



# **CLIMATE CHANGE POLICIES in KOREA**

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## Trends of GHGs Emissions by Sectors

(Unit: MTCO<sub>2</sub> Equi.)

	1990	1995	2000	2002	2004	2005	'90-'05 AAGR (%)
<b>Total Emission</b>	297.5 (100.0)	451.8 (100.0)	527.5 (100.0)	568.0 (100.0)	587.3 (100.0)	591.1 (100.0)	4.7
<b>Energy</b>	247.7 (83.3)	372.1 (82.4)	438.5 (83.1)	473.0 (83.3)	489.0 (83.3)	498.6 (84.3)	4.8
<b>Industrial Process</b>	19.9 (6.7)	47.1 (10.4)	58.3 (11.1)	64.5 (11.4)	68.5 (11.7)	64.8 (11.0)	8.2
<b>Agriculture/ Livestock</b>	13.2 (4.4)	16.6 (3.7)	15.3 (2.9)	14.7 (2.6)	14.9 (2.5)	14.7 (2.5)	0.7
<b>LULUCF</b>	(-)23.7	(-)21.2	(-)37.2	(-)33.4	(-)31.5	(-)32.9	2.2
<b>Waste</b>	16.6 (5.6)	16.1 (3.6)	15.5 (2.9)	15.7 (2.8)	14.9 (2.5)	13.0 (2.2)	-1.6
<b>Net Emission</b>	273.7	430.6	490.3	534.5	555.8	558.3	4.9

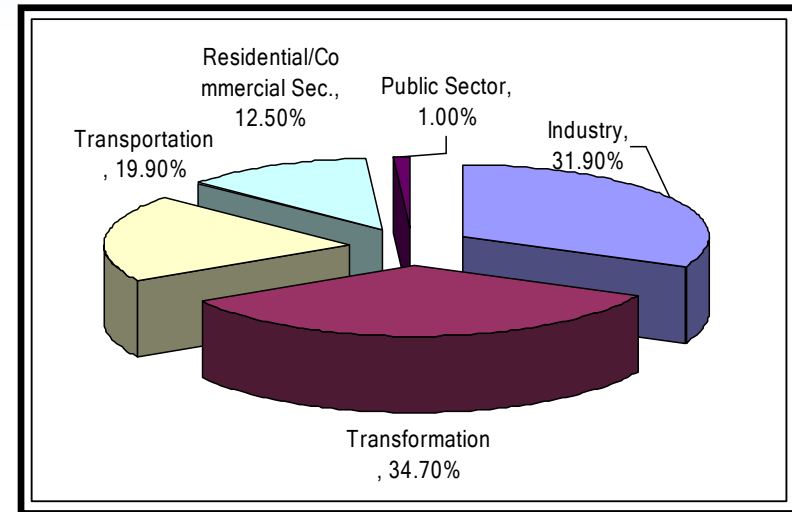
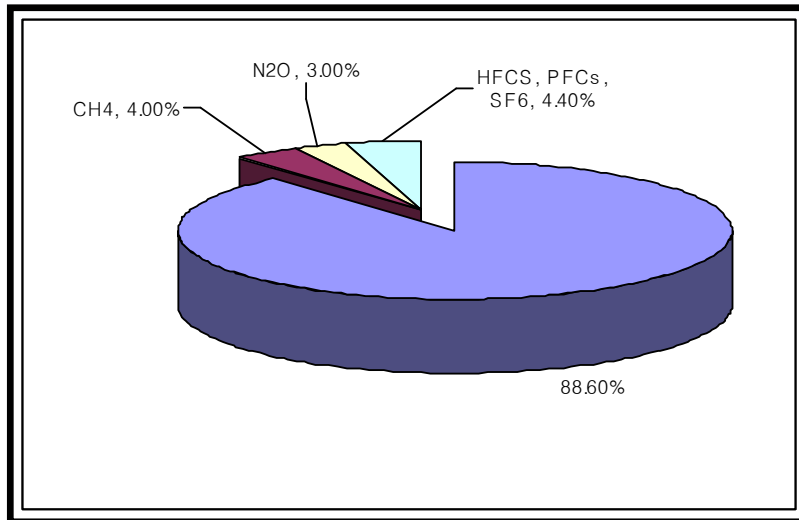


## Trends of GHGs Indicators

	1990	1995	2000	2004	2005	'90~'05 AAGR (%)
Total Emissions for GHG [MMTCO <sub>2</sub> eq.]	297.5	451.8	528.5	587.3	591.1	4.7
GDP (billion Won, 2000 Price)	320,696	467,099	578,665	693,996	723,127	5.6
Per capita Emissions [MT/ person]	6.94	10.02	11.24	12.21	12.24	3.9
GHG/GDP [tCO <sub>2</sub> eq. per a million won]	0.93	0.97	0.91	0.85	0.82	-0.8



## GHGs Emission in 2005



- CO2 is the Major Gas, whose share is 88.6%  
- CO2 from Energy related Activities : 83%
- HFCs, PFC, SF6 : 4.4%
- Major source of CO2 in energy use is the transformation sector (i.e. electricity, Heat production).
- Industrial Sector is about 31.9%



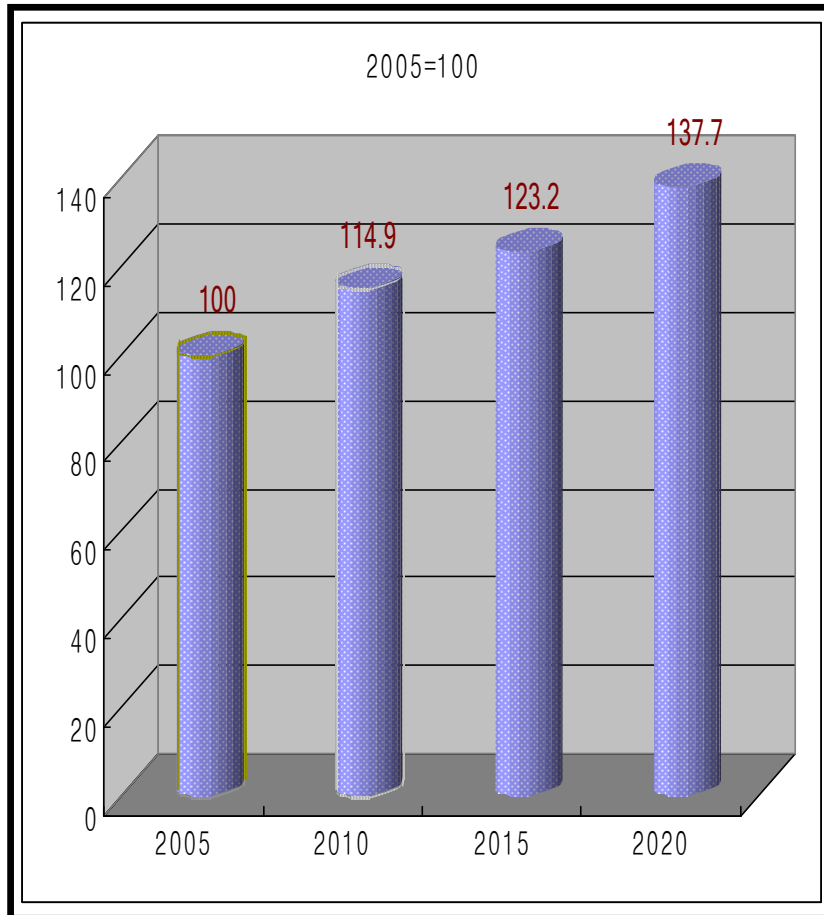
# GHGs Emissions From Energy Use by Sectors

MMTCO<sub>2</sub>

	1990	1995	2000	2002	2004	2005	'90-'05 AAGR (%)
Industry	87.6 (35.4)	133.5 (35.9)	153.1 (34.9)	160.1 (33.9)	158.1 (32.3)	156.15 (31.5)	3.9
Transport	42.4 (17.1)	77.2 (20.7)	87.1 (19.9)	94.9 (20.1)	96.6 (19.7)	97.6 (19.7)	5.7
Household /Commercial	67.2 (27.1)	70.4 (18.9)	64.0 (14.6)	62.1 (13.1)	60.1 (12.3)	61.13 (12.3)	-0.6
Public Sec.	7.0 (2.8)	4.7 (1.3)	4.0 (0.9)	4.3 (0.9)	4.7 (0.9)	4.92 (1.0)	-2.3
Transform	38.0 (15.3)	83.2 (22.4)	125.9 (28.7)	146.8 (31.0)	165.0 (33.7)	170.78 (34.4)	10.5
Fugitive	5.4 (2.2)	3.2 (0.9)	4.4 (1.0)	4.8 (1.0)	5.7 (1.2)	5.9 (1.2)	0.6
Total	247.7 (100)	372.1 (100)	438.5 (100)	473.0 (100)	490.2 (100)	496.48 (100)	4.7
Pri. Ener. Consump.	93 (100)	150 (161)	193 (207)	208 (224)	220 (236)	229 (246)	6.2



## GHGs Emission Projection



➤ Annual Growth of GHGs to 2020: 2.2%

➤ 814MMTCO<sub>2</sub> equi. in amount. (37.7% increase)

➤ Annual Growth of GHGs Emission to 2020 by Sector

➤ Energy : 2.1%

➤ Industrial Process : 2.2%

➤ Waste : 4.8%

➤ Agriculture/ : - 0.6%

➤ LULUCF : 0.4%



# GHGs Emission Projection From Energy Use by Sectors

Unit: MMTCO<sub>2</sub>

	2005	2010	2015	2020	'05-'20 AAGR (%)
Industry	157	163.9	170.5	184.8	1.1
Transport	98	118.8	132.7	146.7	2.7
Household /Commercial/Public	67	73.0	77.7	82.9	1.5
Transform	171	211.9	222.9	261.8	2.9
Total	492.7	567.6	603.9	676.1	2.1





## KOREA under UNFCCC, Kyoto Protocol

- ✦ **As a Non-ANNEX I Country**
  - Ratified Kyoto Protocol in 2002.10
  - To Participate voluntarily in Lowering GHGs Emission Increase and to Submit 3<sup>rd</sup> National Communication in 2008
- ✦ **Establishment of Climate Change Committee (April, 1998)**
  - Ministerial Level Committee Chaired by Prime Minister
  - To Make and Monitor National Action Plan for UNFCCC
- ✦ **Establishment of Special Committee for Climate Change in National Assembly (March, 2001)**
- ✦ **Task Force of Energy Intensive Industries to Lower GHGs Emission (November, 2004)**



## National Action Plans for UNFCCC

### ➤ 1<sup>st</sup> National Action Plan for UNFCCC (1999~2001)

- Establish Foundations in Climate Change Policies, R&D in Mitigation Technology, Assessment of Kyoto Mechanism

### ➤ 2<sup>nd</sup> National Action Plan for UNFCCC (2002~2004)

- Preparedness for the UNFCCC Negotiation, Improvement of Efficacy of GHGs Mitigation Policies, Strengthening Bases for Kyoto Mechanism and National Registry

### ➤ 3<sup>rd</sup> National Action Plan for UNFCCC (2005~2007)

- To Play a Role of a Contributing Party of International Efforts in Mitigation of GHGs Emission

### ➤ 4<sup>th</sup> National Action Plan for UNFCCC (2008~2012)

- To Extend Plan Period from 3 yrs to 5 yrs and to Minimize the Impact of Climate Change through Mitigation and Adaptation



## 4<sup>Th</sup> National Action Plans for Climate Change

### Mitigation

- Restructuring Energy Supply and Demand
- Increase Role of Nuclear Energy
- Removal of GHGs by Sink
- Revitalize Carbon Market

### Adaptation

- Strengthen Capacity
  - Increase the role of local government
  - Nationwide Campaign for Awareness
- Making and Execution of Sectoral Adaptation Plan

### R & D

- Promote R & D in Core Mitigation Technology
- Develop and Secure Basic, Original Technology
- Strategic Investment on R & D

### Infra Structure

- Promoting public-private Partnership for climate action
- Legislate Climate Change Law
- Secure the Fund for Climate Change Action
- Improving National Inventory System

### Int'l Cooperation

- Active Participation in Int'l Climate Change Negotiation
- International Cooperation and Supporting Developing Countries in Capacity Building and Adaptation



## Foundations of Climate Change Mitigation

- ✦ **National Inventory System Established in 2006**
  - More Efforts to Complete Inventory System at the Firm and Plant Level
  - To Survey and Analyze GHGs Emission from the Energy Consumption
  - 1<sup>st</sup> Phase Energy Technology D/B Established in 2007
  
- ✦ **National Registry Established**
  - Voluntary Reduction of GHGs Emission by Firms Registered
  - To Provide Incentives for Early Action
  - 41 Projects enlisted, GHGs reduction: 1MMTCO<sub>2</sub>/yr



## Transition to Low Carbon Economy

### Increasing Share of Renewable Energy

- **2.3% of Total Primary Energy in 2006**
  - To 5% in 2011 and 9% in 2030
  - **3 High Priority Areas : Photovoltaics, Wind Power and Hydrogen/Fuel Cell**
  - **Feed-in Tariff : Tariffs for photovoltaic, wind, small scale hydro and landfill gas electricity generation are 716.40, 107.60, 73.70, 61.80 KRW/kWh, respectively.**
- **Mandatory Installation of Renewable Energy Equipments in Public Sector Buildings**
- **Bio-Diesel Mix in Automotive Fuel: 0.5% in 2007 to 3.0% in 2012**
  - Tax exemption for the Bio-Diesel
- **Increase Share of Natural Gas reducing 5.48MMTCO2 by 2012**



# Transition to Low Carbon Economy

## Voluntary Agreement in Industry

- Firm/Plant (> 2 TMT0E/yr) : Voluntarily Preparing Efficiency Improvement Plan and Committing itself to Achieve Target
- Government: Providing Fund at Preferential Interest Rate and Tax Credit
- Voluntary Agreements made : 1,353 Plants (1.64MMTCO<sub>2</sub>/yr) as of Dec. 2006
  - 1,353 facilities in 2006 to 14,375 facilities in 2012 (1.8MMTCO<sub>2</sub>)
- Introduction of Negotiated Agreement : Involvement of Government in Planning and Setting Target Stage in 2010
- Audit and Management Energy Use : Energy Intensive Plants, Mid- and Small- Size Firms
- Auditing : 121 firms in 2006 to 2,502 in 2012
- Financial Incentives to ESCO Firms and Projects
- Tax and Financial Incentives for Investment on Energy Conservation Projects



## Transition to Low Carbon Economy

➤ **Zero Increase in Energy Use in Public Sector by 2010**

➤ **Large and Small Scale Combined Heat and Power Supply System**

➤ Supply CHPs in Residential Area and Industrial Complex achieving 2.5MMTCO<sub>2</sub>/yr by 2012.

➤ **Industrial Sector**

➤ GHGs Emission Mitigation in Industrial Process: Development of GHGs Emission Reduction Methods in Semi-Conduct Industry and HFC.



## Efficiency Improvements

### **Households, Public Sector, Buildings**

- **Labeling and Minimum Efficiency Standards for Home Electronics (17 items in 2006 to 22 items in 2012)**
  - **1W Stand-by Program: Labeling on Office Equipment and Home Electronics Meeting 1W Power Stand-by Standard**
- **Mandatory Use and Preferential Purchase of Efficient Electronics and Office Equipments by Public Sector**
- **Implementing Energy Saving Features in Designing Building**
- **Setting Higher Standards for Insulation**
- **Energy Efficiency Rating Labeling for the Buildings**





# Efficiency Improvements

## Transportation

- **Expect High Growth Rate in Energy Consumption**
  - : 20% of GHGs Emission in Energy Use, 1.9% AGR expected
- **Incentives for Sub-Compact, CNG, LNG Cars**
- **Promote the Deployment of Hybrid Car**
  - **Subsidy for the Price Differences, Public Sector Mandatory Purchase**
  - **Hybrid: 321 Units in 2005 to 7,920 Units in 2012**
  - **Fuel Cell: 1,750 in 2012**
- **Average Fuel Efficiency Standard for the Automobile maker**
- **To Extend BUS RAPID TRANSIT LANE to Promote Public Transportation and To Introduce Electric Toll System**
- **Promotion of Deployment of Natural Gas Bus by Local Governments**



## Adaptation

### To Improve the Forecast of Long Term Climate Change In Korea

- To Improve the Quality of the Forecast of Climate Change to Assess the Impact and to Prepare the Adaptation Strategies.
- Provide Research Fund For Downscaling in GCM Modeling for the Accuracy and the

### ➤ To Prepare the Priority and Strategies in Adaption

- To Assess the Impact of Climate Change by Sector, by Geographical Area, by Industry
- Determine the Priority based upon the Cost and Benefit of Adaptation Measures

### ➤ Still in the Stage of Research and Exploration



## Public Awareness

### Active Involvement of NGOs

- Climate Week: Involvement of Industrials, NGOs and Central and Local Governments
  - Best Practices, Improve Efficiency of The Policies
- Promotion of High Efficiency Equipment in Households
  - Implemented as a Program CDM project

### Role of Local Government

- Establishment of Local GHGs Inventory System
- Development and Implementation of Localized Policy and Measures to Mitigate GHGs Emission

### Education for Better Knowledge and Expertise

- Textbooks, Grants to Graduate School



# Carbon Market Development

## CDM Projects

- Bi-lateral and Uni-lateral CDM Projects
- 12 Projects, CERs (10% of Global CERs, 2007.4)
- Active Identification of CDM Projects

## Launching 1<sup>st</sup> Carbon Fund

- Investment on CDM Projects, CERs and AAUs
- Initial Size : 110MUS\$

➤ Restructuring existing tax system toward Environment tax system

➤ Voluntary Emission Trading within a Firm



## R&D of GHGs Mitigation Technology

### **Energy Efficiency and Renewable Energy Technology**

- **Asia-Pacific Partnership : Cooperation in Development and Deployment of Clean Technology**
- **Hybrid, Fuel Cell Vehicle Technology R&D : 50% Fuel Efficiency Improvement, 40% CO2 Emission Reduction**
- **Differentiated Approach for the R&D in Renewables: Short-term Commercialization and Mid-Long Term Approach**

### **CCS Technology**

- **Application of Technology for Power Plant and Iron and Steel Plant**
- **International Cooperation in R&D**



**Thank You for Your Attention!**

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