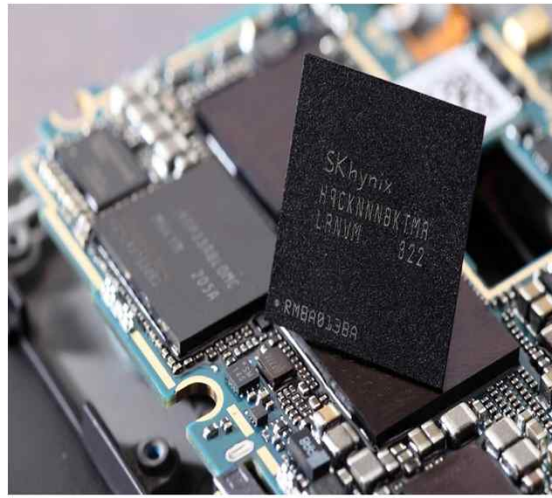


F gas Emission Trends

in the Republic of Korea

12th July 2017

Source of F gas Emissions



(Source: SK Hynix inc., LG Display Co., Ltd.)

- Refrigerants
- Semiconductor Manufacturing Process
- Display Manufacturing Process
- Electrical Equipment

Overview of the F gas Inventories

- Criteria Guideline
 - UNFCCC Reporting Guidelines on annual inventories (FCCC/SBSTA/2006/9)

- F gases Covered
 - HFCs, PFCs, SF₆

- GWP values Applied
 - IPCC Second Assessment Report (1995)

Overview of the F gas Inventories

- Years Covered
 - Base year and all years until two years prior the year of the relevant report
 - HFCs, SF₆ : 1990~2014
 - PFCs : 1992~2014
- Sectors Covered
 - Industrial Processes
 - (2C) Metal Production
 - (2E) Production of Halocarbons and SF₆
 - (2F) Consumption of Halocarbons and SF₆



< 2016 NIR >

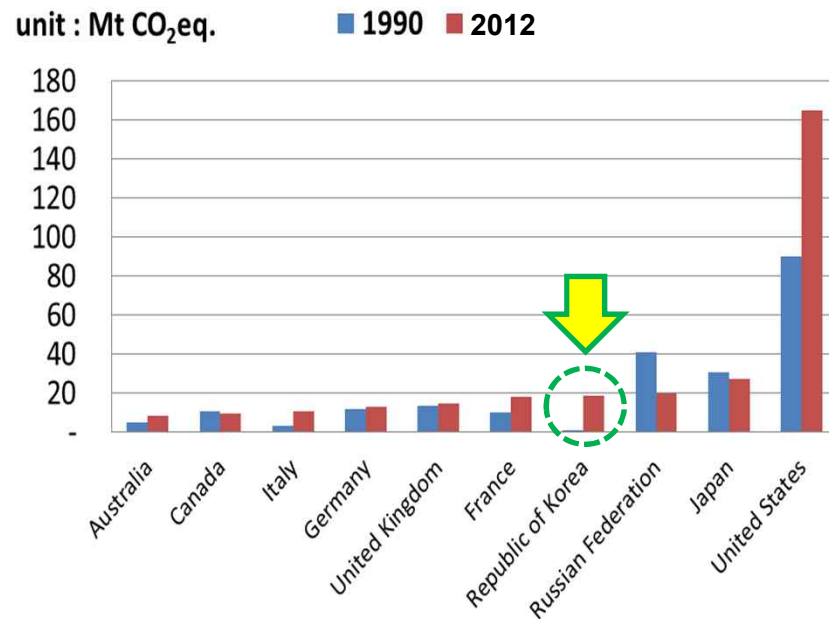
F gas Inventory Methodology

- 1996 IPCC GL : General categories (2C,2E,2F)
 - Method : Tier 1
 - Emission factor : IPCC default, Plant specific
 - Activity data : Association's data, TMS and ETS data

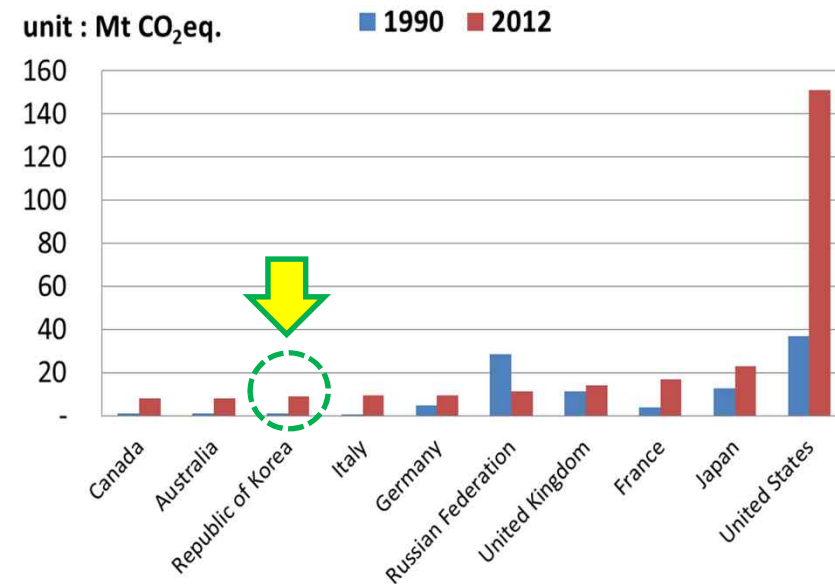
- 2006 IPCC GL : Semiconductor and Display Manufacture (2F7),
Electrical Equipment (2F8)
 - Method : Tier 2 and Tier 3 for 2F7, Tier 1 for 2F8
 - Emission factor : IPCC default, Plant specific
 - Activity data : Association's data, TMS and ETS data
 - * TMS : Greenhouse Gas and Energy Target Management System
 - * ETS : Emission Trading Scheme

F gas Emission Rankings

< Sum of HFCs, PFCs, SF₆ >



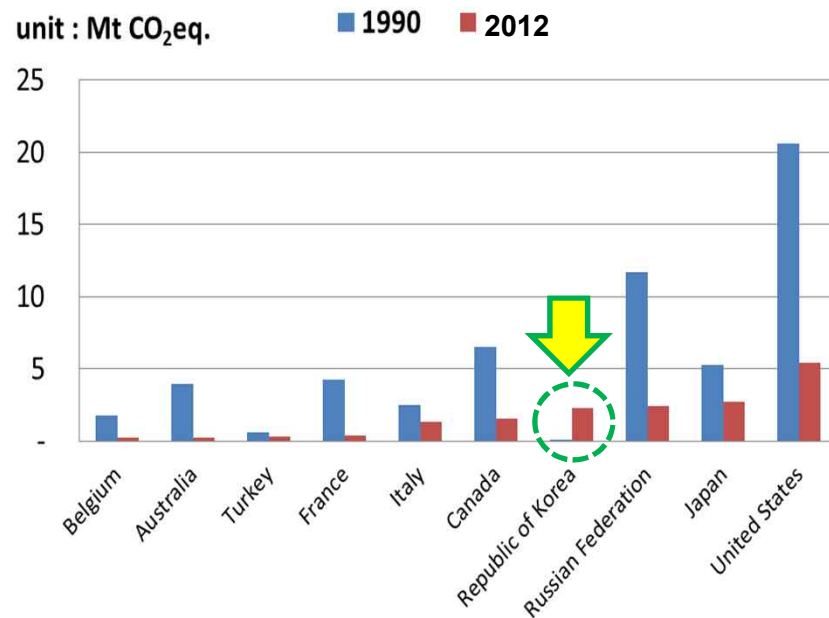
< HFCs >



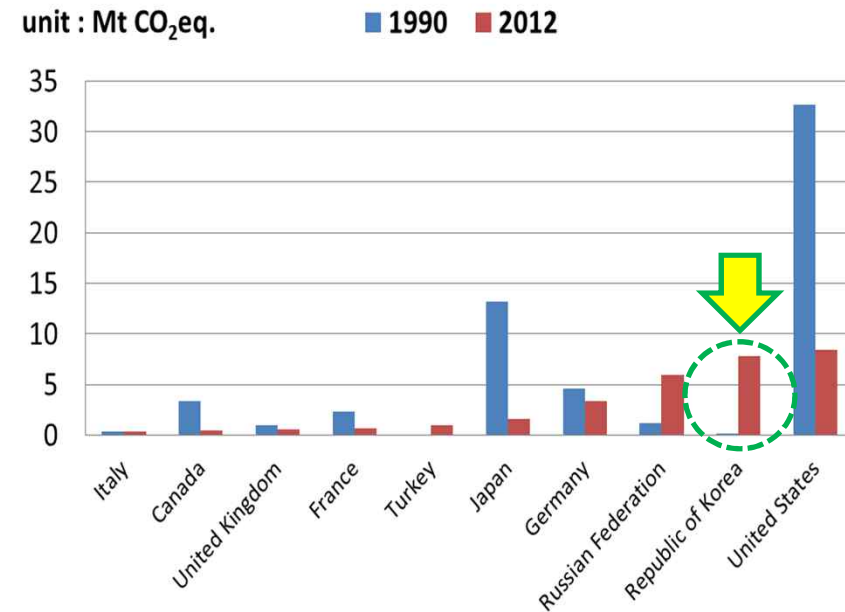
(UNFCCC Annex I parties' F gas emissions data)

F gas Emission Rankings

< PFCs >

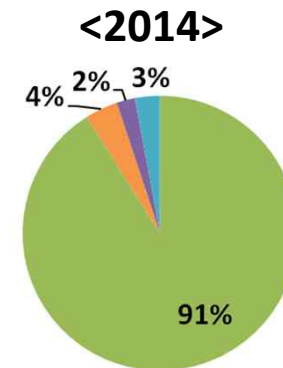
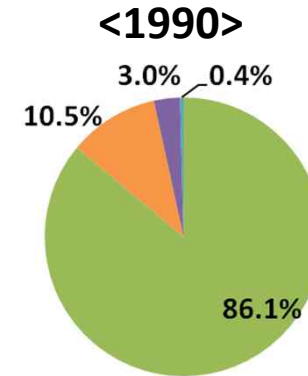
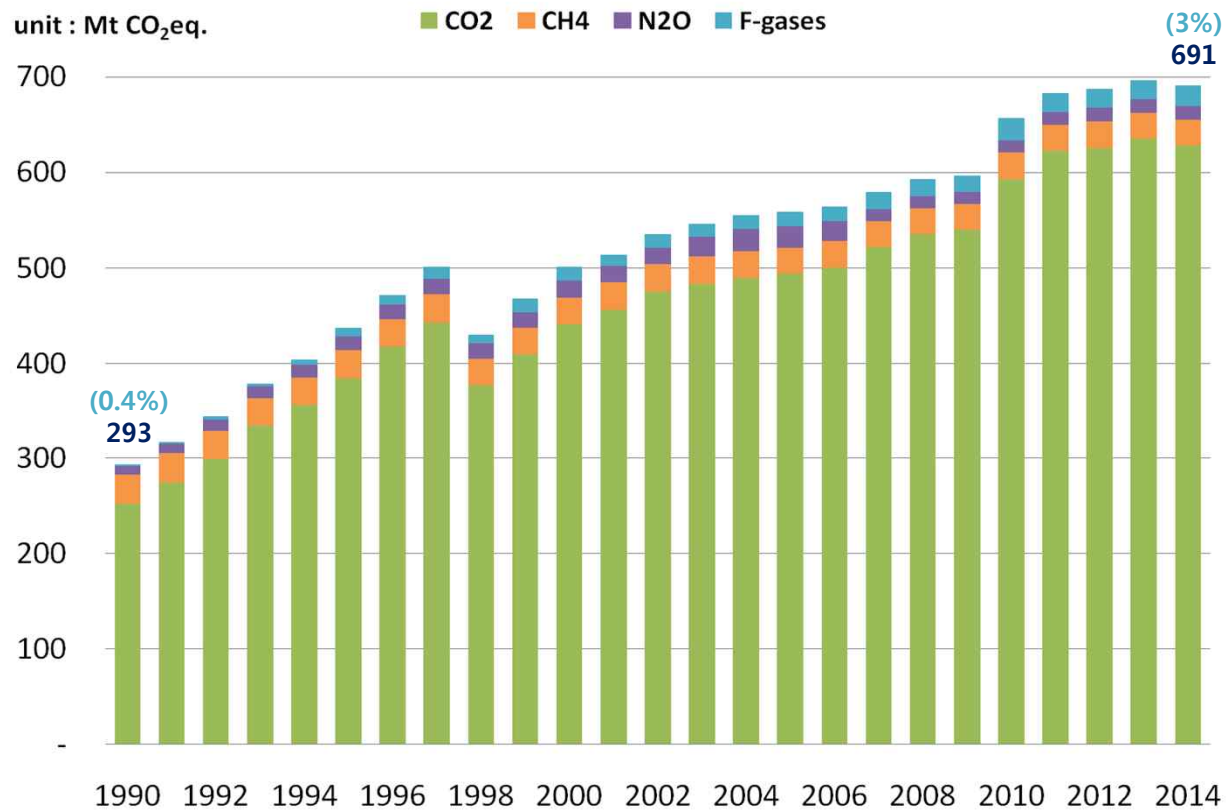


< SF₆ >

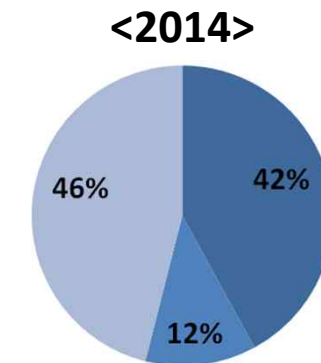
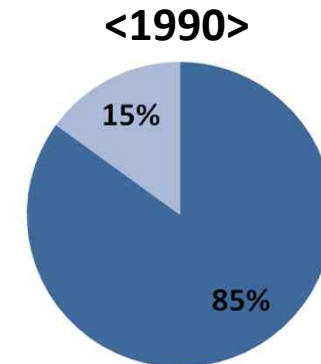
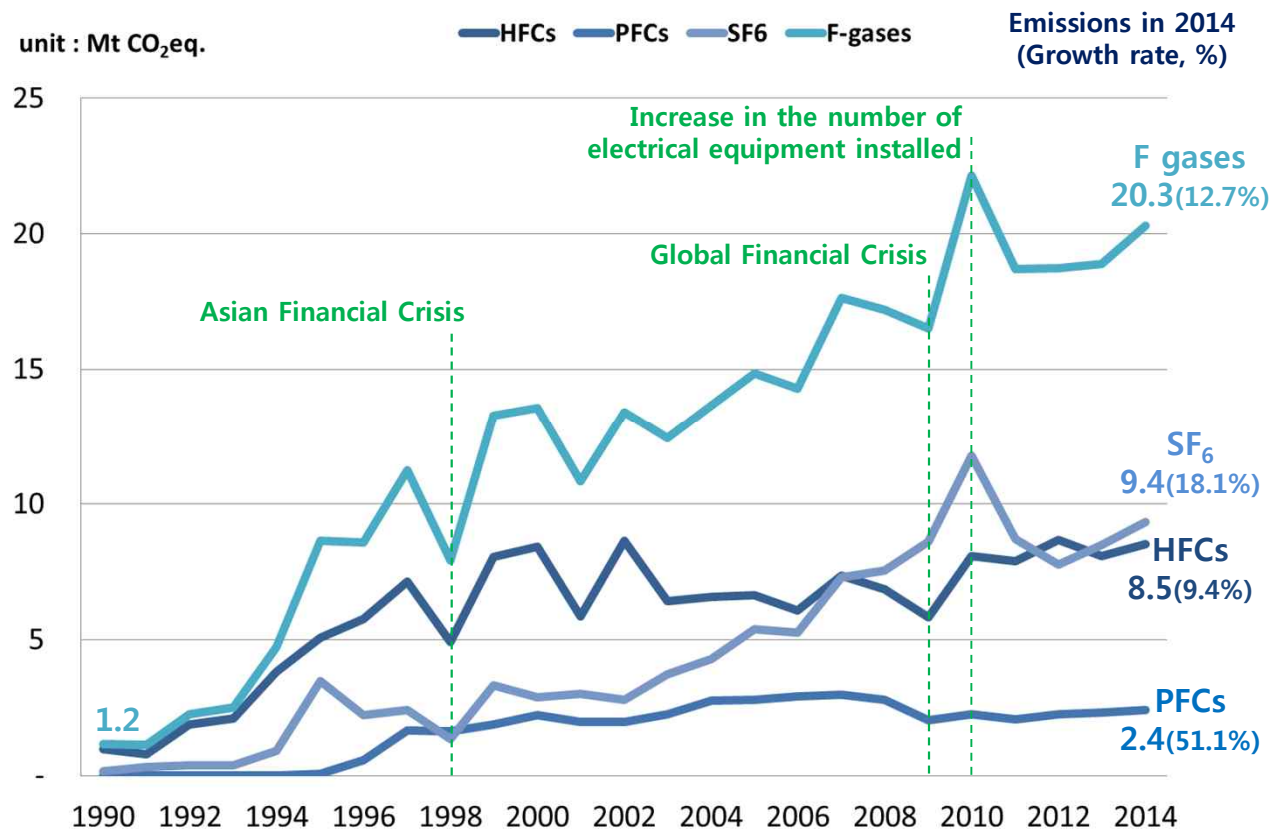


(UNFCCC Annex I parties' F gas emissions data)

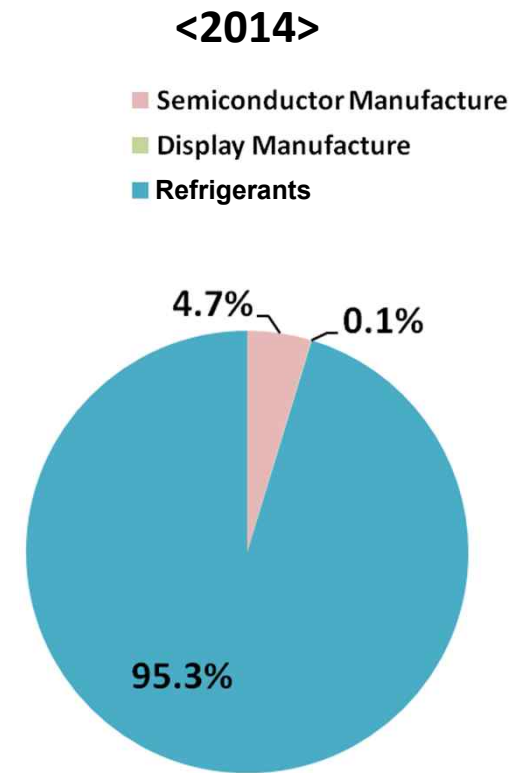
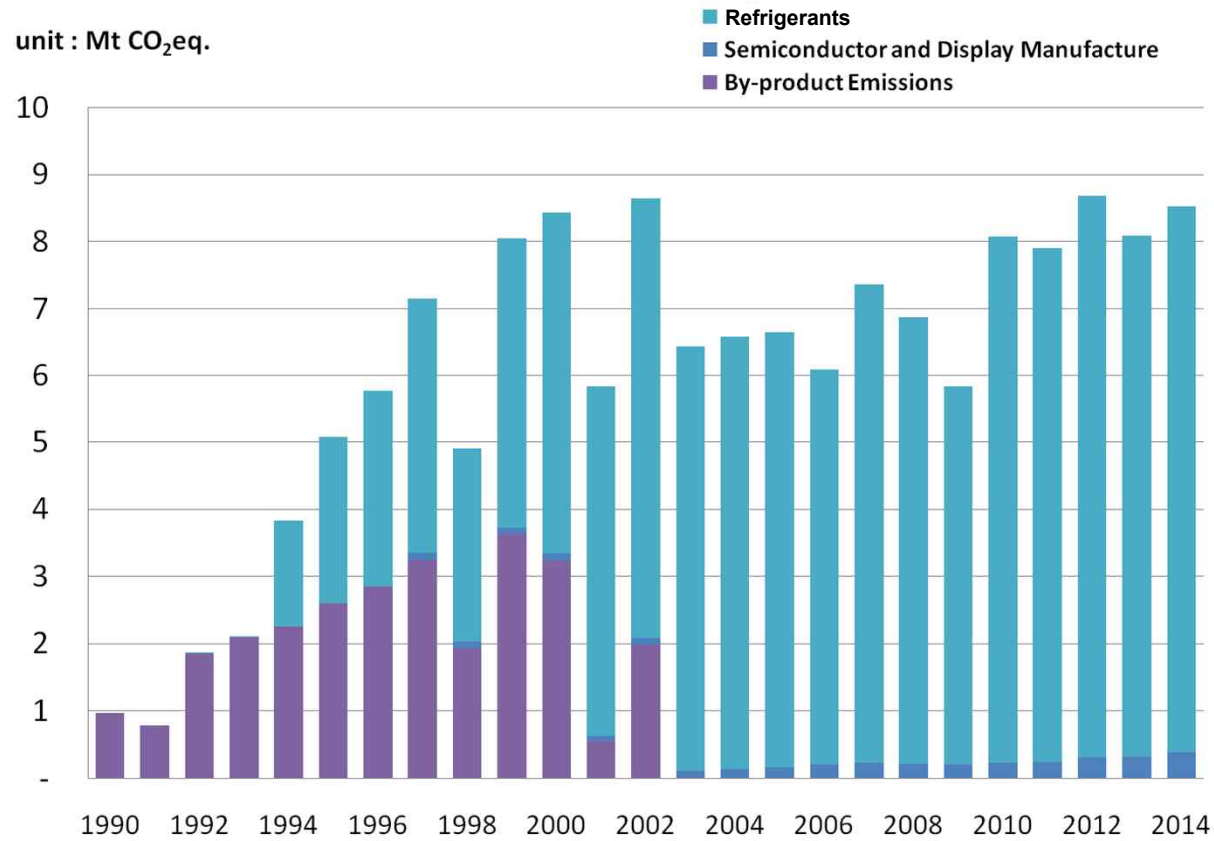
Total Emission Trends by Gas



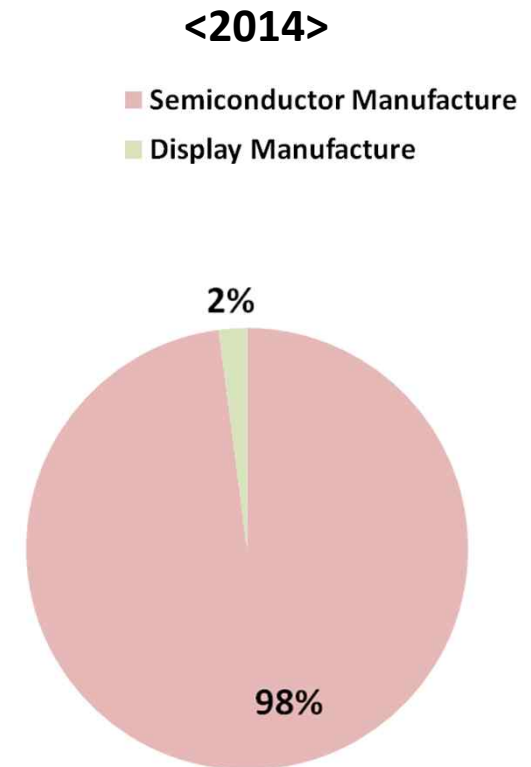
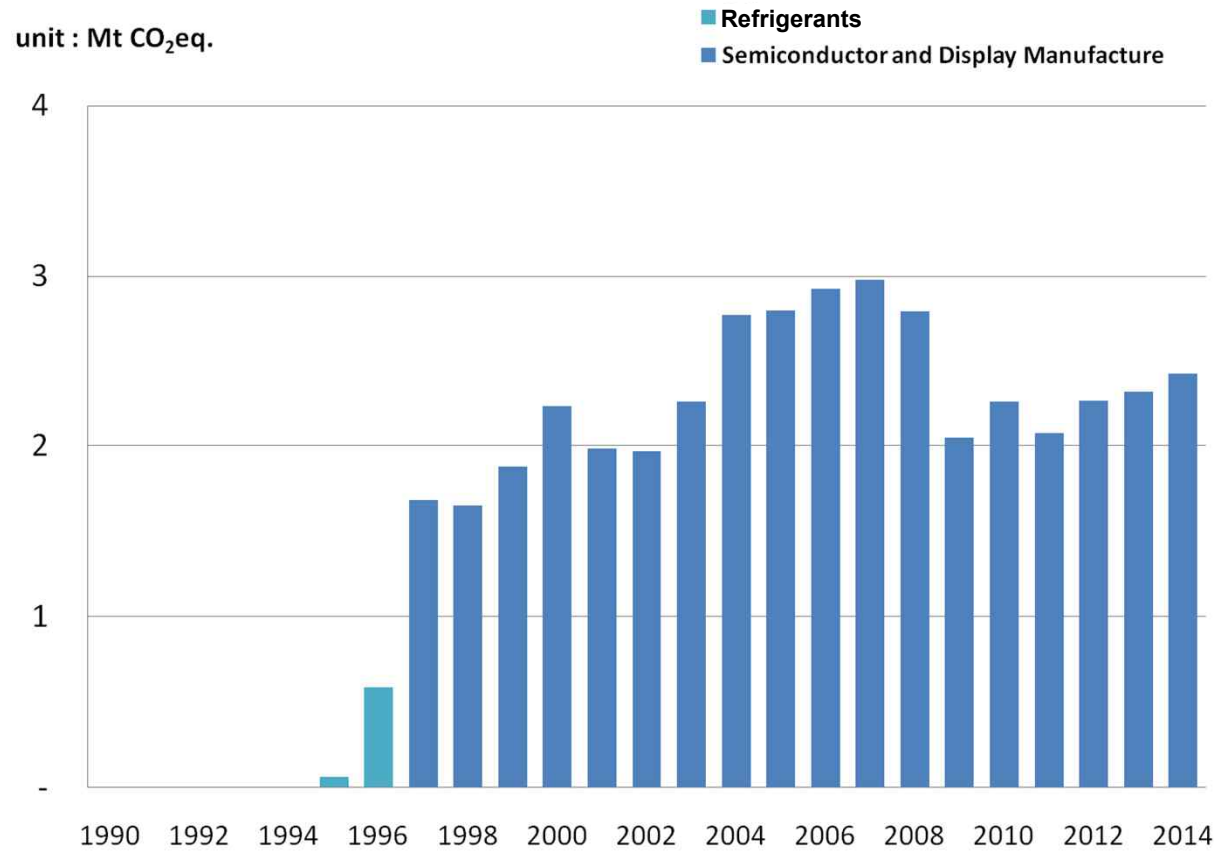
F gas Emission Trends by Gas



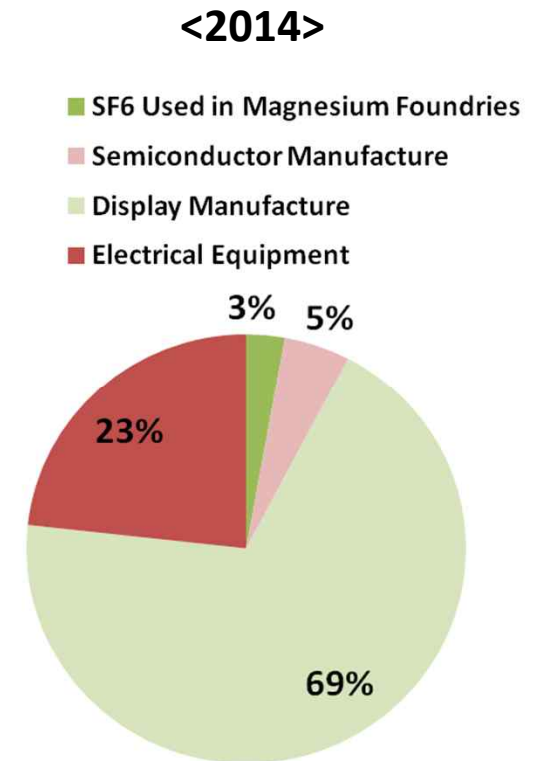
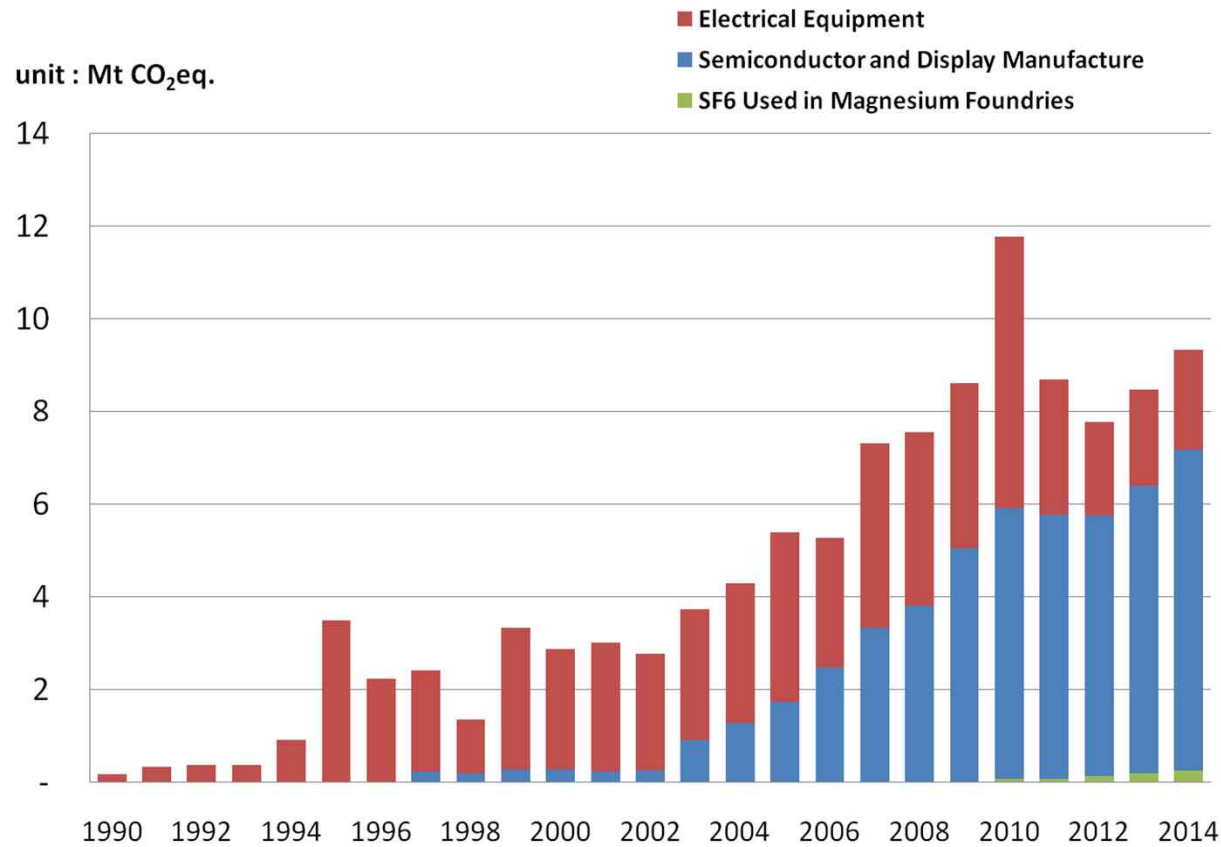
HFC Emission Trends by Sub-categories



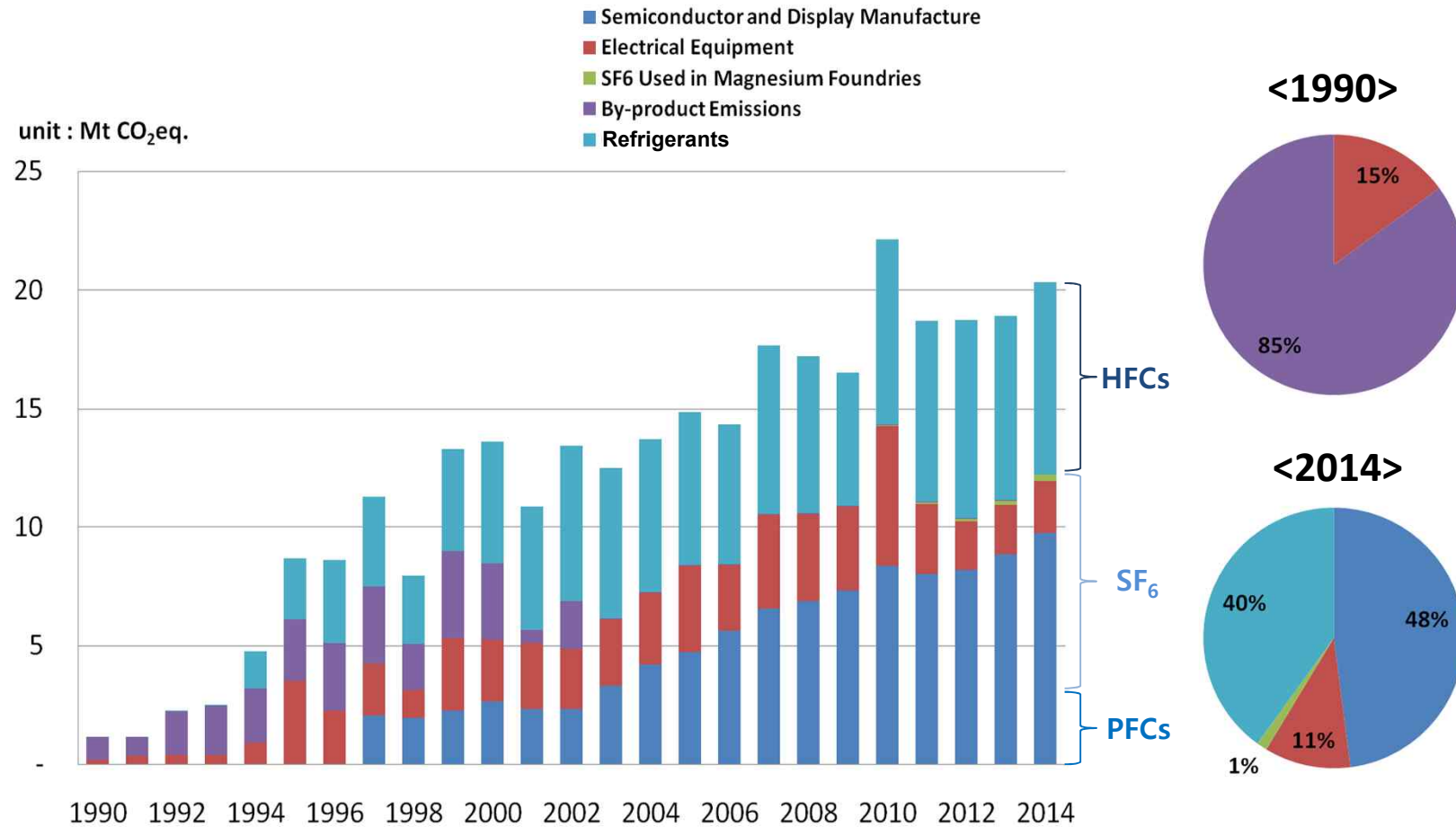
PFC Emission Trends by Sub-categories



SF₆ Emission Trends by Sub-categories



F gas Emission Trends by Sub-categories



Improvement Plan

- Completeness
 - Try to acquire the activity data
 - (2C3) Aluminium Production (PFCs, 1990)
 - (2C4) SF₆ Used in Aluminium Foundries (1990)
 - (2E2) Fugitive Emissions
 - (2F1~2F6) ODS substitutes by category (refrigeration, foam blowing, etc.)

- Uncertainties
 - Most of the uncertainties are not calculated when collecting activity data from companies or an agency
 - Will review and improve the method

Thank you