

PG18) Inventory of Greenhouse Gas Emissions at Gwangyang Bay Area in 2005

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1. Introduction

Korea's greenhouse gas (GHG) emissions were about 590MT CO_{2eq} in 2005 and had more than doubled in the last fifteen years (1990~2005). Recently, the government have set out three mitigation scenario options for 2020 to reducing the GHG emissions from current trend. The Scenario 1 shows 21% reduction from Business as Usual (BAU) and it also means 8% increase from 2005 level. The Scenario 2 shows 27% reduction from BAU (Return to 2005 level) and the Scenario 3 shows 30% reduction from BAU (4% reduction from 2005 level). There are two large industrial complex located at Gwangyang Bay Area and large numbers of GHG was generated from this region. The objectives of this study were to investigate the concentration distribution of CO₂ in ambient air and the GHG (CO₂, CH₄, N₂O) emissions from Gwangyang Bay Area (Yeosu, Suncheon and Gwangyang) in 2005.

2. Materials and Methods

CO₂ concentration was measured from the Yeosu Industrial Complex area (Y-1~Y-14), contrastive area (Y-15~Y-17), Gwangyang Industrial Complex area (G-1~G-5) and the Yeosu Expo area (E-1~E-9), a total of 31 sampling sites around the Gwangyang Bay Area by an infrared carbon monoxide/dioxide meter, Model COX-2 (Sibata, Japan). Sampling was carried out during June, August and November, once in each month for a total of 3 times. To ensure that the GHG emissions inventory is comparable to those of national GHG emissions data reported, the emission sector divides into 4 parts including energy, agriculture, waste and land use and forestry and the estimates presented in this study were calculated using methodologies are consistent with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories. In addition, we also used the way of questionnaire to obtain more detailed information. In order to verify the results, we should compare our results with the Greenhouse Gas-Clean Air Policy Support System (GHG-CAPSS), but it's difficult to achieve now.

3. Results and Discussion

Fig. 1 shows the concentration distributions of CO₂ at Gwangyang Bay Area. The CO₂ mean concentration varied from 378.5ppm to 394.6ppm and the mean concentration during August is lower than the concentration of any other month, it showed the similar concentration trends to the national data from Annmyon-do. Because the photosynthesis in summer is higher than in other seasons, with the increase of absorbing capacity of plant for CO₂ absorption, the CO₂ concentration in

summer is lower than the concentration of any other month. In addition, the average trend of the concentration distributions of CO₂ is shown to be in the order of Gwangyang Industrial Complex area > Yeosu Industrial Complex area > Yeosu Expo area > contrastive area, it was confirmed that the industrial activities have an effect on the atmospheric CO₂ concentration.

Fig. 2 shows the distribution of GHG emissions at Gwangyang Bay Area. There are approximately 62MT CO₂eq emission at Gwangyang Bay Area in 2005, and the GHG emissions proportion was in the order of Gwangyang > Yeosu > Suncheon. The energy sector including industry, transport, household and commercial is the single largest source of GHG emissions, accounting for approximately 99% of total GHG emissions from all emissions sources across the Gwangyang Bay Area. Energy-related activities are also responsible for CH₄ and N₂O emissions, but the proportion of the CH₄ and N₂O emissions is lower than 3% of the total GHG emissions from energy sector. As the CO₂ absorbing source, the land use and forestry sector removal of CO₂ about 0.2MT and it is lower than 0.3% of total GHG emissions at Gwangyang Bay Area in 2005.

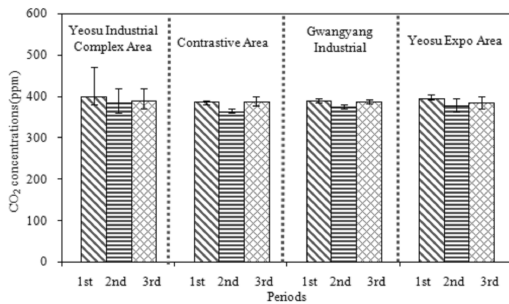


Fig. 1. Concentration distributions of CO₂(ppm). [Error bars denote the range(R) values].

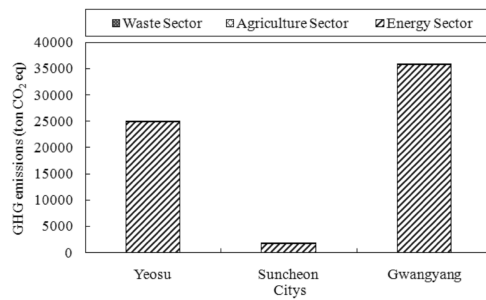


Fig. 2. Distribution of GHG emissions at Gwangyang Bay Area.

Acknowledgements

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

References

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