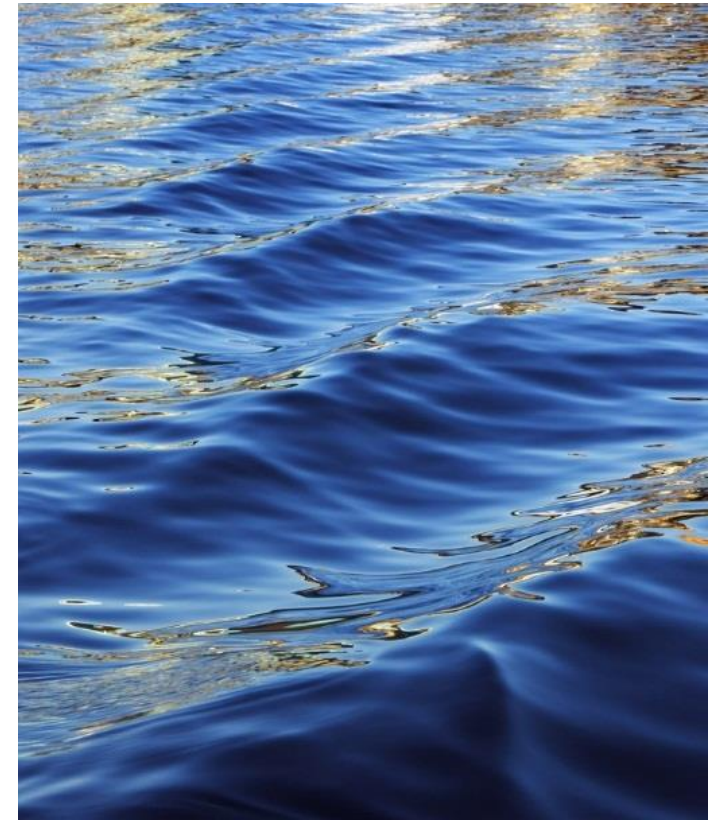


HFC- 23; Mitigation measures by India

Presented by:
Ashish Saraswat, Project Manager (Cooling)
The Energy and Resources Institute (TERI)- India



Background

- Montreal Protocol initiated phasing out of ODS – CFCs globally.
- Subsequent HCFC phase out is undergoing with HFCs being the next substitute for HCFCs .
- Refrigeration, air-conditioning and heat pumps are the key markets using HCFC and HFCs.
- Extreme temperatures and need of thermal comfort thereto, would lead to increased future demand for AC / Refrigeration in developing countries, increasing the HFC usage.
- HFCs have high to very high Global Warming Potential (4 to 12400).
- Kigali amendment to Montreal Protocol controls HFCs in developed and developing countries.
- Low GWP refrigerants are the next generation non- HFC refrigerants.

India's Actions - climate friendly substances

- India falls under Article 5 Countries

S. N	ACTIVITY	Year
1	Initial ratification of Montreal Protocol by India	1992
2	Beginning of Phase out of CFC	1999
3	Completion of phase out of CFCs by developing countries	2010
4	Beginning of phase down of HCFC	2013
5	Completion of phase down of HCFC	2030
6	India ratifies Kigali Amendment to Montreal Protocol to complete its phase down of HFCs in 4 steps from 2032 onwards with cumulative reduction of 10% in 2032, 20% in 2037, 30% in 2042 and 85% in 2047.	2021

India Cooling Action Plan- a 20-year perspective linking national development goals with the ozone and climate agenda.

- The ICAP's headline goals include:

- ☐ *Reduction in cooling demand of 20-25% by 2037-38*
- ☐ *Reduction in cooling energy demand of 25-40% by 2037-38*
- ☐ *Reduction in refrigerant demand by 25%-30% by 2037-38*

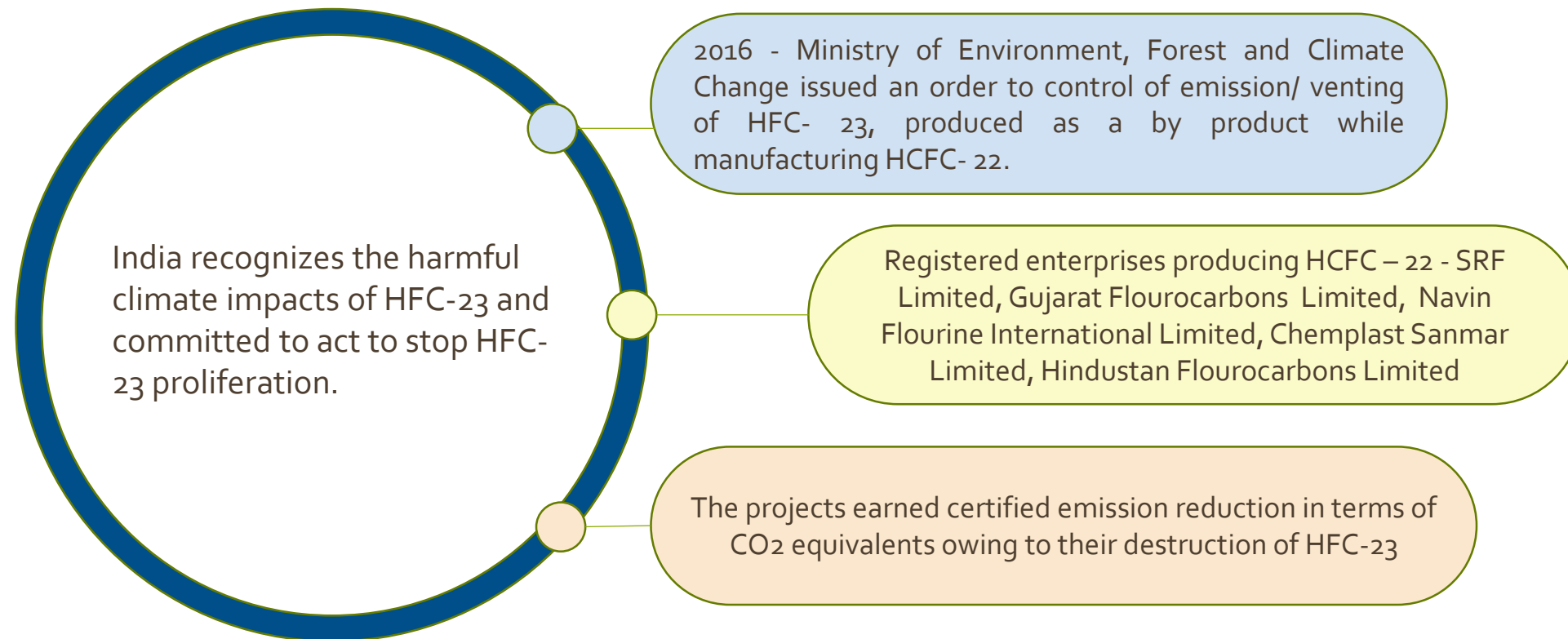
- Under ICAP, seven different Thematic Areas have been identified which are;

- ☐ *Space cooling in buildings*
- ☐ *Air- conditioning technology*
- ☐ *Cold Chain & Refrigeration*
- ☐ *Transport Air Conditioning*
- ☐ *Refrigeration & Air Conditioning Servicing Sector*
- ☐ *Refrigerant Demand and Indigenous production*
- ☐ *Research & Development*

HFC – 23

- HFC-23 is a by-product during the manufacture of HCFC-22.
- HFC-23 (trifluoromethane) – has a high GWP of 14800 thus require to be controlled.
- Global best available technologies and maintenance practices allow 99.99% of HFC-23 to be destroyed.
- Cost effective technology to destroy HFC-23 is readily available, and already installed in most of facilities worldwide.
- Globally, incineration technology has been deployed in many HCFC-22 plants to destroy this powerful by-product.
- Under the Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change (UNFCCC), incinerators for HFC-23 destruction were installed at 19 HCFC-22 refrigerant facilities in China, India, South Korea, Argentina and Mexico.

India and HFC -23



HFC- 23 control order 2016

- Directed the four HCFC – 22 producers to destroy HFC-23 as a by product; through incineration using thermal oxidation or alike technologies.
- The downtime of incineration plants to be kept below 10% though proper maintenance.
- Plants to create and maintain sufficient storage capacity to ensure that all HFC- 23 is stored during any unauthorized incineration shutdown to prevent any unwanted venting of HFC – 23.
- Plants must certify the status of HFC- 23 production in each category i.e. incinerated or used as feedstock or used for any other purpose; under ODS 2000.
- HFC- 23 may be used as feedstock fro production of other chemicals.
- Compliance & Inspection authority – SPCB/ CPCB

Thank you