration among car manufacturers and part suppliers</li></ul>
<b>Eco-driving Package</b>	<ul style="list-style-type: none"><li>• Package composition<ul style="list-style-type: none"><li>- Tire Pressure Monitoring System (TPMS)</li><li>- Eco-driving Guidance</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Strongly recommending the package to be equipped</li><li>• Expecting 8% improvement</li></ul>

# V – 3. ENERGY SAVING IN HOME & BUILDING SECTOR (1)

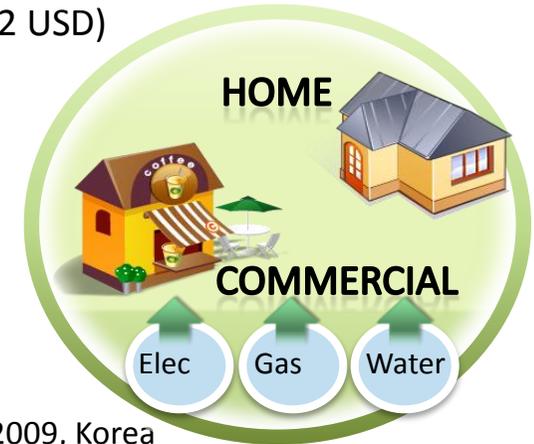
Korean Government is adopting more active policies of tax and incentive system for more energy-efficient life at home.

## Promotion of Energy-efficient Goods

- Tax: increasing tax on energy consuming home appliances
- Promotion: using increase in tax revenues for subsidizing low-income people to purchase goods with high energy efficiency

## Expanding Carbon Point <sup>1)</sup>

- Ministry of Environment (ME) provides Carbon Points according to activities to reduce GHG.
- Pilot project is applied to 20 local governments such as Suwon city
- Carbon Point is expanded national-widely in 2010.
- 10Kg (23.6KWh of electricity) = 1 point  
= 200 ~ 500 KRW (= 0.2 USD)



1) Ministry of Environment, 2009, Korea

# V – 3. ENERGY SAVING IN HOME & BUILDING SECTOR (2)

To improve energy efficiency of buildings and houses, tax system and subsidies for low-income people are being strengthened.

## Incentive & Regulation to Building

### Incentives

- Relieving regulations on floor space index, height, and landscape requirements by max 6%
- Exempting local tax

### Regulation

- Must be equipped with cutoff system of standby electronic power
- Must announce the degree of energy efficiency
- Must limit energy consumption per space

## Support for Low-income People

- Supporting for improving boilers, heat insulators, and window & doors
- Increasing Lottery Fund to extend beneficiaries (budget: \$ 30 mil/70 thousand household)



# V – 4. ENERGY SAVING IN INDUSTRY SECTOR(1)

Stronger and direct regulations will be required to larger energy consuming companies.

## Regulation

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### Negotiated Agreements For Energy & Carbon

- Government and companies will negotiate the energy saving targets
- Whether the companies succeed in achieving the targets, penalties or incentives will be provided
- Pilot project: 38 companies (2009.12)  
(2010) 50 companies, 500,000 TOE, 35% of industry sector  
(2011) 200 companies, 50,000 TOE, 50%  
(2012) 400 companies, 20,000 TOE, 54%

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### Energy Manager

- Large companies must hire “Energy Manager” with a license regarding to energy efficiency.(2010.3)
- 3,000 companies, 2,000TOE

# V – 4. ENERGY SAVING IN INDUSTRY SECTOR(2)

Supports and incentives will be provided for small and medium sized enterprises.

## Support

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### Energy Supporter

- A supporter is designated for 805 small-and-medium sized companies (SMEs).
- The supporter with a license regarding to energy saving , helps SMEs establish energy plans and purchase energy saving equipments.

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### Free Energy Check

- Energy Management Corp. is checking the energy consumption status of 10,000 SMEs and find solutions for improving efficiency.
- Government is supporting the 2,100 SMEs by providing low interest loan program.

# V – 4. ENERGY SAVING IN INDUSTRY SECTOR(3)

In terms of energy efficiency, low efficiency products should be replaced with top runners, and the supports for R&D of energy saving technologies would become reinforced.

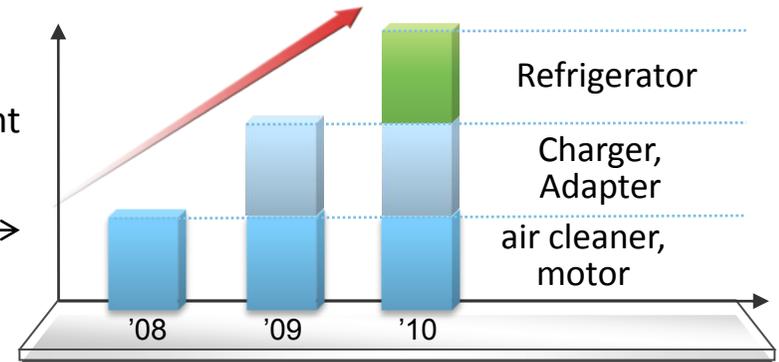
## Plan

### Top Runner of appliances

- concept: promoting appliances to become as energy-efficient as the most efficient products
- 2010: pilot project on air conditioner -> reviewing the feasibility of applying top runner to others such as refrigerator and washer

### Retiring Product with Lowest Efficiency

- Phasing out glow lamps by 2013
- Heightening the energy efficiency requirement
- expanding products which the requirement is applied to →
- Attentive Label on high standby electricity products: computer, set-top box. etc ('09)



### R&D Support

- 4 year 50% corporate tax cut for SMEs to develop energy saving technologies
- Selecting 7 energy consuming facilities to focus on R&D resources (boiler, motor, light, home appliance, etc.)
- improving generation efficiency from 38% in 2008 to 40% in 2010

# V – 5. ENERGY SAVING IN PUBLIC SECTOR

Although the public sector spends only 2% of the total energy, stronger regulations are enforced to the sector to show the leadership of energy saving.

## Green Government Complex

**Obligation  
of  
Purchasing  
1<sup>st</sup> Grade  
Product**



5,694 authorities

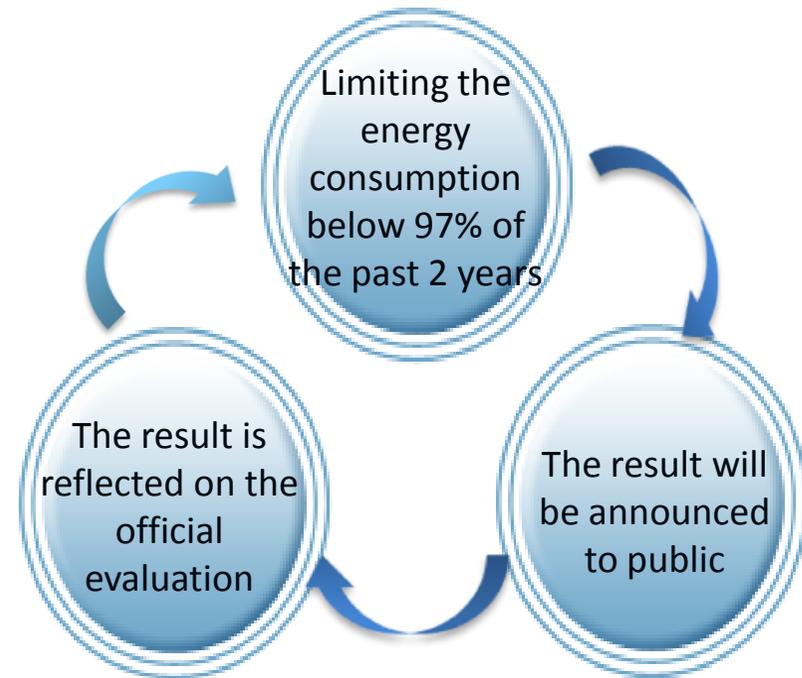


16 products

**Green  
Complex**

- Replacing LEDs for 30% of lightening system by 2012
- Local government should construct energy saving plan and target.

## 3% Saving Target



# V – 6. NORMALIZING MARKET FUNCTION WITH ENERGY PRICES

To recover the function of the energy market, Korean Government will increase the prices and help people recognize their costs more clearly.

## Energy Price

### Normalizing Electricity & City Gas Price

- reflecting appropriate production costs
- Electricity: constructing “Price Schedule Improvement Plan”
- City Gas: linking the price with the costs

### Changing the Pricing Mechanism

- As-Is: fixed by Government
- To-Be: reflecting the resource prices
- Expectation: when high oil prices, the energy demand would be oppressed such that the current balance would be improved

## Price information

### Reforming Bill Papers

- Additional Information:
  - price/unit, consumption growth, energy consumption composite, etc

### IT Application

- Spreading smart voltameters
  - 8,000 households ('09)
  - > 20,000 households('10)
  - obligation to new constructions

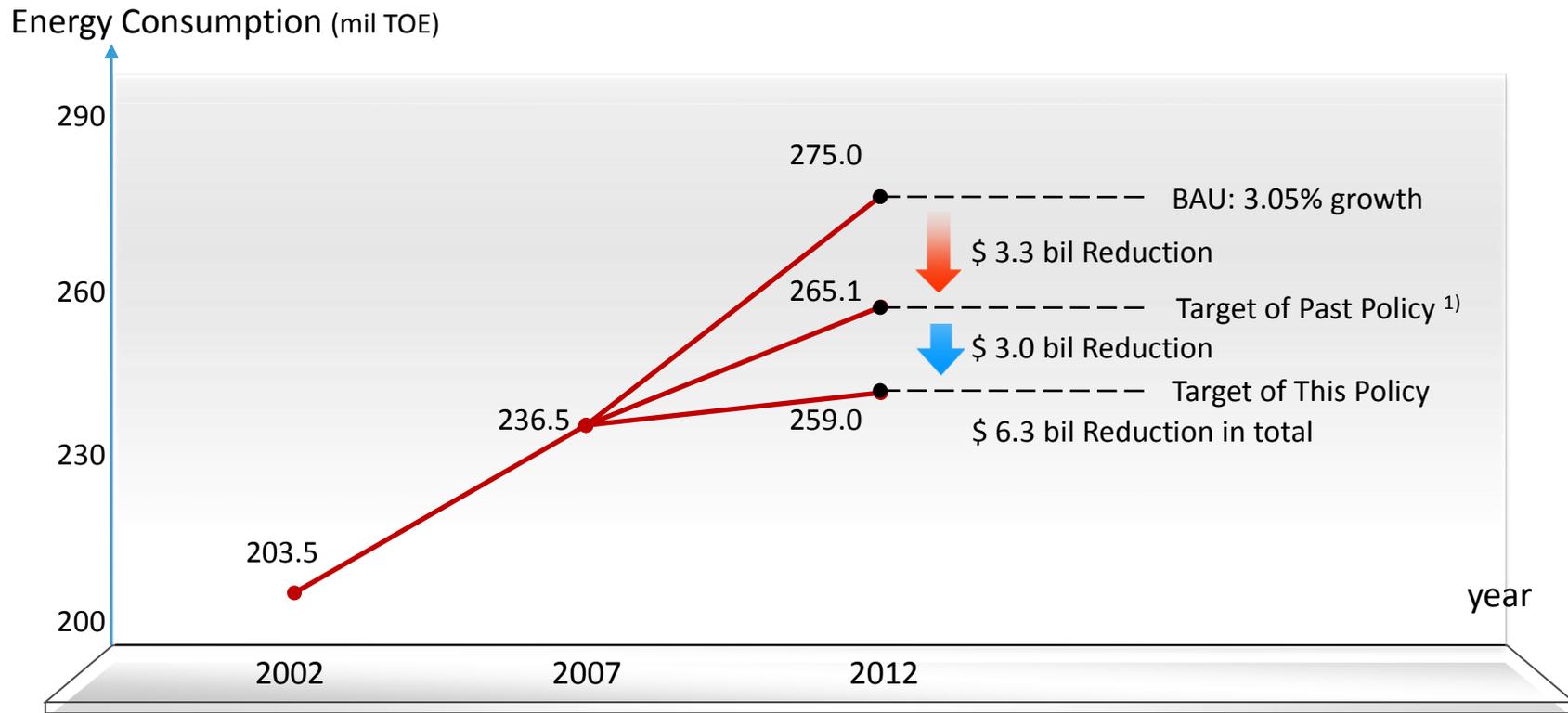
### Changing Energy Efficiency Label

- Including expected energy costs



# V – 7. EXPECTED RESULTS

The Energy Demand Management Policy is likely to reduce additional 6.1 million TOE of the energy consumption in 2012 (equivalently, increasing \$ 3 billion in the trade balance).



1) Energy Use Rationalization Plan, 2008, MKE

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**| The End**

**Q & A**

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