

The 5th AIM International Workshop

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Activities in the Fiscal Year 1999 in Korea

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Contents

- AIM/Korea Emission Model
- New Studies in FY 1999
- Further Studies

Fields in Residential Sector

○Cooling

⊗ Air-Con(2), Fan

○Main Heating & Hot Water

⊗ Boiler(6), Insulation, Solar Energy

○Auxiliary Heating

⊗ Heater(4), Electric Pad

○Cooking

⊗ Oven Range(2)

Fields in Residential Sector

○Lighting

✿ Lamp(5)

○Electric Appliances

✿ Television(2), Refrigerator(2),
Washing Machine(2), Personal Computer(2)

Fields in Commercial Sector

○Cooling

- ✿ Co-Gen.(2), Air-Con(3), Cooling & Heating(4)

○Main Heating & Hot Water

- ✿ Co-Gen.(2), Boiler(7), Cooling & Heating(4)

○Auxiliary Heating

- ✿ Heater(6)

○Cooking

- ✿ Oven Range(7)

○Lighting

- ✿ Lamp(4)

Fields in Transportation Sector

○ Passenger Transport

- ✿ Passenger Cars(15)
- ✿ Jeeps(2)
- ✿ Taxis(8)
- ✿ Buses(5)
- ✿ Rail Ways
- ✿ Coastal Water Passenger
- ✿ Air Transports

○ Freight Transport

- ✿ Trucks(12)
- ✿ Rail Ways
- ✿ Coastal Water Freights
- ✿ Air Transports

Fields in Steel Industry

- Coke Oven
- Coke Quenching Equipment
- Sintering Machine
- Blast Furnace
- Steel Making Process
- Hot & Cold Rolling
- Annealing
- Steam
- Electricity

Fields in Cement Industry

- Portland Clinkering
- Portland Clinkering Coking Process
- Portland Cement Finishing Process
- Slag Crushing Process
- Electricity

Fields in Petrochemical Industry

- Ethylene Production
- Low Density Polyethylene(LDP)
- High Density Polyethylene(HDP)
- Polypropylene Production
- Steam Generating Process
- Electricity

Brief Economic Outlook

○ Macro Economic Conditions

- ⊗ **Financial Crisis (Dec. 1997: -5.9% GDP Growth)**
- ⊗ **Quick Recovery (1999: over 6% GDP Growth)**

○ Major Economic Reforming

- ⊗ **Industrial Structural Changes:**
(IT industries are booming.)
- ⊗ **Reforming Financial Sector:**
(Merging Bank/Financial Industries)
- ⊗ **Moving from Big Conglomerate to Medium/Small Size Enterprises**

Brief Economic Outlook

○ Revising Economic Forecasts

- ⊗ **GDP Growth rate is coming back to normal trend.**
- ⊗ **Less Energy Intensive Industries in Manufacturing Sector**
- ⊗ **More Service Industries**

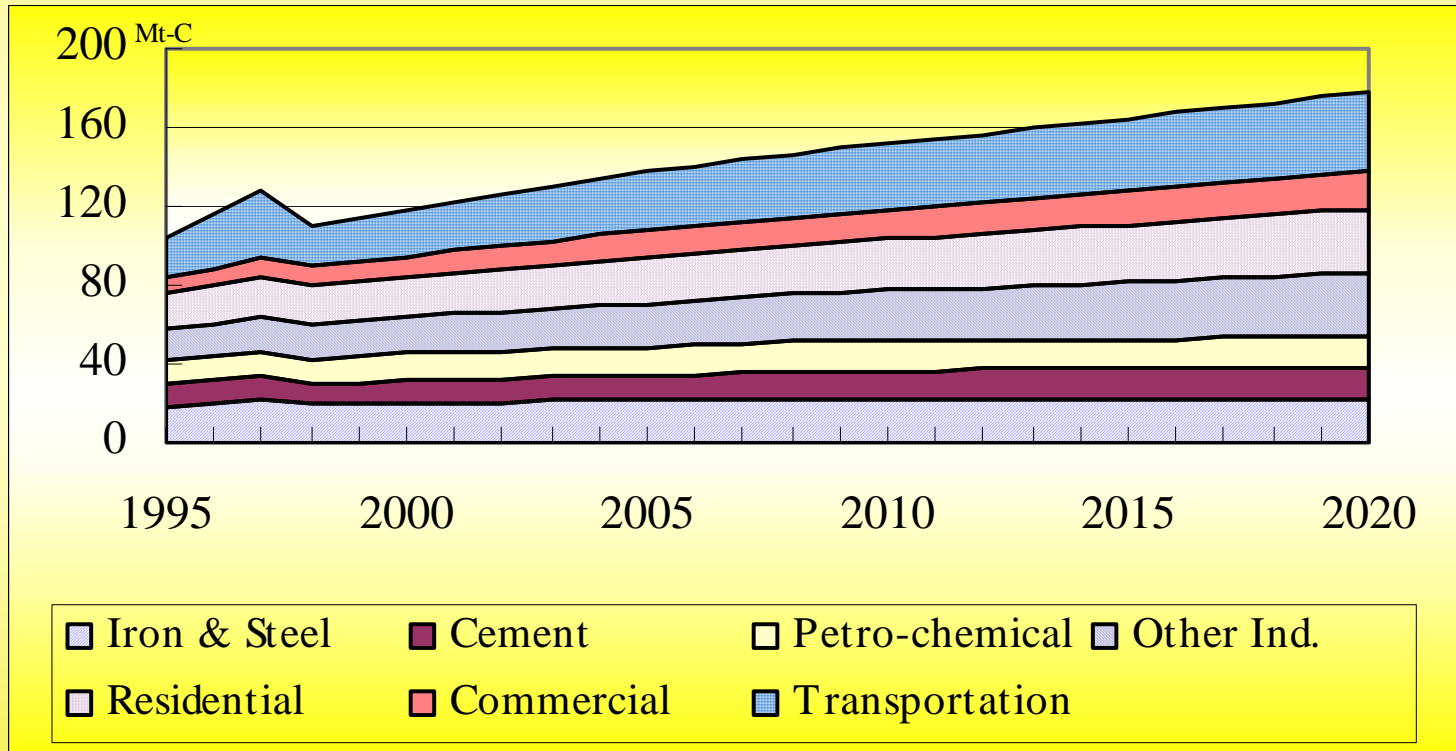
Scenarios (1995 -2020)

- **BaU: Business-as-Usual**
- **FIX: No Technological Changes**
- **TAX: Carbon Tax (30,000 Won/TC, from 2000)**
- **SUBSIDY: TAX + Subsidy (from 2001)**

(Exchange Rate: 1\$ = 1,200Won)

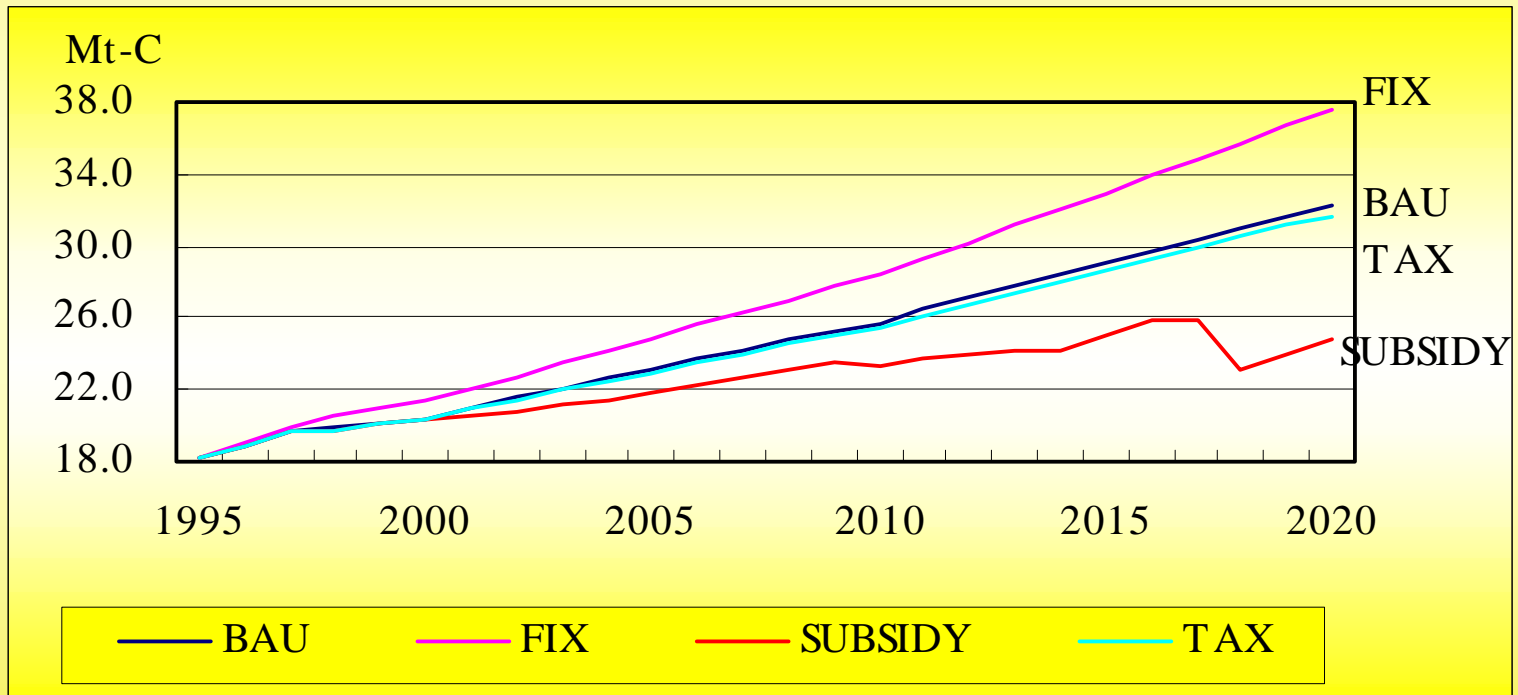
Total CO2 Emission in Korea

- BaU Scenario -



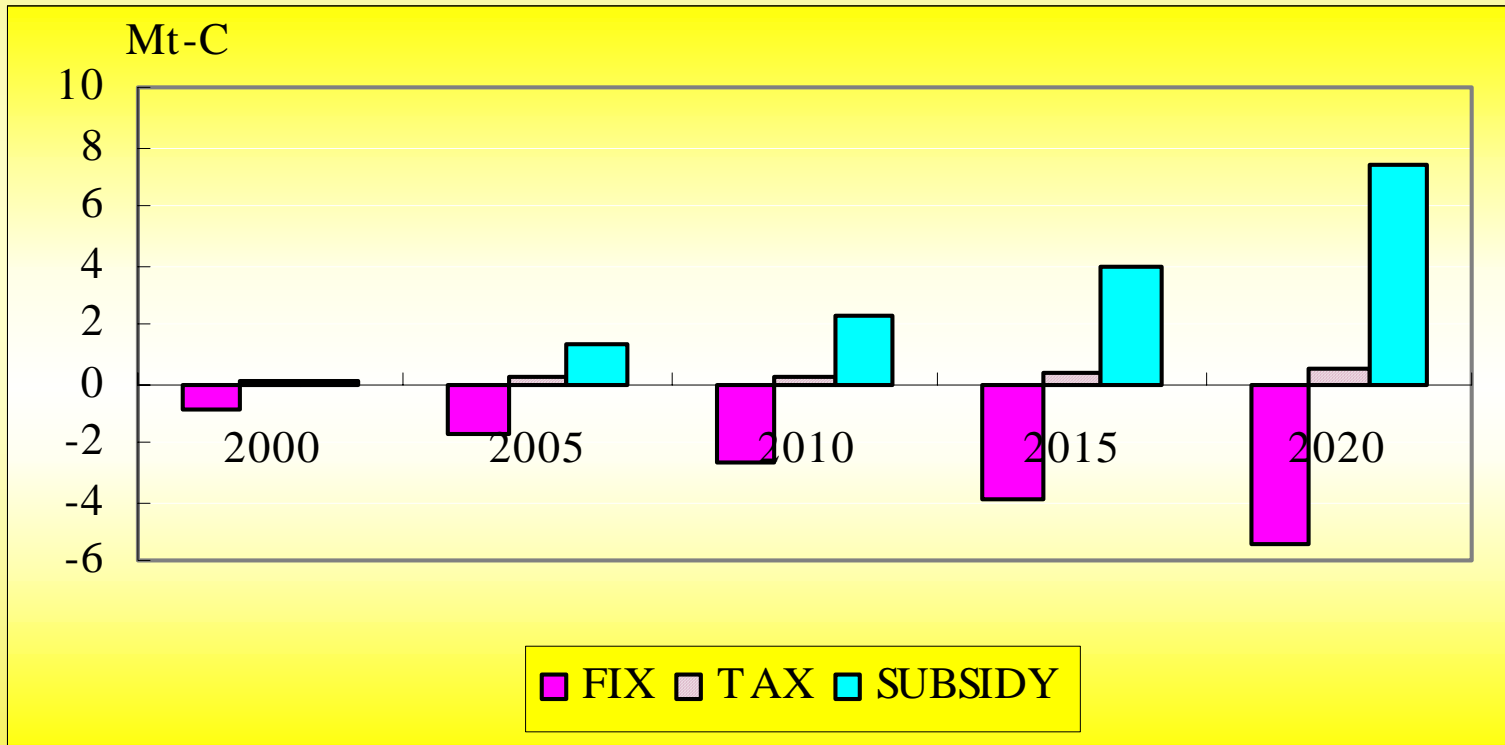
Residential Sector

- CO2 Emission Projection -



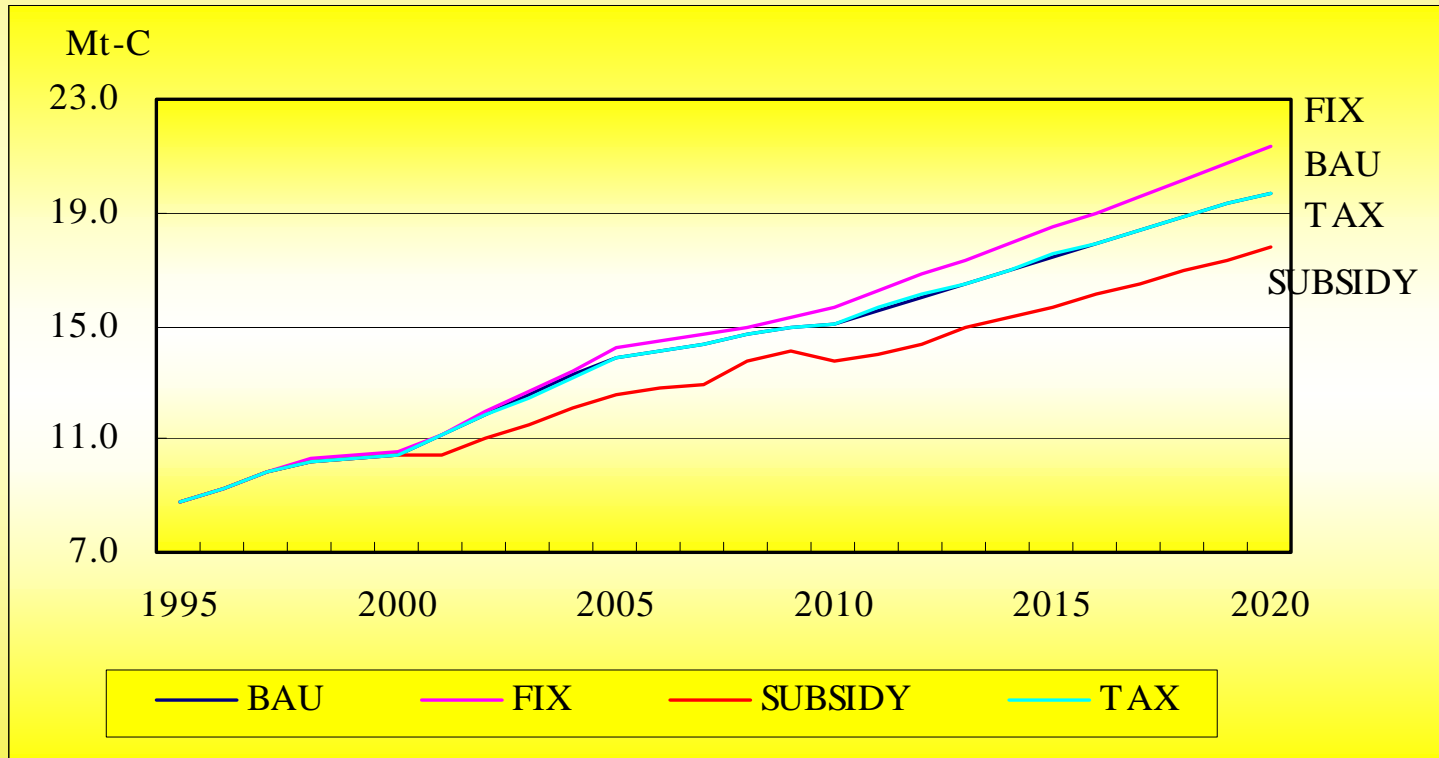
Residential Sector

- CO2 Emission Reduction by Scenarios -



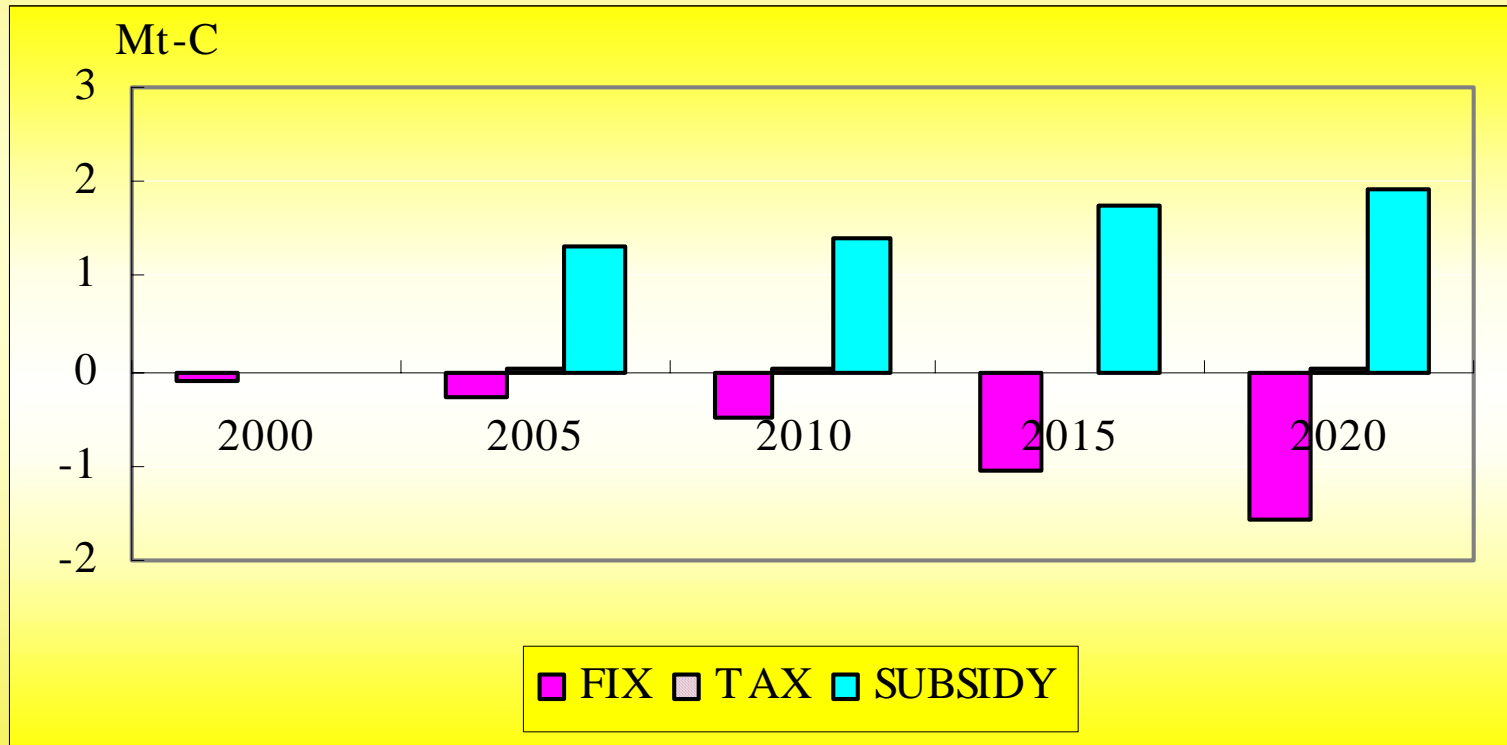
Commercial Sector

- CO2 Emission Projection -



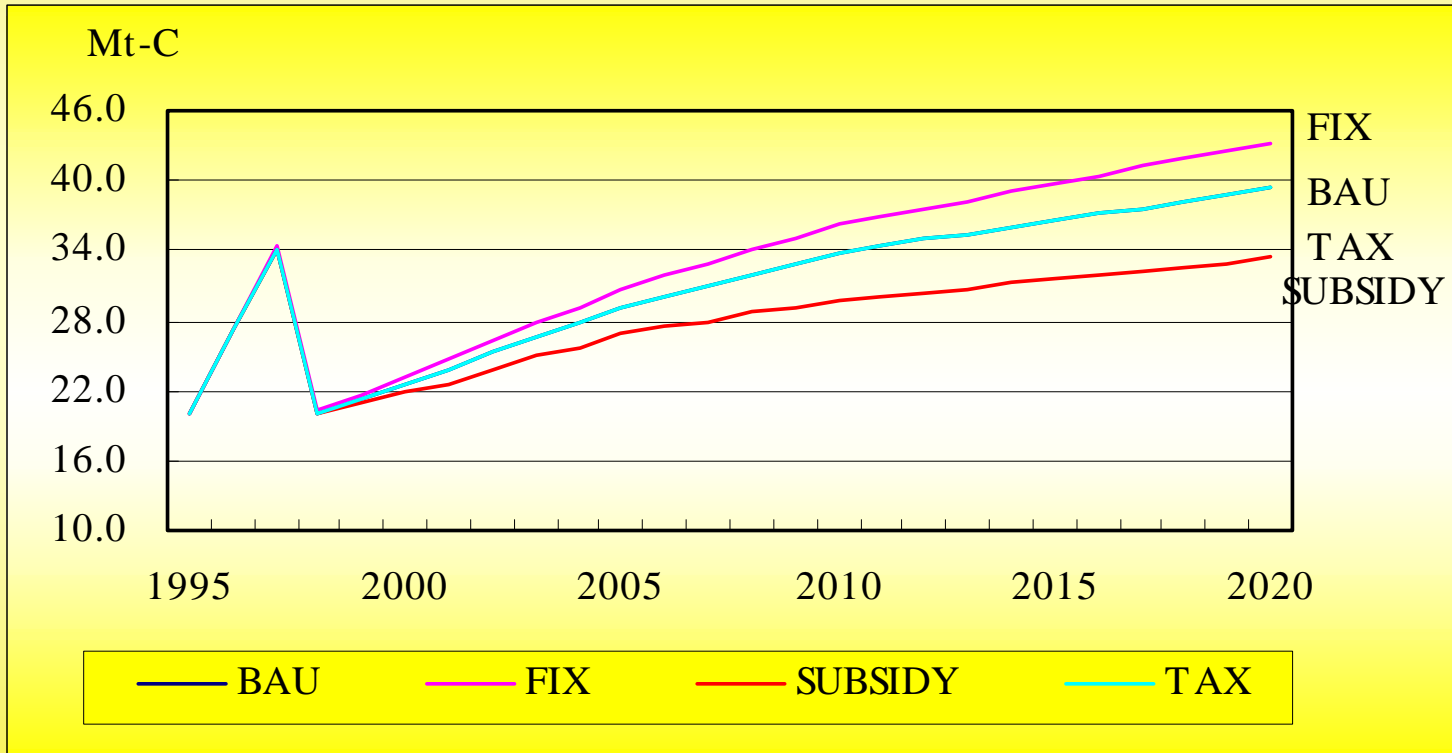
Commercial Sector

- CO2 Emission Reduction by Scenarios -



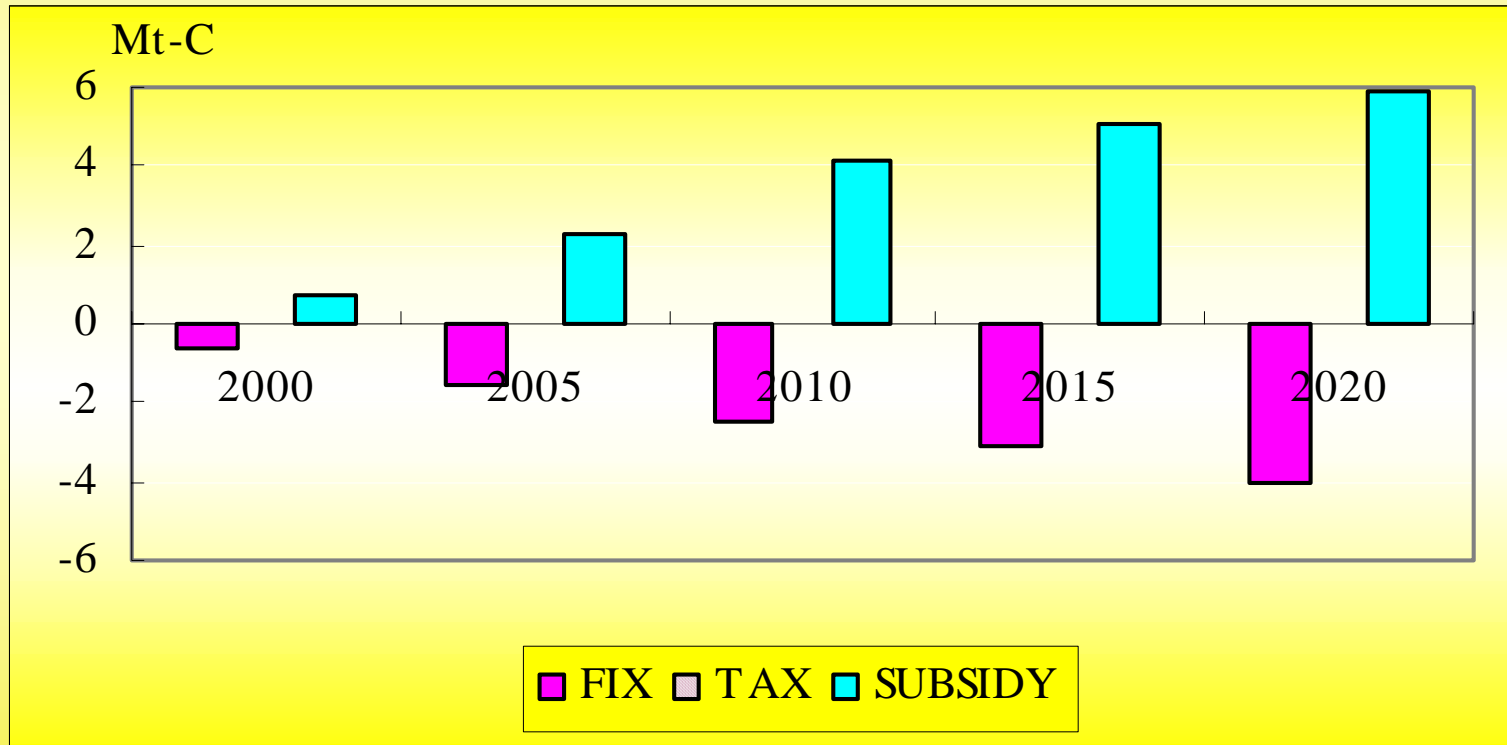
Transportation Sector

- CO2 Emission Projection -



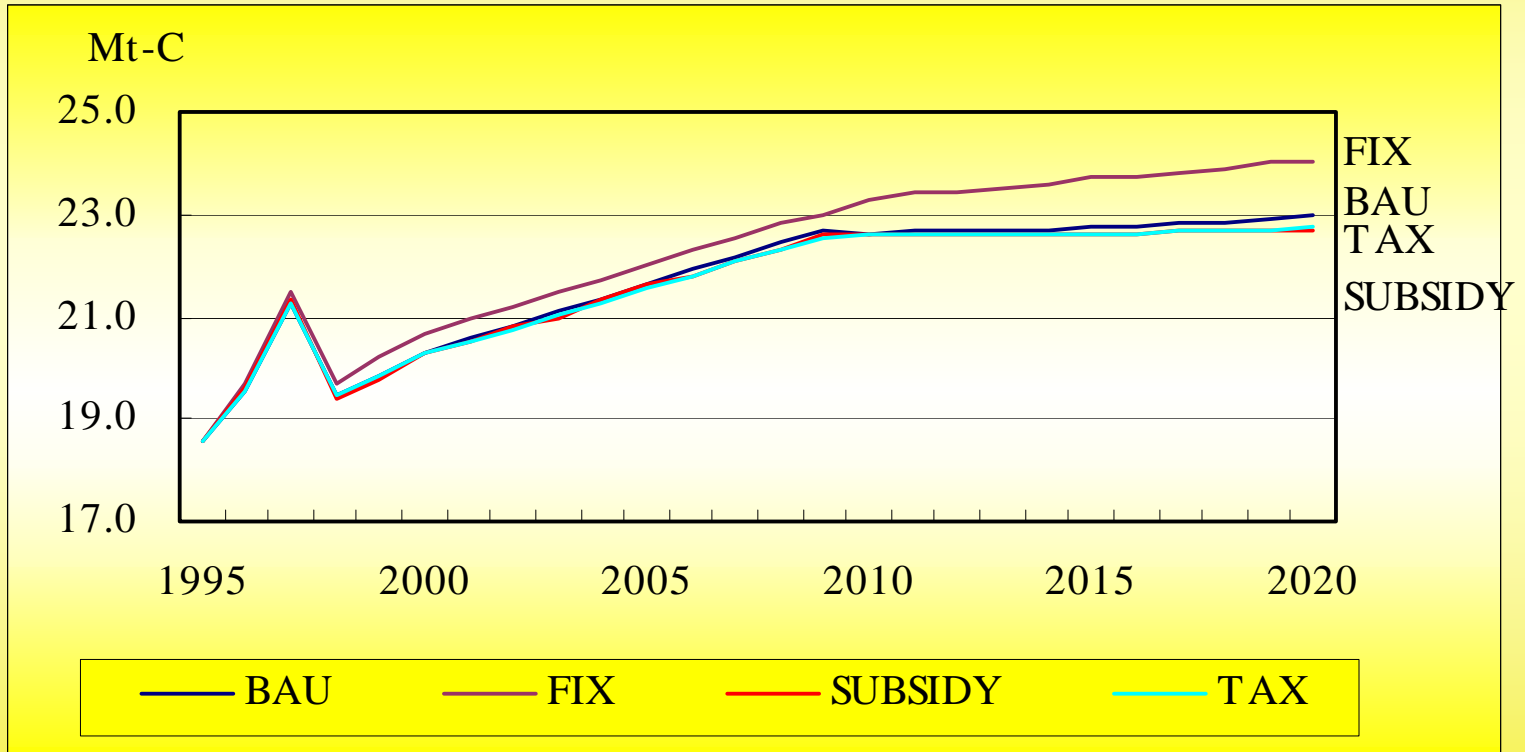
Transportation Sector

- CO2 Emission Reduction by Scenarios -



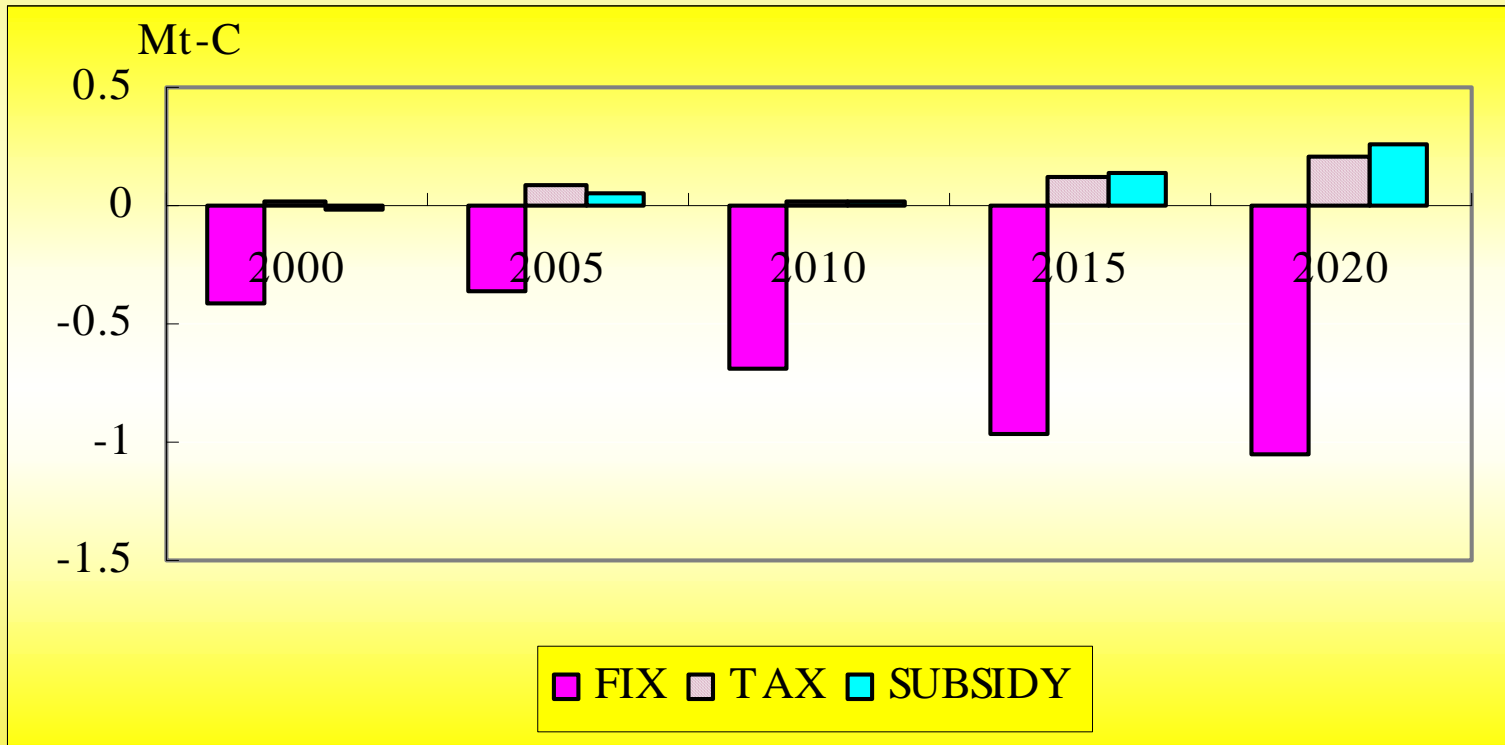
Steel Industry

- CO2 Emission Projection -



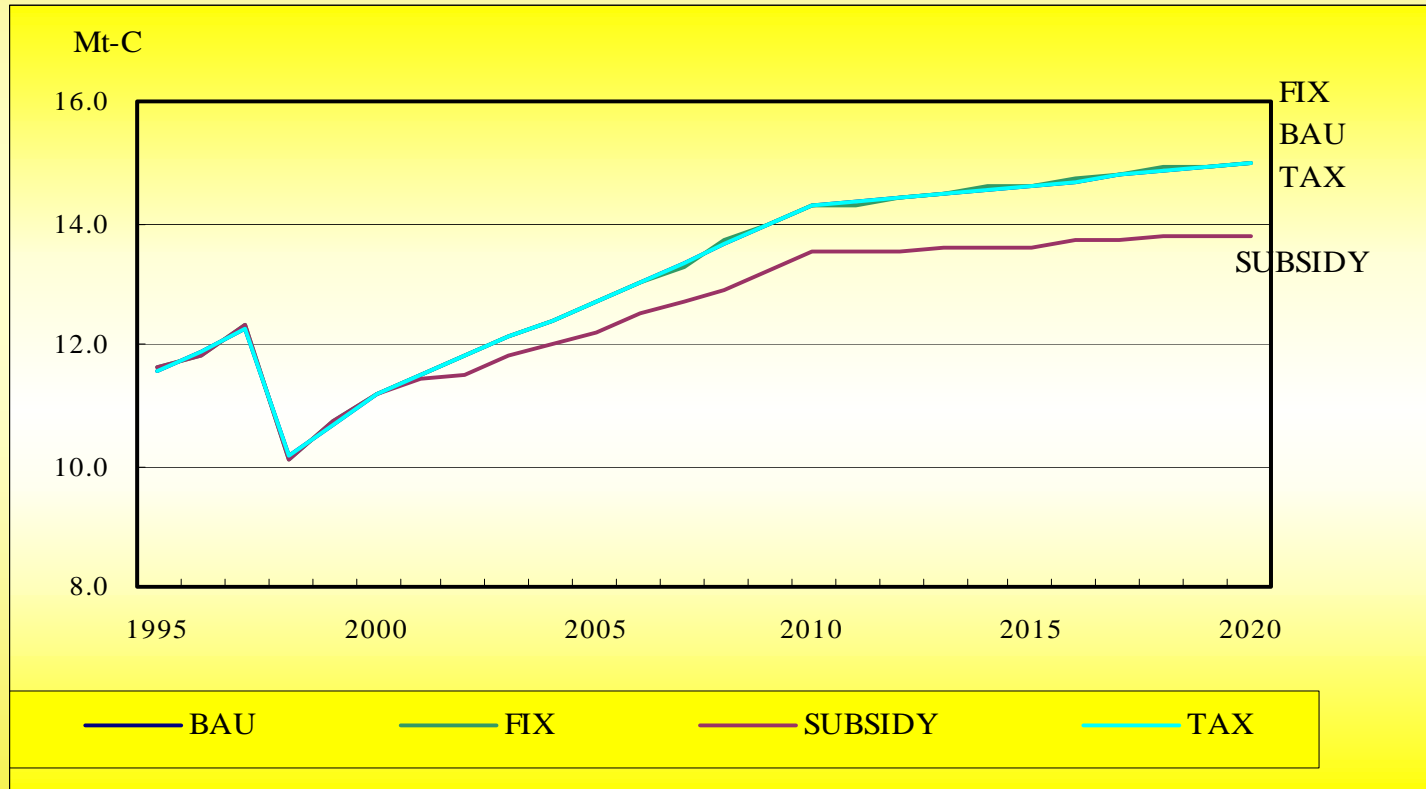
Steel Industry

- CO2 Emission Reduction by Scenarios -



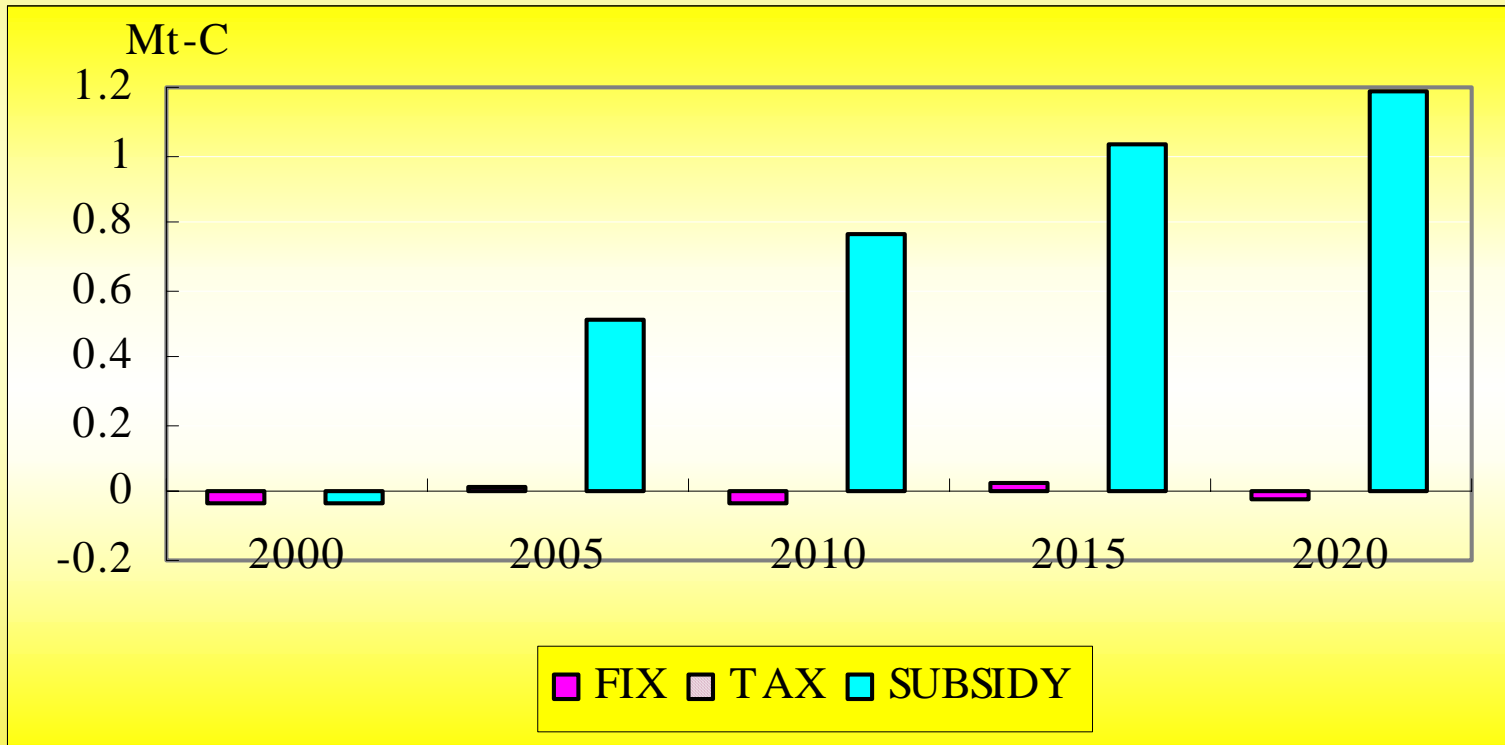
Cement Industry

- CO2 Emission Projection -



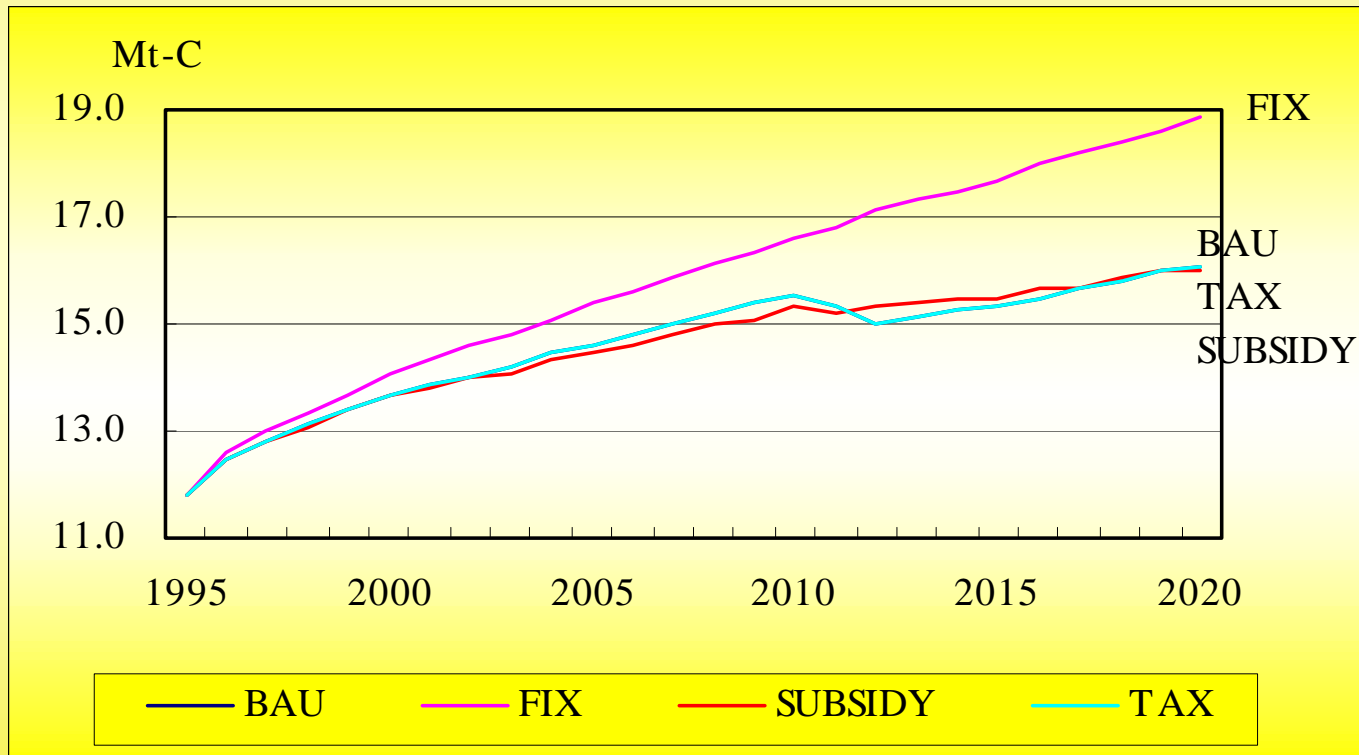
Cement Industry

- CO2 Emission Reduction by Scenarios -



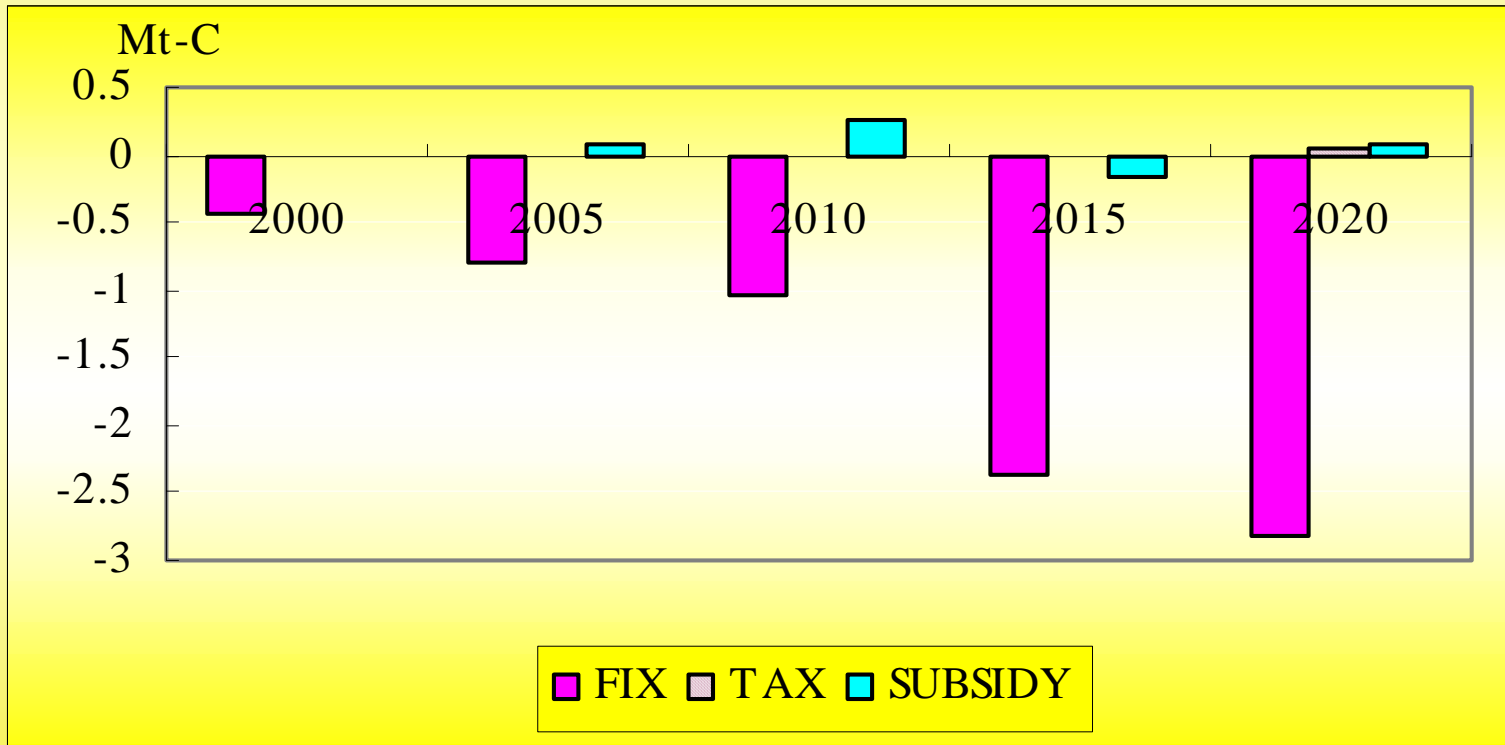
Petrochemical Industry

- CO2 Emission Projection -



Petrochemical Industry

- CO2 Emission Reduction by Scenarios -



New Studies in FY 1999

○ Residential Sector

- ✿ **Application of Mini-AIM**

○ Transportation Sector

- ✿ **Further Simulation**

○ Industrial Sector

- ✿ **BaU Projection for Other Industries**

○ Transformation Sector (Power Gen., Town Gas)

- ✿ **This sector is integrated in each final end-use sector.**
- ✿ **Now, all sectors in AIM/Korea Model can be run simultaneously.**

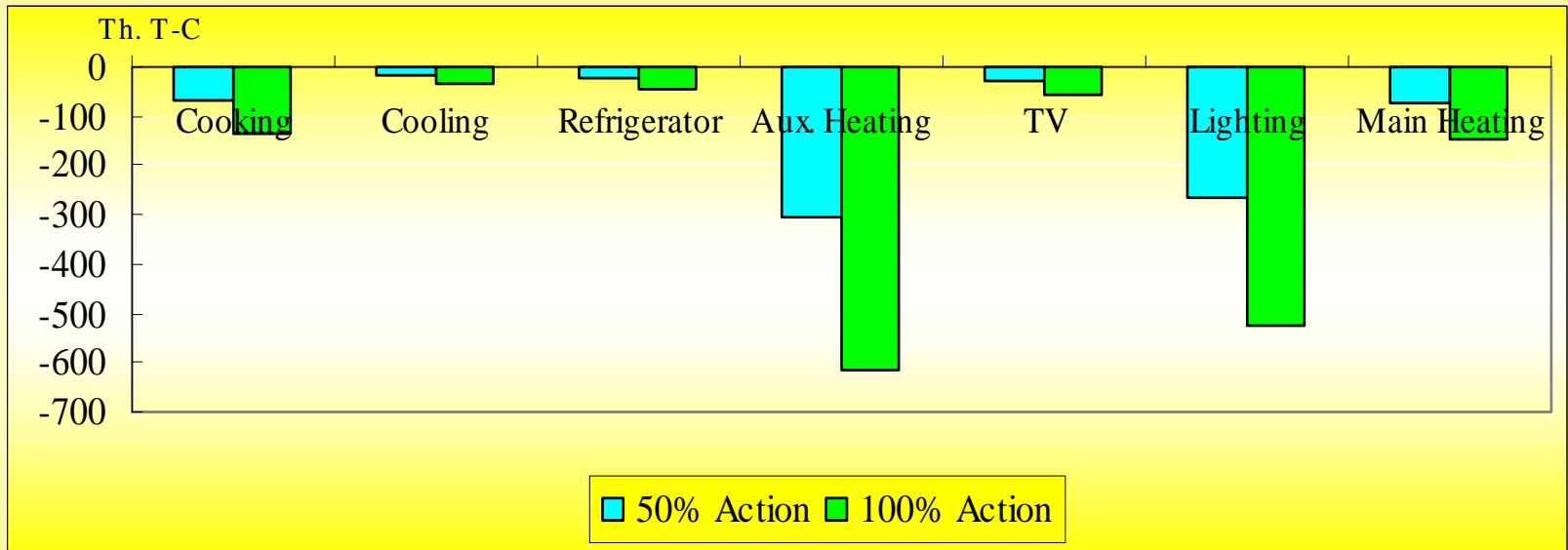
Residential Sector (New Studies)

○ Application of Mini-AIM

- ✿ **Cooking:** To control flame of oven range,...
- ✿ **Cooling:** To set up higher cooling temperature,...
- ✿ **Lighting:** To use efficient lamp,...
- ✿ **Cooling:** To set up higher cooling temperature,...
- ✿ **Main Heating:** To set up lower heating temperature,...
- ✿ **Aux. Heating:** Insulation
- ✿ **TV:** To plug off when not watching it
- ✿ **Refrigerator:** To reduce the frequency of open and close it

Residential Sector (New Studies)

- CO2 Emission Reduction by Mini-AIM -



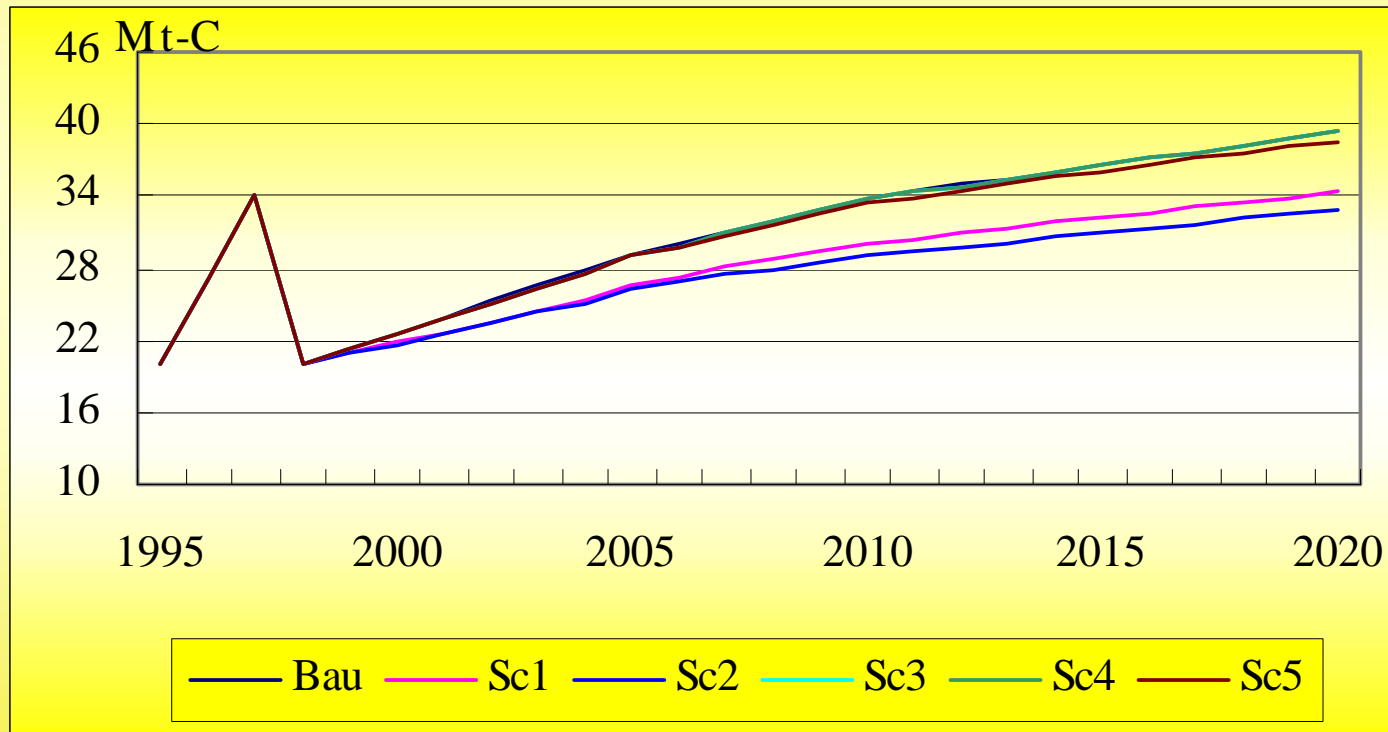
Transportation Sector (New Studies)

- Further Simulation -

- **BaU: Business-as-Usual**
- **Sc 1: Extension of Payback Period (5 Years)**
- **Sc 2: Extension of Payback Period (8 Years)**
- **Sc 3: TAX: Carbon Tax (300,000 Won/TC, from 2000)**
- **Sc 4: Subsidy on Only CNG Bus (+ 15 persons)**
(15,000 thousand Won)
- **Sc 5: Subsidy on Only CNG Bus (+ 15 persons)**
(20,000 thousand Won)

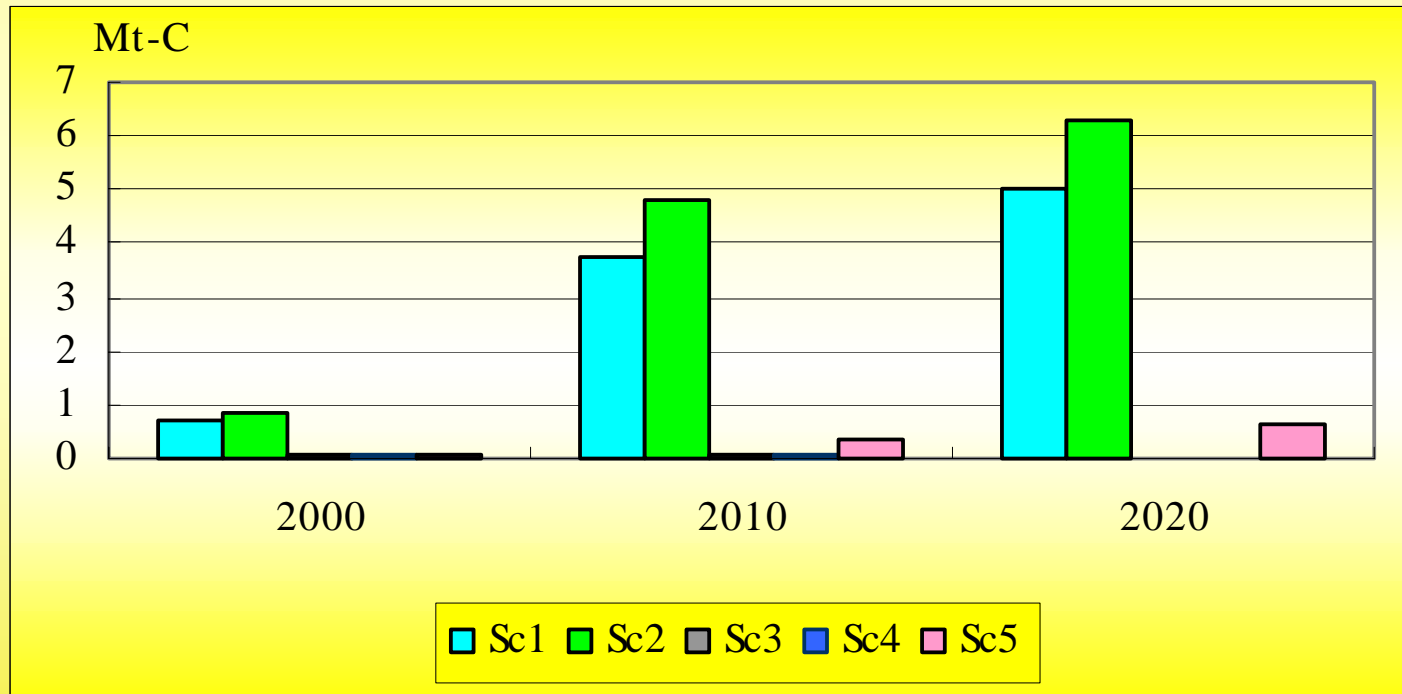
Transportation Sector (New Studies)

- Further Simulation -



Transportation Sector (New Studies)

- CO2 Emission Reduction by Scenarios -



Major Findings

○ **CO₂ Emissions will continue to increase.**

✿ **Transportation Sector: Fastest Growing**

○ **New technologies are still expensive.**

✿ **Marginal Cost Evaluation: Critical Factor**

○ **Appropriate policy measures are necessary.**

✿ **Carbon Tax, Subsidy, Energy Efficiency Improvement Programs, Fuel Substitution...**

Major Findings

○ Application of Mini-AIM is useful for climate policy formation.

✿ Assessment of Specific Action Plans

○ Choice of Policy in Transportation Sector

✿ Subsidy (30,000 Won/TC for all transport modes)

vs.

Subsidy (20,000 thousand Won for CNG bus)

Further Studies

○ To Identify the Target Sectors

- ⊗ To Minimize the Economic Impact

○ To Develop More Sector-specific Scenarios

- ⊗ Fuel Substitutions
- ⊗ Market Interventions
- ⊗ Energy Efficiency Improvement Programs
- ⊗ International Cooperation

Further Studies

○ Application of Mini-AIM to Other Sectors

- ✿ To Develop Action Programs

○ Scenario Analysis for Other Industries

○ Assessment for Integrated Policies

- ✿ Global and Local Environment Policies
- ✿ Environment and Economic Policies

○ Updating Technology Database