



Inventory of fluorinated greenhouse gases in Finland

Päivi Lindh 27.8.2014
Statistics Finland





F-gas inventory in Finland

- Calculated at the Finnish Environment Institute (Tommi Forsberg)
- Coordinated by the Statistics Finland
- Activity data received via surveys to companies
- Calculation methods based on IPCC Guidelines





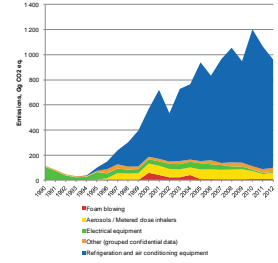
F-gas emissions (HFC, PFC, SF6) in Finland

- Emissions of consumption of Halocarbons and SF₆ to 1.0 Tg CO₂ eq in 2012

- 1.6% of the total greenhouse gas emissions in Finland

- No manufacturing of F-gases, primary aluminium and magnesium industry in Finland

- Part of the emission data reported aggregated due to confidentiality





Inventory of f-gases – surveys

- Finnish F-gas inventory is based on 8 different surveys send to companies
 - From 2002 on, all surveys in electronic form in 2012
 - Refrigeration and air conditioning (~350), mobile air conditioning (~25), foam blowing (~20), aerosols and metered dose inhalers (~20), electrical equipment (~10), semiconductor manufacturing (<5), Fire prevention systems (<5), speciality gases for e.g. semiconductor manufacturing, window glass manufacturing, magnesium die-casting, other (<10)
 - e.g. importers and exporters both in bulk and equipment, equipment manufacturers and service companies, car importers
- No legislative obligation for companies to report data
 - Response activity approximately 70%, missing data imputed





Emission calculation (1/2)

- Refrigeration and air conditioning (2F1)
 - Includes domestic, commercial and industrial refrigeration systems, stationary and mobile air conditioning, heat pumps
 - Before inventory 2013 data are not collected for separate subcategories → better response rate
 - IPCC Top-down Tier 2 method (~material balance)
 - Emissions = production + imports – exports – destruction ± storage
- Foam blowing (2F2)
 - HFC emission from foam blowing and use of HFC-containing products
 - IPCC Tier 2 method
 - IPCC default emission factors – National EFs are not available
 - Emissions from closed-cell foam = [(total HFCs and PFCs used in manufacturing new closed-cell foam in year t) * (first-year loss EF)] + [(original HFC or PFC charge blown into closed-cell foam manufacturing between year t and year t-n) * (annual loss EF)] + [(decommissioning losses in year n) – (HFC or PFC destroyed)]





Emission calculation (1/2)

- Emissions from aerosols and metered dose inhalers
 - Includes technical and novelty aerosols, one-component polyurethane foam, tear gas and metered dose inhalers
 - IPCC Tier methods
 - $X = (1 - f)a + fb$, where $f = 0.5$,
 $a = \text{Tier 1b emission in year } t-1$
 $b = \text{Tier 1b emission in year } t$
- Emissions from electrical equipment
 - SF6 emissions from manufacturing, use and disposal
 - Previously IPCC Tier 3c (country-level mass-balance) → 2013 inventory EF based method