

PG4) Sectoral Trends in Yeosu's Greenhouse Gas Emissions 2000-2007

Seong-Gyu Seo · Jun-Min Jeon¹⁾ · Zhong-Kun Ma · Yoon-Seob Seo²⁾
Hyun-Woo Jeong · Jong-Cheol Chae³⁾

Department of Civil & Environmental Engineering, Chonnam National University,

¹⁾Department of Civil & Environmental Engineering, Suncheon First College,

²⁾Green Jeonnam Environmental Complex Center,

³⁾Climate Protection Division, Welfare and Environment Bureau, Yeosu City

1. Introduction

According to the International Energy Agency (IEA), Korea was the 16th largest greenhouse gas (GHG) emitter in the world as of 2005, with 538 million tons of CO₂. As the host country of the G20 Summit in November this year, Korea wants to play an active role to cutting the greenhouse gas by the way of reducing global dependence on fossil fuels. Therefore, the Korean government planed to cut GHG emissions level 30% by 2020 from BAU (4% reduction from 2005 level) at the end of last year, that was the highest reduction level published by the developing countries. As we know that the largest source of CO₂ emissions is the combustion of fuels such as petroleum, coal and natural gas. Yeosu Industrial Complex is one of the largest chemical complexes in South Korea. There are about 180 chemical or petrochemical companies and large numbers of GHG was generated from there. The objectives of this study were to investigate the sectoral trends in Yeosu's GHG (CO₂, CH₄, N₂O, HFCs, SF₆) emissions from 2000 to 2007.

2. Materials and Methods

In this study, we used the methodology from "2006 IPCC Guidelines for National Greenhouse Gas Inventories" and "Korea Environment Corporation(Environmental Management Corporation)" to ensure an accurate GHG emissions inventory. The emission sector divides into 2 parts including the direct emission(Scope 1) and the indirect emission(Scope 2). The Scope 1 consists of 4 sectors such as 1) energy, 2) industrial processes, 3) agriculture, forestry, and other land use, and 4) waste. The activity data were obtained from Yeosu Annual Report, PEDSIS of Korea National Oil Corporation and other ways. Especially, the Yeosu City also supplied some more detailed information in order to ensure the accuracy of our activity data.

3. Results and Discussion

In 2000, total Yeosu GHG emissions were 20,022 thousand tons of CO₂eq while 23,630 thousand tons of CO₂eq in 2007, total GHG emissions have risen by 18.3% during this 7 years. The primary GHG emitted in Yeosu was CO₂, over 90% of total GHG emissions and the primary emission source was fuel combustion from energy sector. CH₄ and N₂O were produced by variety of anthropogenic activities include industrial processes sector and agriculture, forestry, and other land use sector, but the emission quantities are much lower than CO₂ emissions (Fig. 1 and Fig. 2). The energy sector and industrial processes sector are the two largest sources of GHG emissions, accounting for about 90.0%~93.6% of total GHG emissions from all emissions sectors. Over the 7 year period of 2000 to 2007, total emissions in the energy, industrial processes, waste (direct emission) and indirect emission sectors grew by 767 thousand tons of CO₂eq, 2,013 thousand tons of CO₂eq, 15 thousand

tons of CO₂eq, 1,013 thousand tons of CO₂eq, respectively. Emissions decreased in the agriculture, forestry, and other land use sector by 139 thousand tons of CO₂eq, accounting for approximately 50% of total GHG emissions in this sector (Fig. 3). The proportion of GHG emissions by fuel from energy sector was in the order of petroleum > coal > natural gas and the GHG emission trends from petroleum was decreased while the coal was increased (Fig. 4).

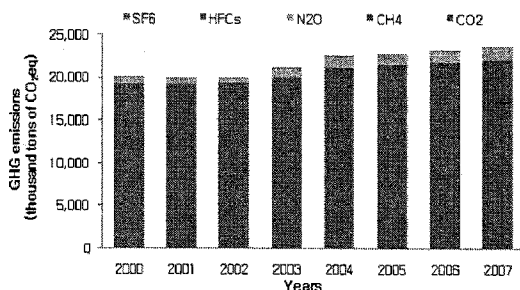


Fig. 1. Yeosu GHG Emissions by Gas.

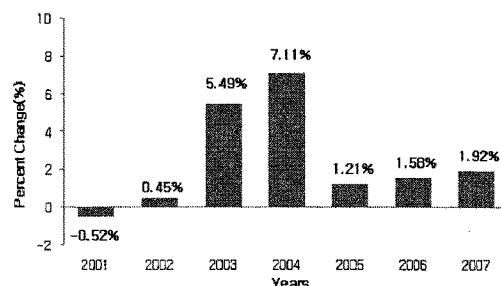


Fig. 2. Annual Percent Change Compared with the Previous Year in Yeosu GHG Emissions.

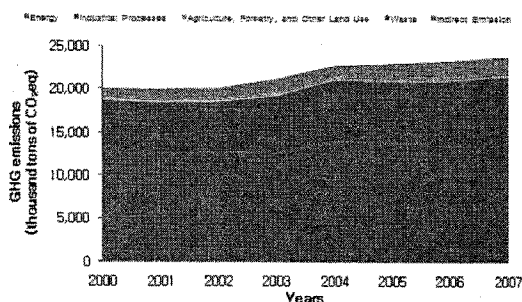


Fig. 3. Yeosu GHG Emissions by Sector.

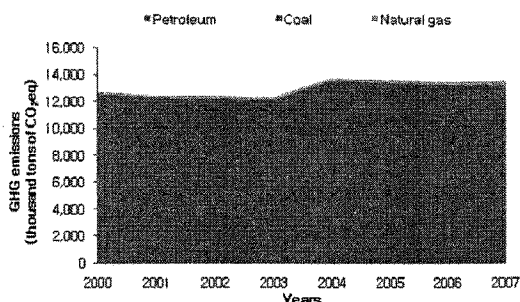


Fig. 4. Yeosu GHG Emissions by Fuel (Energy Sector).

Acknowledgements

The financial support from Yeosu City (2009, Korea) and Jeonnam Regional Environmental Technology Development Center (JETeC, 2008, Korea) is gratefully acknowledged.

References

- Intergovernmental Panel on Climate Change (2006) 2006 IPCC Guidelines for National Greenhouse Gas Inventories, IPCC.
- Presidential Commission on Green Growth Republic of Korea (2009) Road to Our Future: Green Growth, National Strategy and the Five-Year Plan.