

# Low Carbon Green Growth Policy in Korea

**Oct 2009**



**Ministry of Environment  
Republic of Korea**

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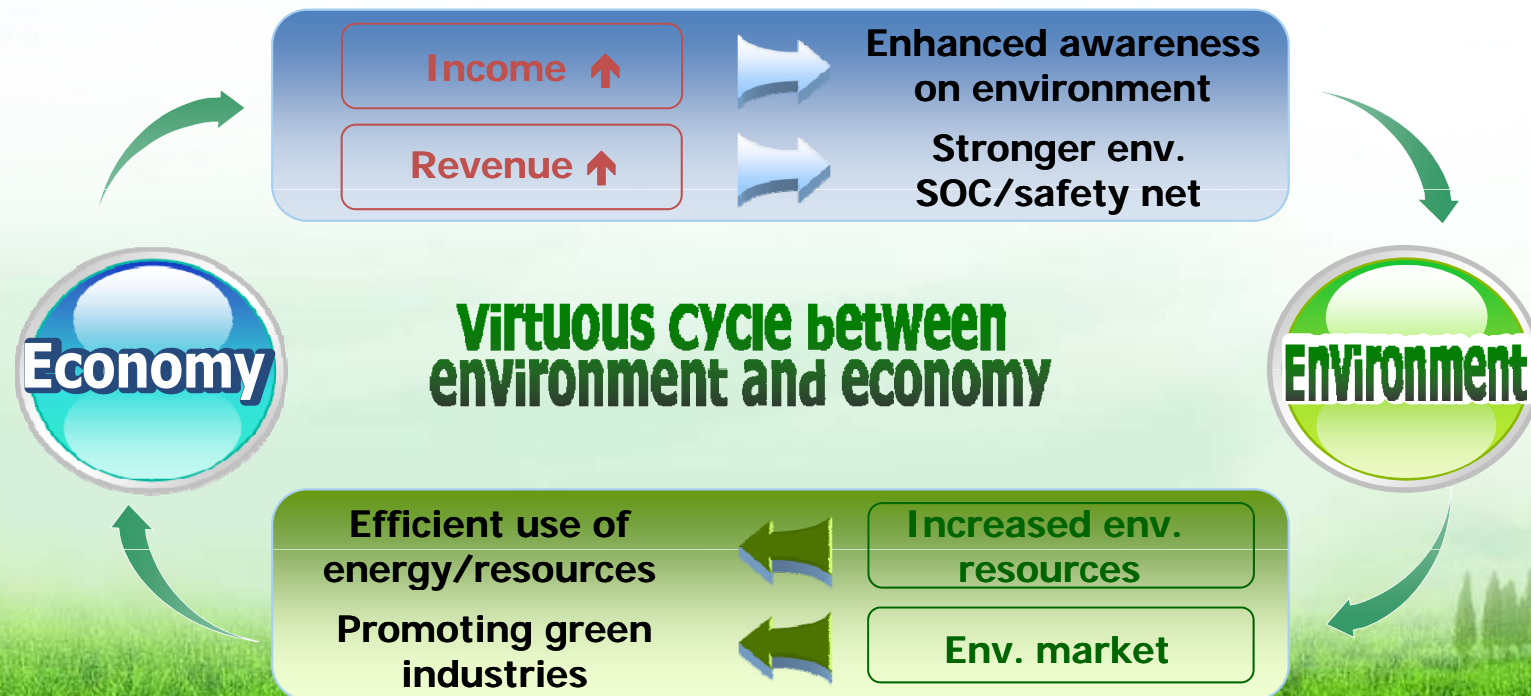
# **I. Concept & Strategy of Green Growth**

# What is Green Growth?



**Sustainable development** to reduce greenhouse gas emissions and pollution, and **new paradigm** for national growth to create **growth engines** and jobs utilizing green technology and clean energy!

- ✓ Economic growth that improves environment (decoupling of economic growth and environmental degradation)
- ✓ To enhance environment-friendly economic activities, and create new markets



# Core Elements of Green Growth



- **Minimize energy use** while maintaining robust growth

\* 2006 global energy efficiency comparison (unit: TOE/\$1000GDP (based on ppp))

Korea	USA	Japan	OECD Average
0.23	0.21	0.15	0.18

- **Minimize pollution (GHG and etc.)** using same energy sources

\* GHG emissions per GDP in 2005 (Unit : CO2 ton/\$1000 GDP (based on ppp), IEA)

Korea	USA	Japan	China
0.469	0.529	0.350	0.633

- **Develop green technology** and **environment-friendly industry** as new growth engines

\* To expand investment in green technology development, to foster environment-friendly, advanced industries, to green existing industries, and to prepare institutional foundation to transfer into green economy (green finance, streamline regulations, green tax reform, development of human resources, etc.)

- **Expand education** on sustainable green growth, green lifestyle and culture

# Why Green Growth?



**"Green growth is not an option, but mandatory..."**

## Conditions home & abroad

Worse environmental crisis  
due to climate change

Imbalance in energy  
supply & demand,  
serious resource depletion

Continuous increase of  
energy demand increased  
dependence on imports

Increased GHG emissions  
Due to fossil fuel oriented  
structure

Weaken economic growth  
and growth engine

International community is...

*Competing in a heated Green Race to  
take over green market earlier!*

Green  
Growth

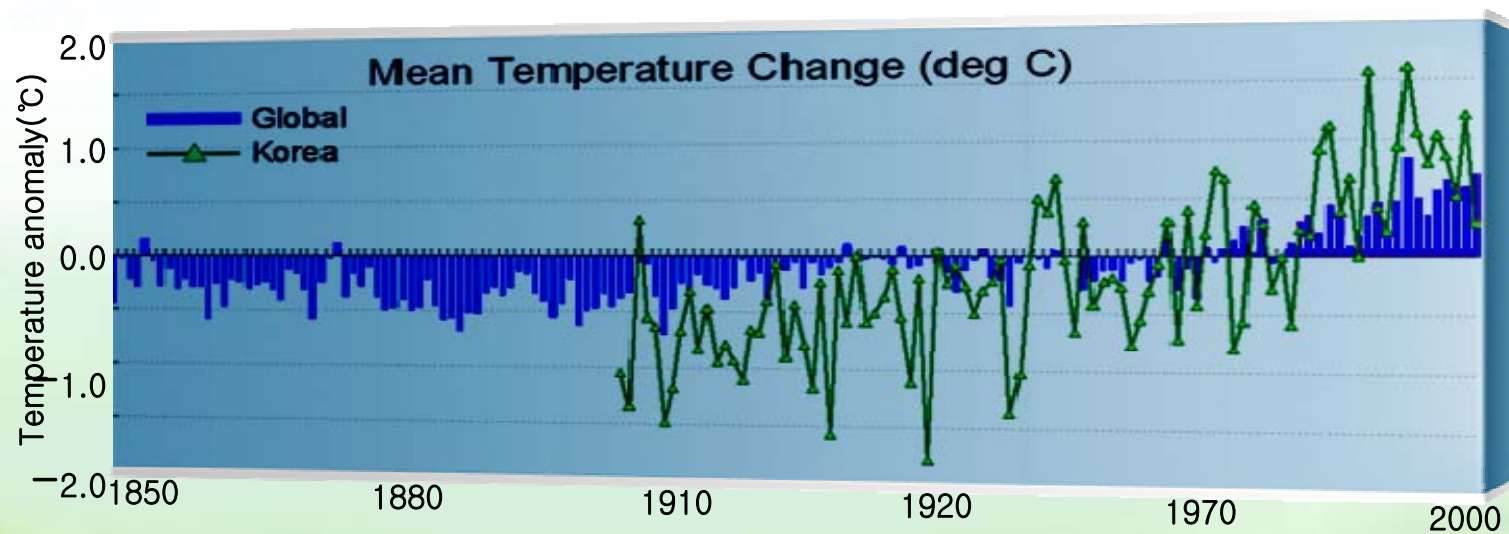
Korea is...

*Required to address  
environmental · resource crisis and  
create new growth engine*

# Climate Change in Korea



- Average temp. rise **1.7°C**(6 cities) in past 100 years
- **Winter - shorter** by a month;  
**Summer - longer** by 20 days (compared to 1920s)
- **More occurrence of typhoons** (damage cost rose 3 folds in last 10 years)
- **Torrential rainfall** : 2.8 days in a year (0.8 day increase in last 10 years)



# Unsustainable Facts & Challenges



Available reserves of natural resources (oil 40yrs, gas 58yrs copper 28yrs)



Imminent depletion of resources

World Resource Institute

Per capita supply of fresh water will decrease by a third within 25yrs.

Difficulty in irrigation for increase of food production

Worse water shortage

UN World Water Development Report

5-20% decrease of world GDP with business as usual (The 2<sup>nd</sup> Great Depression?)



Continued GHG emissions

Stern Review

50% increase of global energy consumption by 2030



Increased energy consumption

IEA



## **II. Vision and Policy Measures**



# Vision and Mechanism



Vision of Low Carbon Green Growth :

*Virtuous Circle of Environmental Conservation and Economic Growth*

3 Strategies and 10 tasks

## Climate Change Response & Energy Independence

- 1 Low carbon society
- 2 Non-oil · energy independence
- 3 Capacity to address climate change

## Create New Growth Engine

- 4 Green technology as growth engine
- 5 Greening industries & Fostering green industry
- 6 Innovation of industrial structure
- 7 Foundation for green economy

## Improve Quality of Life & Enhance National Status

- 8 Green land & transport
- 9 Green revolution in lifestyle
- 10 Global model nation for green growth

# Policy Measures for Green Growth



- Expand national green R&D
- Expand green job projects
- Expand share of green growth budget in stimulus package



- Introduce Renewable Portfolio Standards (RPS)
- Regulate GHG emissions from vehicles
- Expand energy efficiency labeling

## *Policy Measures for Green Growth*



- Induce lifestyle changes in clothing, eating and living - bicycle, eco-driving, public transportation
- Provide incentives such as carbon mileage



- Carbon tax, environment-related charges
- Emission trade system

- Provide support low-GHG emitting products / charge for high-emitting products
- Provide subsidies on power generation using renewable energy

The background features a blue sky with white clouds at the top, transitioning into a light green and white gradient. Three wavy, translucent lines in shades of green and blue sweep across the middle. At the bottom, a city skyline with various skyscrapers is visible. Three green leaves are scattered on the right side of the page.

## **III. 3 Strategies and 10 Core Policies**



## Strategy 1. Climate Change Response and Energy Independence

- **Low Carbon Society**  
Establish a society that reduces, absorbs, and circulates carbon
- **Oil Free and Energy Independence**  
Develop/diffuse renewable energy, & energy-saving/high-efficiency devices
- **Capacity for Climate Change Adaptation**  
Minimize climate change related risks by enhancing capacity for climate change prediction and adaptation

# (1) Efficient GHG Reduction



Target : Implement strategies to reduce emissions in each sector (households, industries, etc.) in full swing (from 2010)



## (2) Oil Free & Energy Dependence



Target: Realize 100% of energy independence by 2050

### Enhance energy efficiency and manage demand

- Eliminate energy-inefficient devices : ('13) Eliminate incandescent light bulbs
- Energy consumption rate: ('09) 0.32 → ('13) 0.29 toe/1,000\$
- Energy goal management system: ('09) established a legal basis



### Expand infrastructure for overseas resource development

- Independent development of oil & gas: ('09)7.4→('13)20%

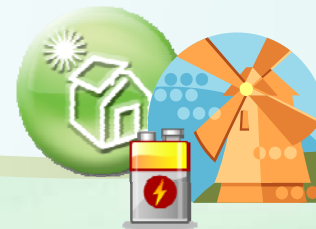
### Increase reliability and proportion of nuclear plant

- Export the first nuclear power plant within the planned period (Unit 1-2)
- Complete development of dependent nuclear power generation technology ('12)



### Promote commercialization of renewable energy

- Use of renewable energy: ('09)2.7→('13)3.8%
- Increase conversion of wastes and biomass into energy
- Green Home project: ('20)100 million units

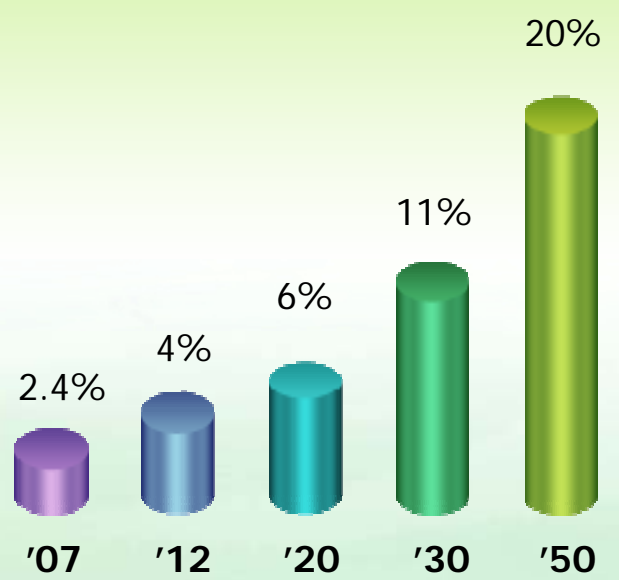




# Renewable energy target and tidal power generation

## Target of renewable energy dissemination

- Expansion of renewable energy use



## Uldolmok tidal power generation



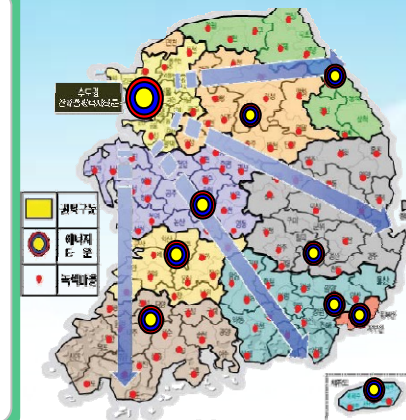
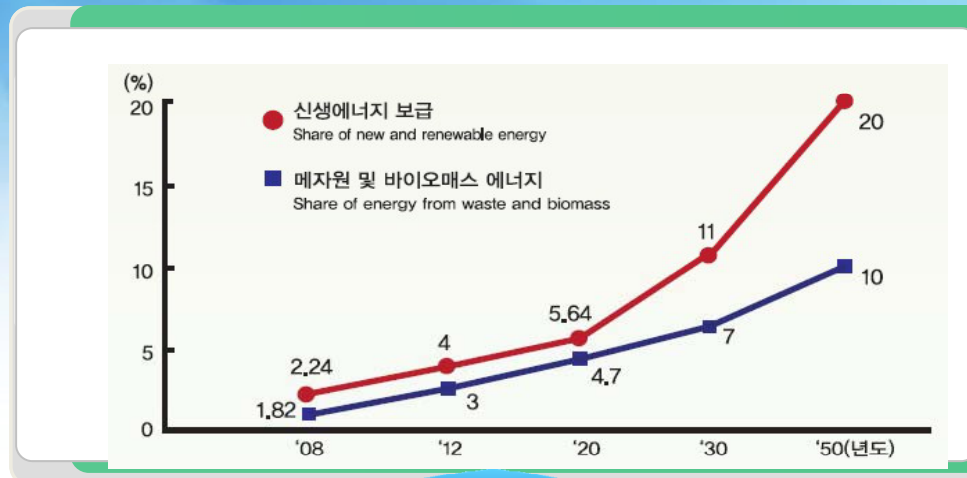
- 2009. 3 : Completion of pilot power plant
- 2013 : 90thou. kW commercial power plant

☆ Alternative energy: the 5<sup>th</sup> energy(saving, efficiency), renewable, clean, nuclear, fusion energy



# Conversion of wastes and biomass into energy

Will take up 7.12% of total energy by 2030



## Waste to energy

- Combustible wastes into refuse-derived-fuel
- Organic waste into biogas
- Recover landfill gases
- Recover heat from incinerators

## Biomass to energy

- Agricultural and forestry byproducts into fuels
- Form bio-cycle forest ('12, 10,000ha)
- Grow rapeseed in idle farmland ('12, 60,000ha)
- Fish processing byproducts into energy
- Build 600 low carbon green villages ('20)

## Sudokwon Complex

- Build an environment/energy complex in the Sudokwon landfill site by 2020
- Build complexes in each of the ten large zones across the nation based on the Sudokwon landfill site

# (3) Capacity for Climate Change Adaptation



◆ Secure 22.2m<sup>3</sup> of water resources by 2050



● Revitalization of 4 major rivers



● Maritime management & Disaster prevention system



● Improve soundness of forest ecology



● Climate change prediction technique and an early response system



● Lay the foundation for climate-friendly health care and food production

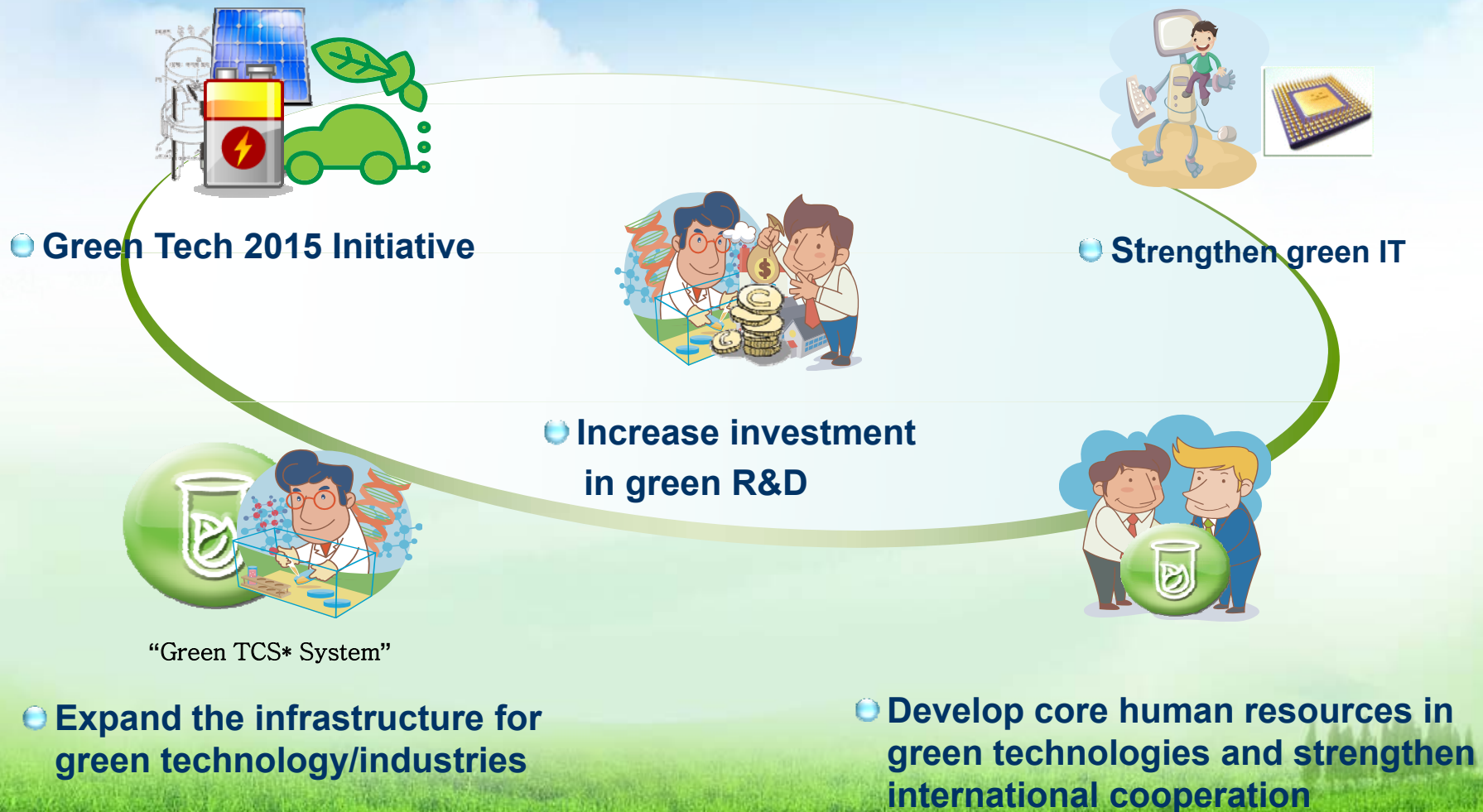
## Strategy 2. Create New Growth Engines

- **Green technology as growth engine**  
Expand development of green technology and support for commercialization
- **Greening industries & fostering green industry**  
Enhance energy/resource efficiency and saving in conventional industrial structure and production processes  
(Doing more with less)
- **Innovation of industrial structure**  
Transfer into knowledge-based industry, fusion industry and high value-added industries and support start-up companies
- **Foundation for green economy**  
Lay down foundation for green economy by developing ETS & green industry index, investing in green consumption & green jobs

# (4) Development green technology as new growth engine



*Target : "Increase proportion of investment in green technology to 30% by 2050"*



"Green TCS\* System"

# Environmental Technologies and Industries



## 10 major environmental technologies

Investment in R&D led by MOE  
: 197 ('09) → 400 billion won ('12)

1. Water treatment technology
2. Green car technology such as low emission engines
3. Climate change adaptation technology such as capture/storage of methane gas
4. Soil/groundwater pollution purification technology
5. Bio-resources use/restoration technology such as pollution purification using LMO
6. Technology based on environmental health such as health impact assessment of climate change
7. High value-added resource recovery technology
8. Convergence-based environment technology such as nanocatalyst for resource recovery
9. Technology to develop alternatives to GHG
10. Eco-friendly product technology in daily lives such as PVC and alternative to asbestos

## 10 major environmental industries

Exports of the environment industry  
: 1.3 ('07) → 8 trillion won ('12)

1. Environmental plants for water supply and sewerage
2. Green car industry
3. Carbon market
4. Meteorological industry
5. Urban mining
6. Soil purification industry
7. Bio-resources industry
8. Eco-tourism industry
9. Eco-friendly products industry
10. Environment consulting industry

# (5) Green Industries



*Target : "Increase the proportion of exports of green products to 35% by 2050"*



- **Green key industries and promote green management**



- **Expansion of green industrial complexes**



- **Strengthen green partnership among large and small- and medium-sized companies (Strengthen green capabilities of small and medium-sized companies)**

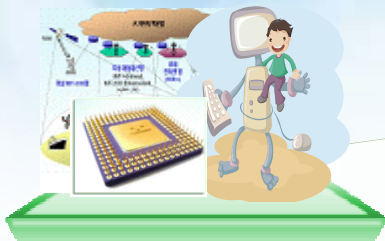


- **Establish a resource-circulating economic/industrial structure and boost urban mining**

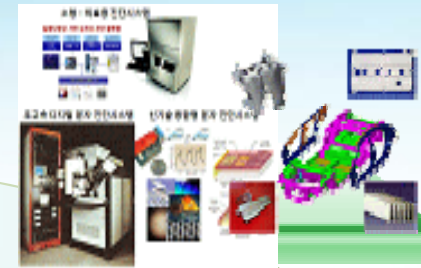
# (6) Advance industrial structure



*Target : "Increase exports of the IT convergence industry to 348.9 billion dollars by 2050"*



● Promotion of broadcasting & communications, IT, robot industries



● Advanced material, nanoconvergence, biopharmaceutical industries



● Develop contents and tourism as new growth engines

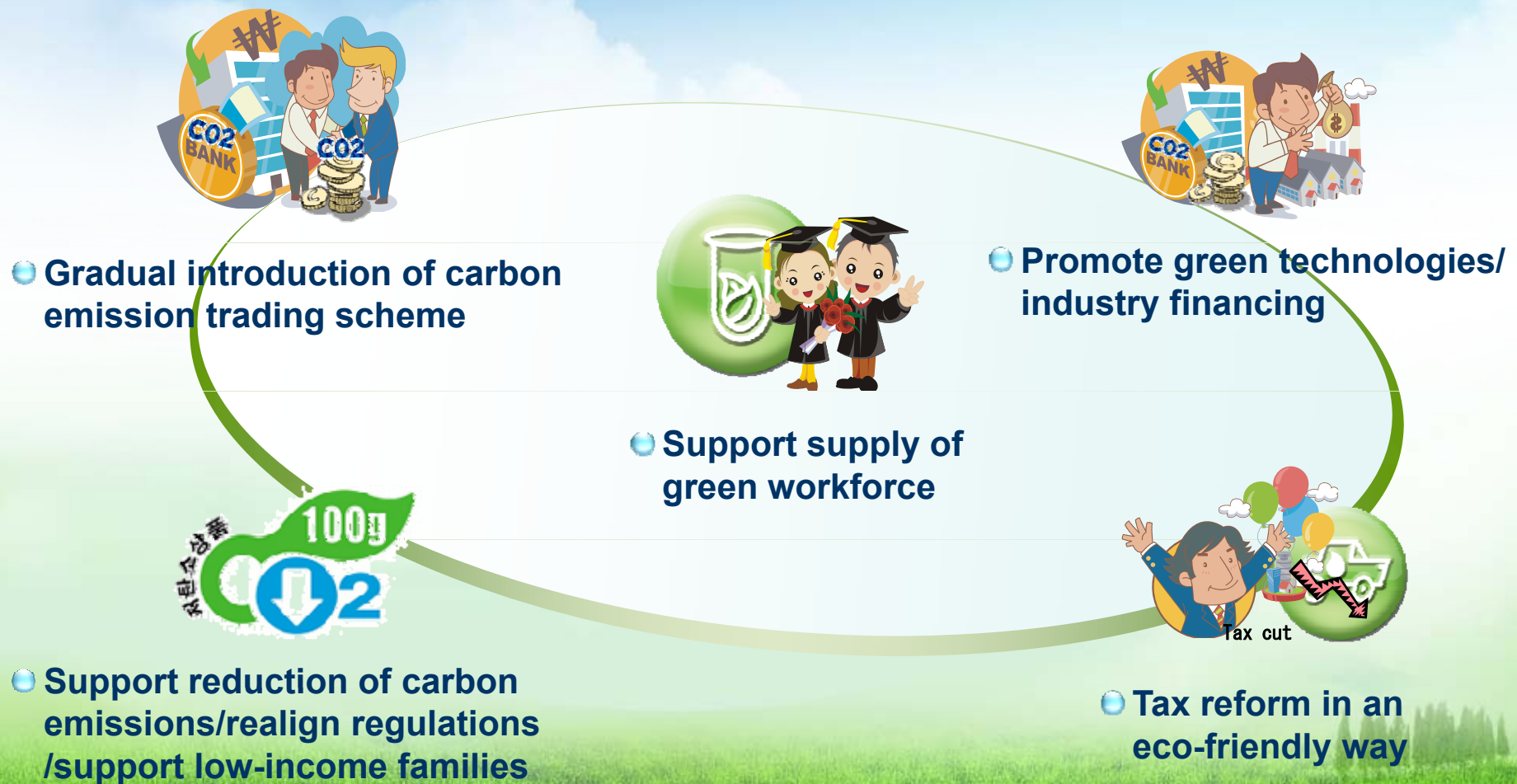


● Advance into a global healthcare and educational services powerhouse

# (7) Foundation for Green Economy/Institutions



*Target : "Increase the carbon market size to 5 trillion won by 2050"*





## **Strategy 3. Improve Quality of Life & Enhance National Status**

- **Green Land and Transportation**  
Greening land and living environment, green transport
- **Green Revolution**  
Low carbon green lifestyle, fostering leaders of green culture
- **Global Model Nation of Green Growth**  
Take responsibilities as a member of international community,  
secure Korea's position as a leader of green growth.

# (8) Green Land and Transportation



*Target : "Secure 10 model UN green cities by 2050 "*

● Create low carbon green forest and ecological rivers



● Promote green buildings



● Promote eco-friendly transportation



● Resource cycling regional development and expansion of green bases



● Promote use of bicycles

# (9) Green revolution in life (Green Start Movement)



*Target : "Increase carbon-labeling certified products to 4,000 by 2050"*

● Promote green consumption

● Increase green villages

● Nurture green leaders/families

● Develop/spread Korean-style eco-tourism models

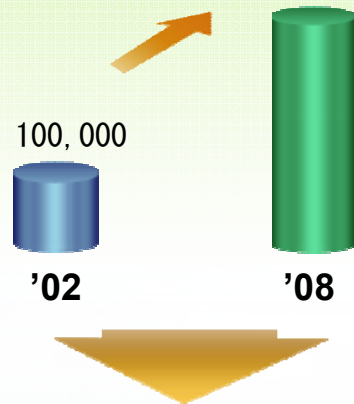


# Ecotourism



## Economic effects of Suncheon Bay ecotourism

● Increased tourists  
2.6 million



- Revitalize local restaurant/accommodation industries
- Increased employment of temporary workers

Create **6,400 jobs**  
a year

## Create ecological/cultural tour routes



# (10) Model Nation pursuing green growth

*Target : "Increase the proportion of green ODA to 40% by 2050"*



- A nation that helps developing nations with green growth



- A nation recognized as a model nation in pursuing green growth



- A nation that cooperates in global green growth



- Build Green Hub Korea



# (10) Necessary investment in green growth & Expected benefits

A total of **107.4 trillion won ('09 - '13)**

- Fiscal spending of 2% of GDP a year (UN : recommends invest 1% of GDP)
- Induce production of 182-206 trillion won/job creation of 1.5-1.8 million

	Total	2009	2010~2011	2012~2013	Increase rate
<b>Green growth</b>	<b>107.4</b>	<b>17.5</b>	<b>48.3</b>	<b>41.5</b>	<b>10.2%</b>

(Unit: trillion won)

**Tackle climate change /energy independence**

56.9

8.6

29.2

19.1

14.0%

**Create new growth engines**

28.6

4.8

10.8

13.1

9.4%

**Improve quality of life /enhance national status**

27.9

5.2

10.5

12.2

3.6%

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## **IV. Vision of Green Economic Power**

# Vision of Green Economic Power

*Aim to be in World's Top 7 Green Economic Powers by 2020*

## Effective reduction of GHG and systematic management

- Set and manage mid to long-term GHG reduction goals
- Effective reduction of GHG through introduction of carbon emission trading

(Management of GHG)

(Emissions Exchange)



## Establish global standing as a global leader of green growth

- A nation major international organizations related to green growth are located in (AFoCO, APCC)
- Center of hosting international organizations

(International organizations)

(International conferences)





## Enhance national competitiveness through promotion of green technologies and renewable energy

### Expand green businesses

- Expand the market of green businesses
  - LED, smart grid, carbon reducing energy, green transportation, etc.
- Promote use of renewable energy
  - Use of renewable energy: ('09) 2.7 → ('13) 4.0%



### Promote green technologies / industries

- Improve green technology
  - Global market share: ('09) 0.5 → ('13) 8%
  - Foster green small/venture businesses
  - Green SMEs: ('09) 0 → ('13) 1,000
- Develop green stock price index

(Increase green businesses) (Increase renewable energy) (Enhance green technology) (Green Stock Index)



*Establish a green foundation and put into practice green life*

**Promote green citizens/  
households/villages**

- **Increase use of energy-efficient devices**
  - Eliminate incandescent lights by 2013
- **Increase carbon labeling certified products**
- **Promote and establish green consumption and purchasing pattern**

(Promote energy efficient devices)

(Promote green consumption)



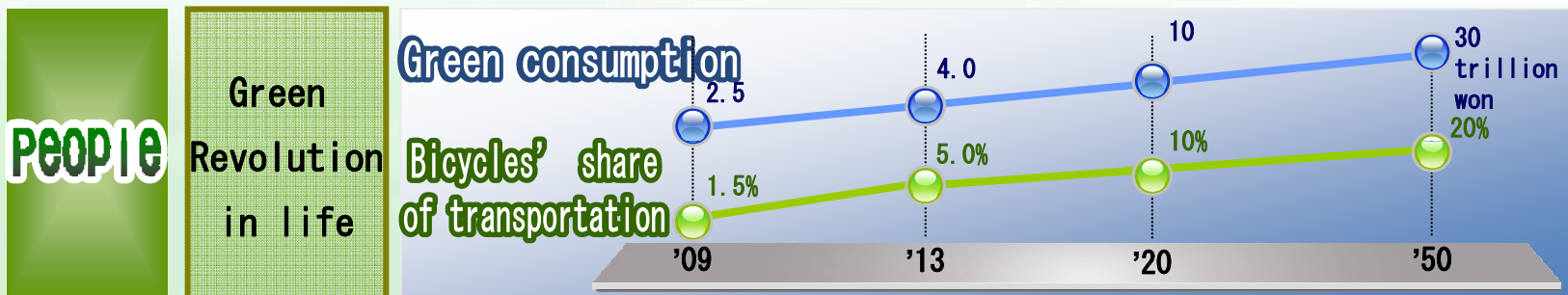
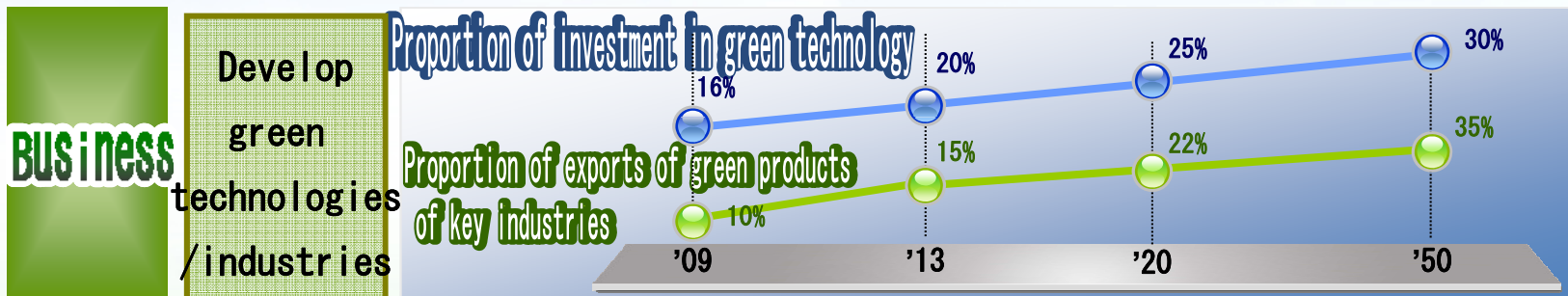
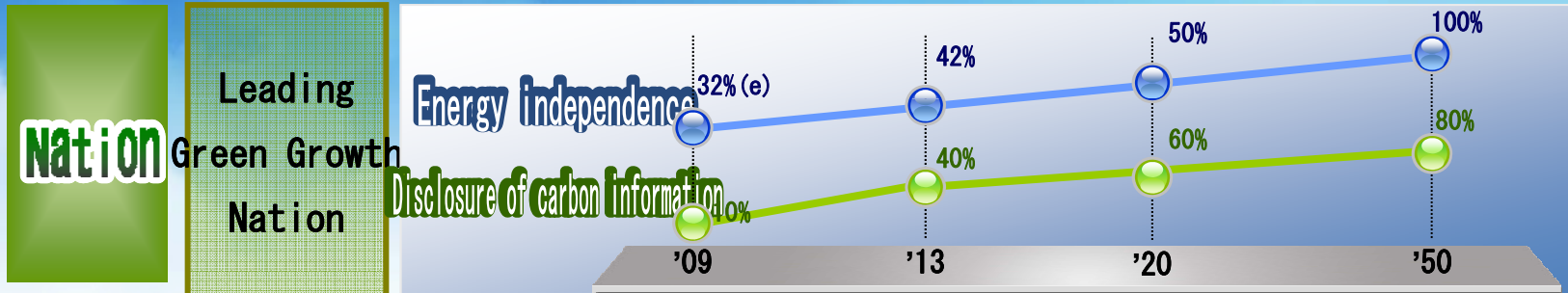
**Increase green land/architecture  
and eco-friendly transportation**

- **Increase green regional bases**
  - (4 major rivers, Saemangeum tidal flat, etc.)
- **Increase eco-friendly means of transportation such as railroads**
- **Increase and promote the use of bike roads**
  - Nationwide bicycle road network (3,114km)

(Revitalization of rivers)

(Green consumption)





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*“Green growth will enable a Miracle on the Korean Peninsula to succeed the Miracle on the Han River.*

*When we first manufactured our own vehicles, the technology gap with the advanced countries amounted to at least 50 years.*

*As far as semiconductors are concerned, it was more than 20 years behind.*

*However, Korea grew into a technology powerhouse, which ranks first in terms of producing semiconductors and ships, and fifth in automobiles.*

*If we make up our minds before others and take action, we will be able to lead green growth and take the initiative in a new civilization.”*

*– From President Lee Myung-bak’s speech on the National Liberation Day –*

**Thank you!**