

Montreal Protocol and Climate Phasing-out HCFC: Initiatives for Success

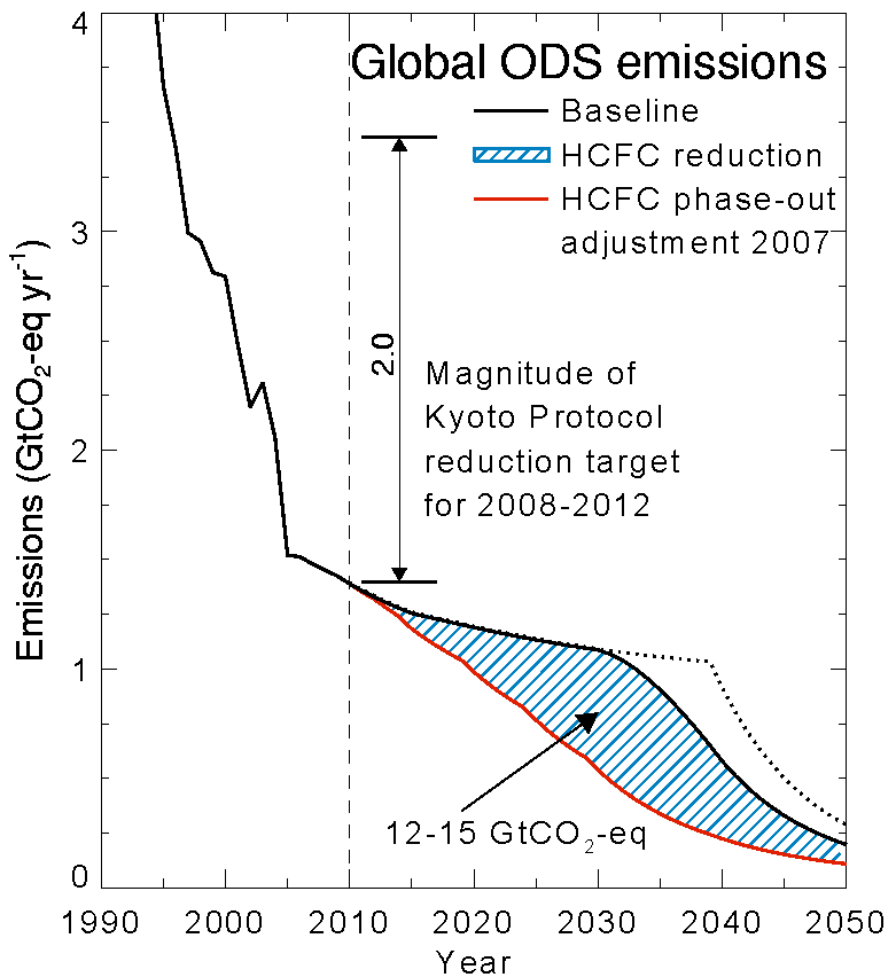
Technical Meeting on HCFC Phase-out,
Montreal
5 April 2008

Husamuddin Ahmadzai

MP achievements

- Phased out 95% of ozone-depleting substances in 20 years
- Placed the ozone layer on a path to return to pre-1980 levels by 2065.
- Reduced climate emissions by a net of 135 GtCO₂-eq. from 1990 to 2010.
- Delayed climate change by 7-12 years (and by 35-41 years if voluntary and domestic measures in the 1970s are taken into account)

MP: HCFC Adjustment .



21 September 2007

- Production and Consumption
- n-A5 and A5 Parties
- 2030 – 2020; 2040 -2030
- Freeze 2012

Emission reductions:

- 7-9 million tonnes HCFC
 - 12-18 G tonnes CO₂-eq.
 - Equal to 100 M cars/y
 - Recovery of ozone layer 3 y.
- Ref. Velders et. al.

Additional Opportunity

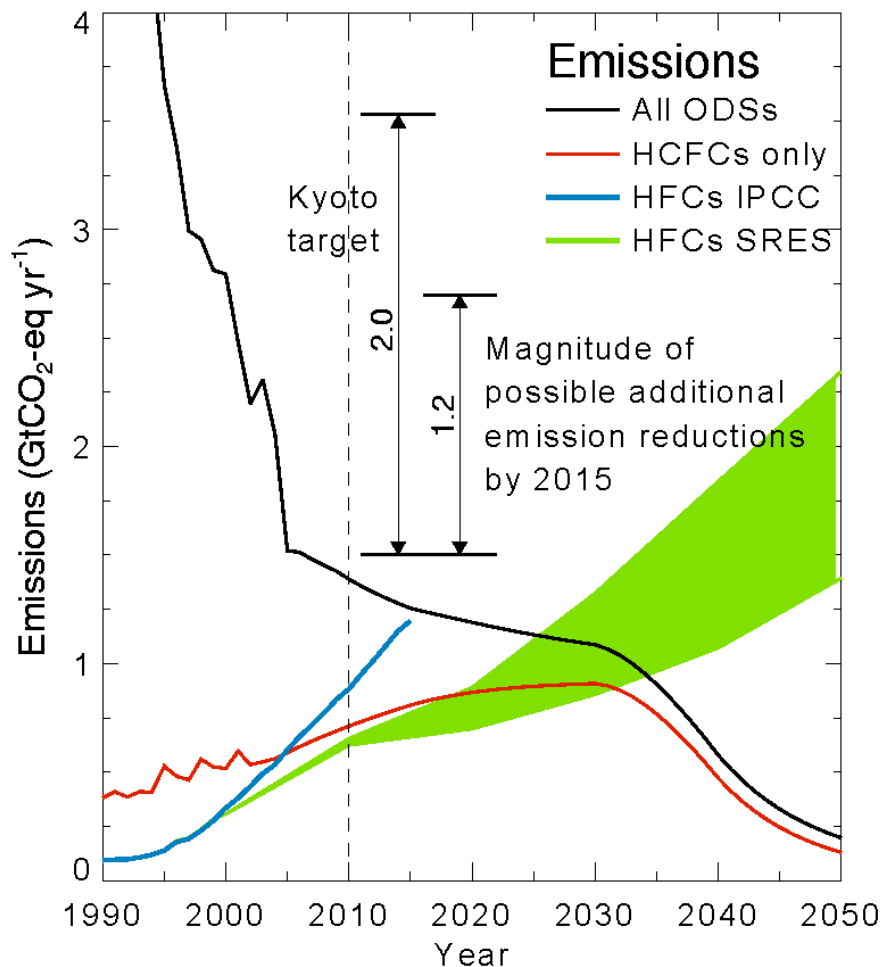
- Containment
- Low GWP alt.
- Destruction of banks and stocks

Integral reduction:

0,5 M t ODP,

Up to 18 G t CO₂ eq

- CFC, HCFC etc
- HFC 23 (HCFC)
- HFC alternatives.

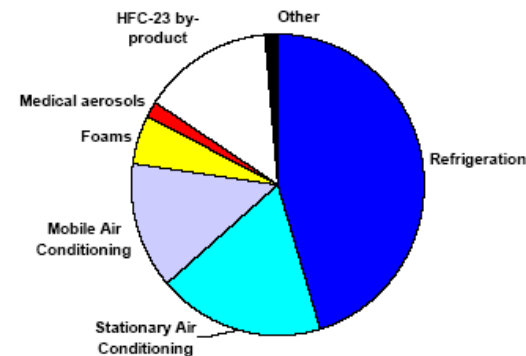
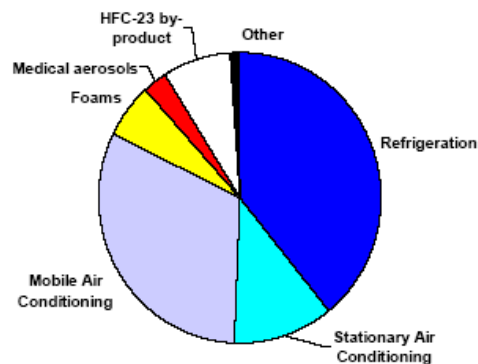
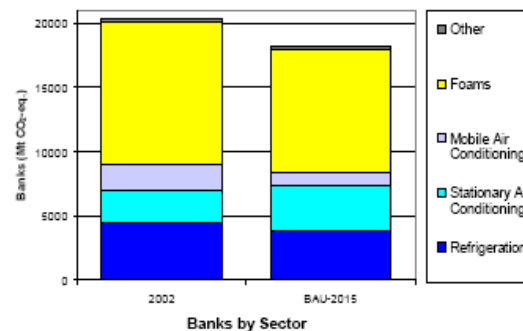
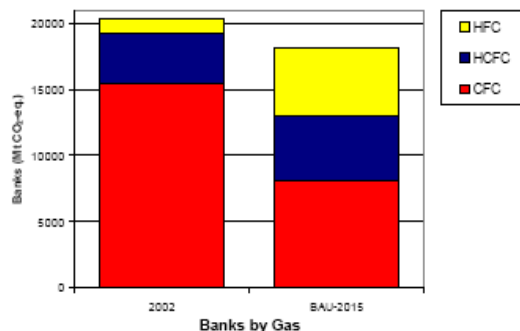


Banked ODS-GWS <TEAP>

2002: Global

- 21 Gt CO₂-eq
(CFC: 15 Gt
HCFC: 4
PFC: 5)

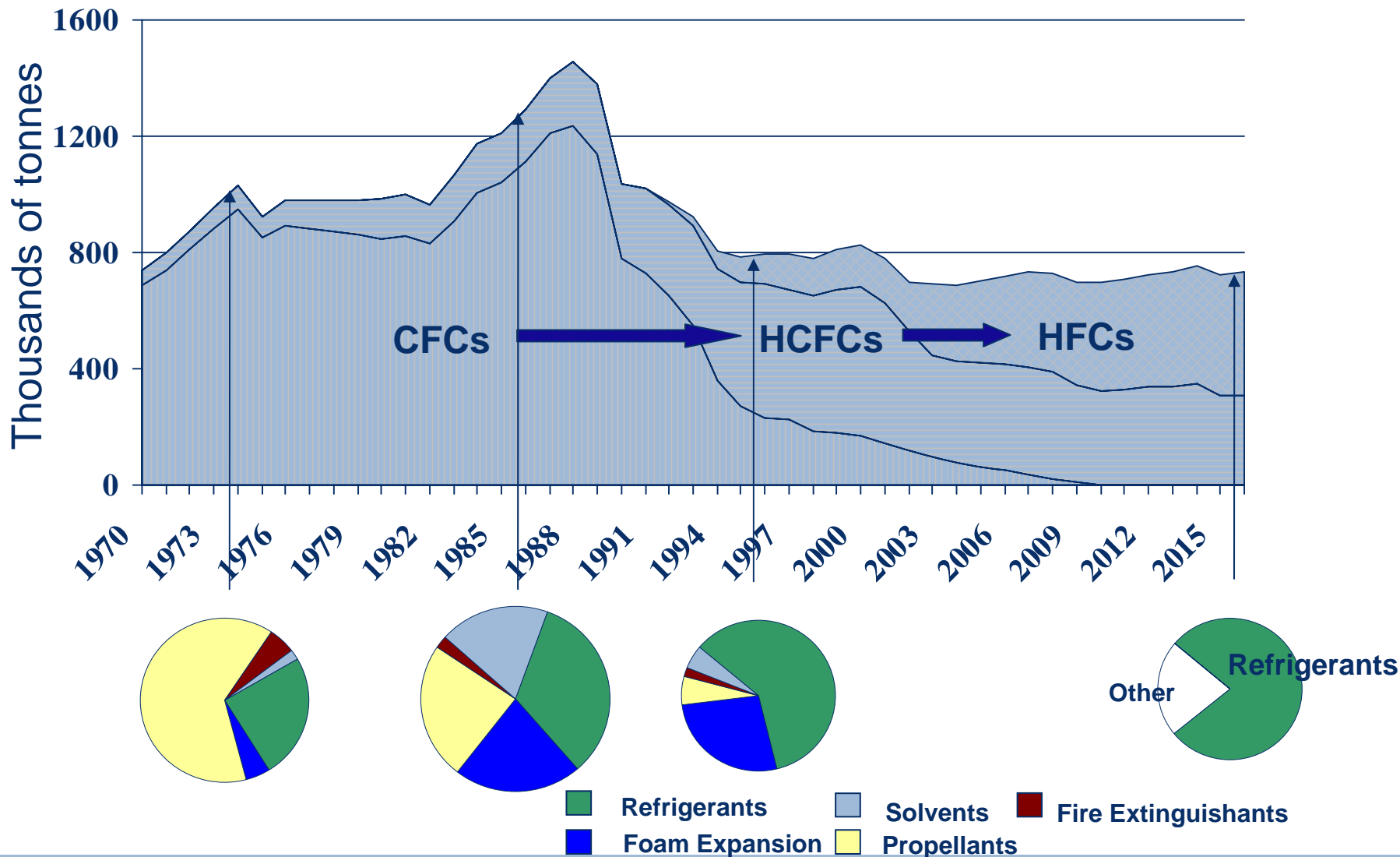
Emissions
2,3 G tonnes
(CO₂ eq/y)



Emissions 2002 : 2.5 GtCO₂-eq.

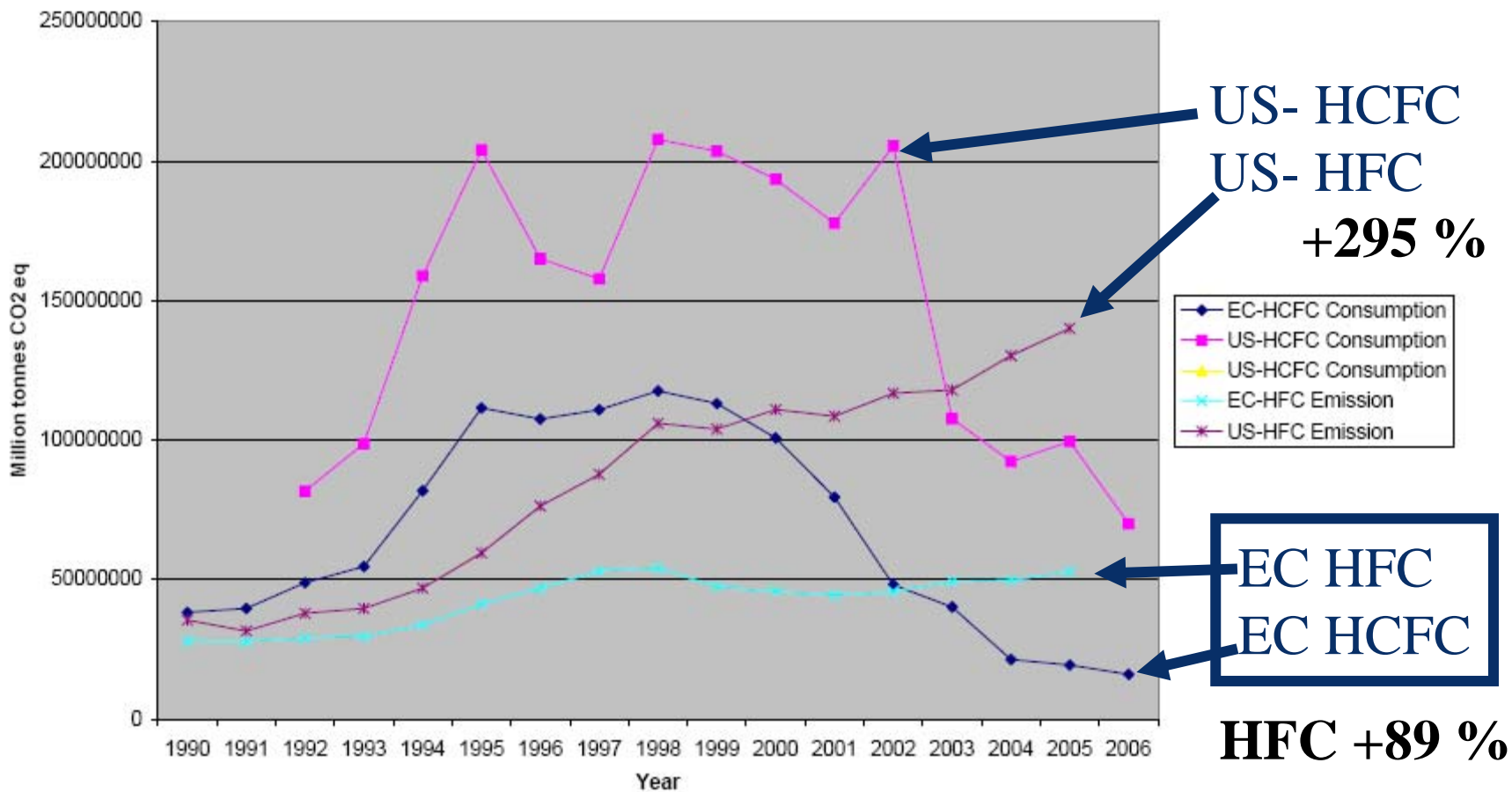
Emissions BAU-2015 : 2.3 GtCO₂-eq.

Figure SPM-3. Greenhouse gas direct-GWP weighted banks (top) and direct emissions (bottom), related to the use of ODS and ODS substitutes. Breakdown per group of greenhouse gases (CFCs, HCFCs and HFCs) and per emission sector. Historic data for 2002 and Business-As-Usual (BAU) projections for 2015. 'Other' includes Fire Protection, Non-Medical Aerosols and Solvents.



An Industry in Transition

HCFC Phase-out; HFC emissions for the EC and the US



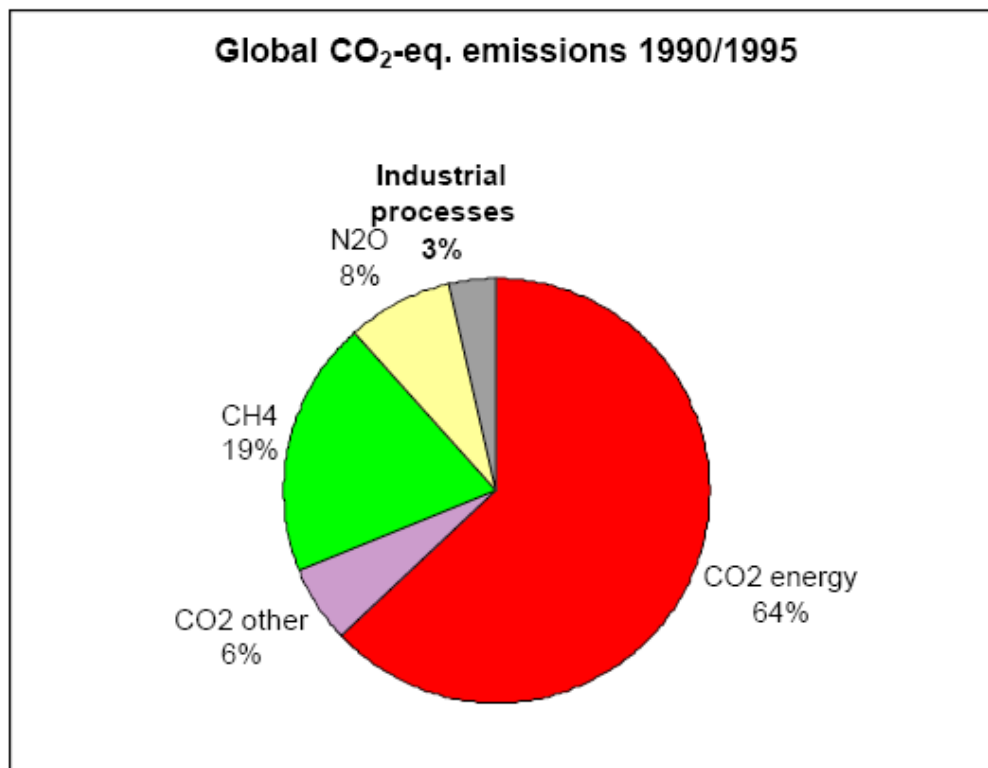


Figure 1. Global CO₂-eq. emissions in 1990 (F gases: 1995). (Source: EDGAR 3.0)

Caution

1. Technology: TEAP cautions that up to **70%** [**80%**] of the replacements of HCFCs are likely to be global warming.
2. 2002-2004 estimates (e.g. UBA) : F-gases could contribute **6 -15%** of world wide GWP by 2050 (50-17 Gt/y CO₂-eq, developing- & industrialised countries) i.e. 4 -10 Gt/y

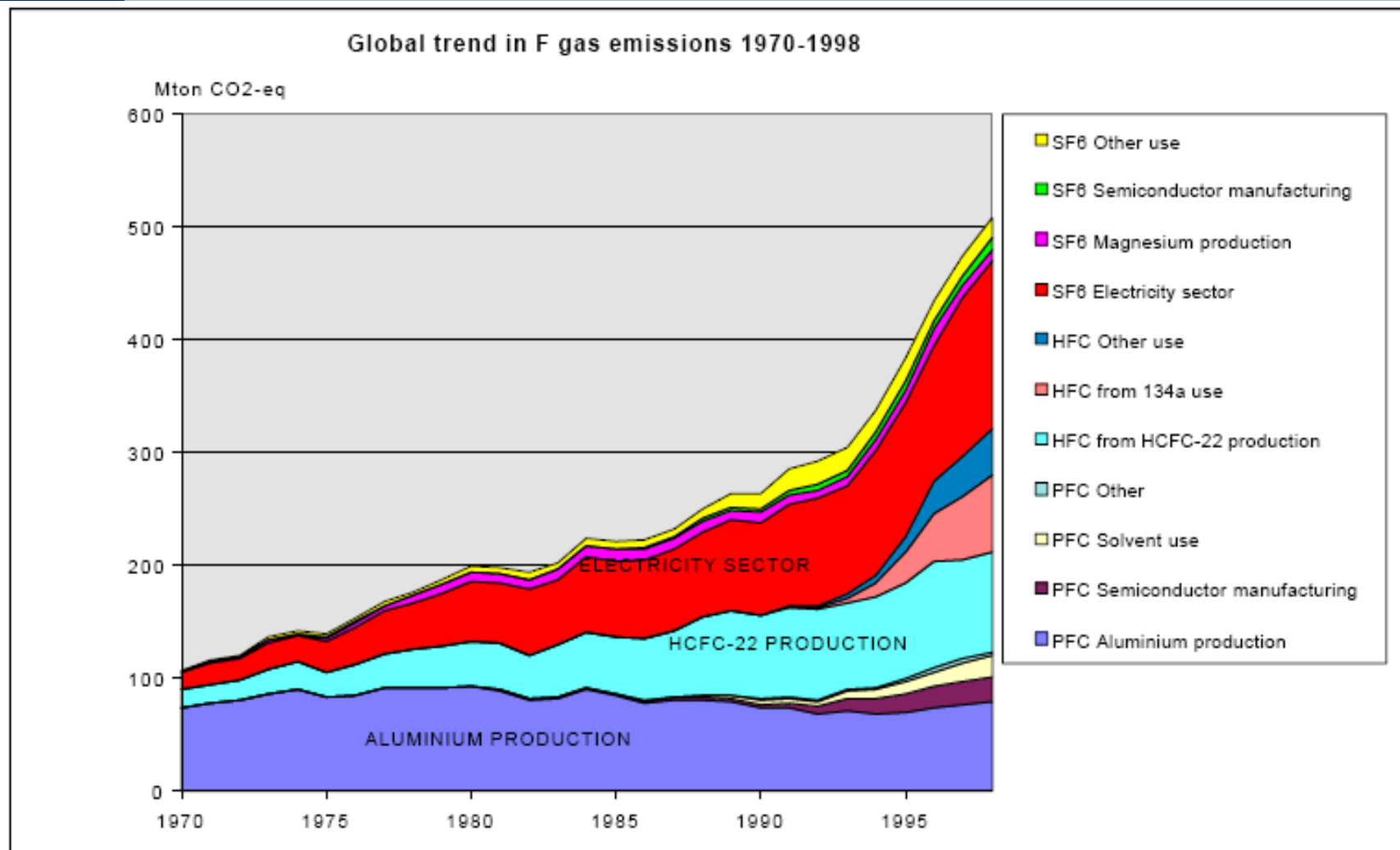
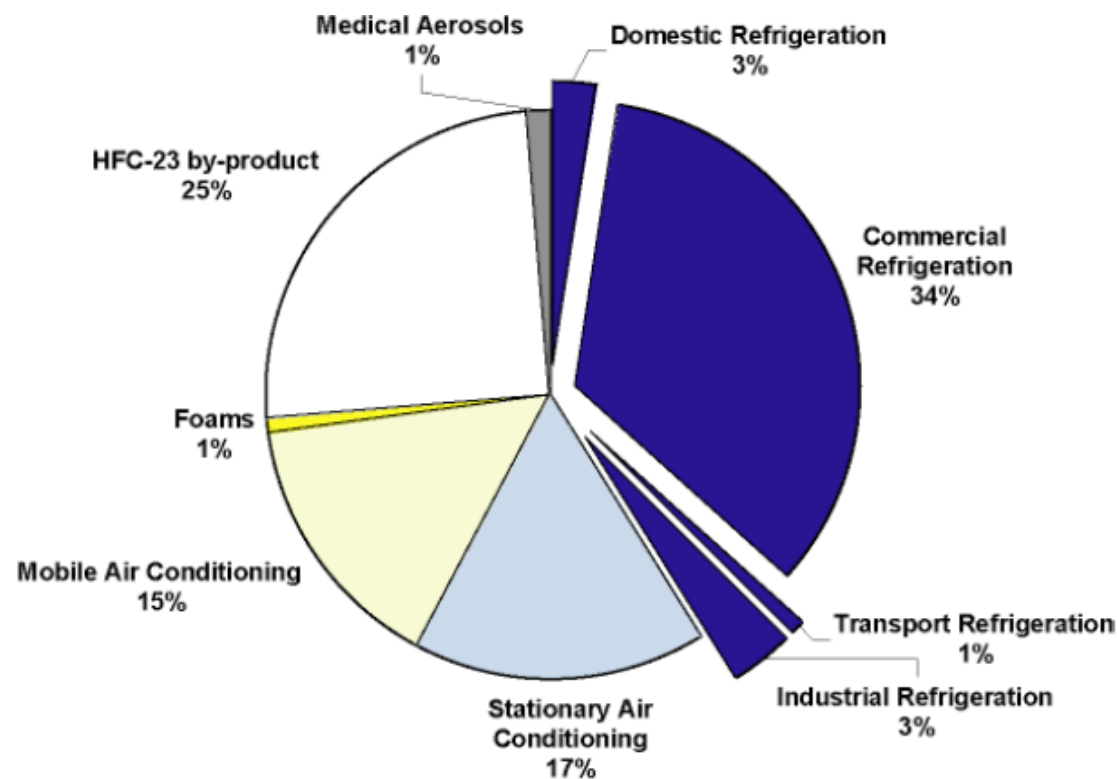


Figure 6. Global trend in F gas emissions, 1970-1998, per source category. (Source: EDGAR 3.0)



Sectoral Emission Reduction Potentials 2015

Figure SPM-5. Sectoral reduction potentials for direct emissions of CFCs, HCFCs, and HFCs in 2015 as compared to the BAU projections. The overall reduction potential is about half ($1.2 \text{ GtCO}_2\text{-eq yr}^{-1}$) of the BAU direct GHG emissions.

Best Practice Reduction Potential 2015

1. Application of current best practices & recovery methods, reduction potential of up to 1.2 Gt CO₂-eq/y by 2015:
 - 60 % of potential concerns HFC emissions
 - 30 % of potential concerns HCFC
 - 10 % of potential concerns CFCs

Some Cost Figures (red. potential: 2015)

1. Aluminium Sector; from 1.2 to 0.2 kg PFC/t:
 - Reduction potential: about 50 MtCO₂ eq/y
 - Cost: 6 €/tCO₂;
2. HCFC Production sector and destruction of HFC-23:
 - Reduction potential: 300 MtCO₂ eq/y
 - Cost: 0.2 €/tCO₂;

Cost Figures - 2- (red. potential: 2015)

3. Foam sector

- Reduction potential 10 MtCO₂/y
- Cost range 10-100 €/t CO₂;

4. Refrigeration sector

- Reduction potential 490 Mt CO₂/y
- Cost range 10-300 €/t CO₂.

Current Ideas: Ozone-Climate

HCFC ADJUSTMENT URGES CLIMATE FRIENDLY ALTERNATIVES

- Substance [Sector] approach (like in MP, control production and consumption) under the UNFCCC
- New elements (e.g, destruction offsets, energy efficiency)
- Combination of regimes, substance - performance
- Assessment instrument (TEAP in MP)
- Pros and Cons. What benefits the environment most.

ALTERNATIVES at hand, e.g.

- Natural refrigerants, design.
- Foams: not-in-kind and natural blowing agents.
- Domestic & small refrigerators: natural refrigerants.

SIGNAL TO MARKET

- Chillers
- Lessons from the early days of Montreal Protocol

SUMMARY

- Driving F-gas regulations (Start and Strengthen)
- MP Multilateral Fund (MLF) - Executive Committee Guidelines
- Destruction - Energy Efficiency (MLF, Stockholm Convention, other)
- Financing (MLF, GEF, Flex.Mex incl. Voluntary, POP windows, FDI)
- Monitoring and reporting
- Information Exchange, The EC Workshop. Help Desk.
- Sweden - Implementation Agency Initiatives (with UNEP, UNDP, UNIDO, World Bank, Bilateral, other)