



# **Challenges for India in Meeting HCFC Phaseout Commitments and Addressing Global Climate Change**

Mack McFarland, Ph.D.

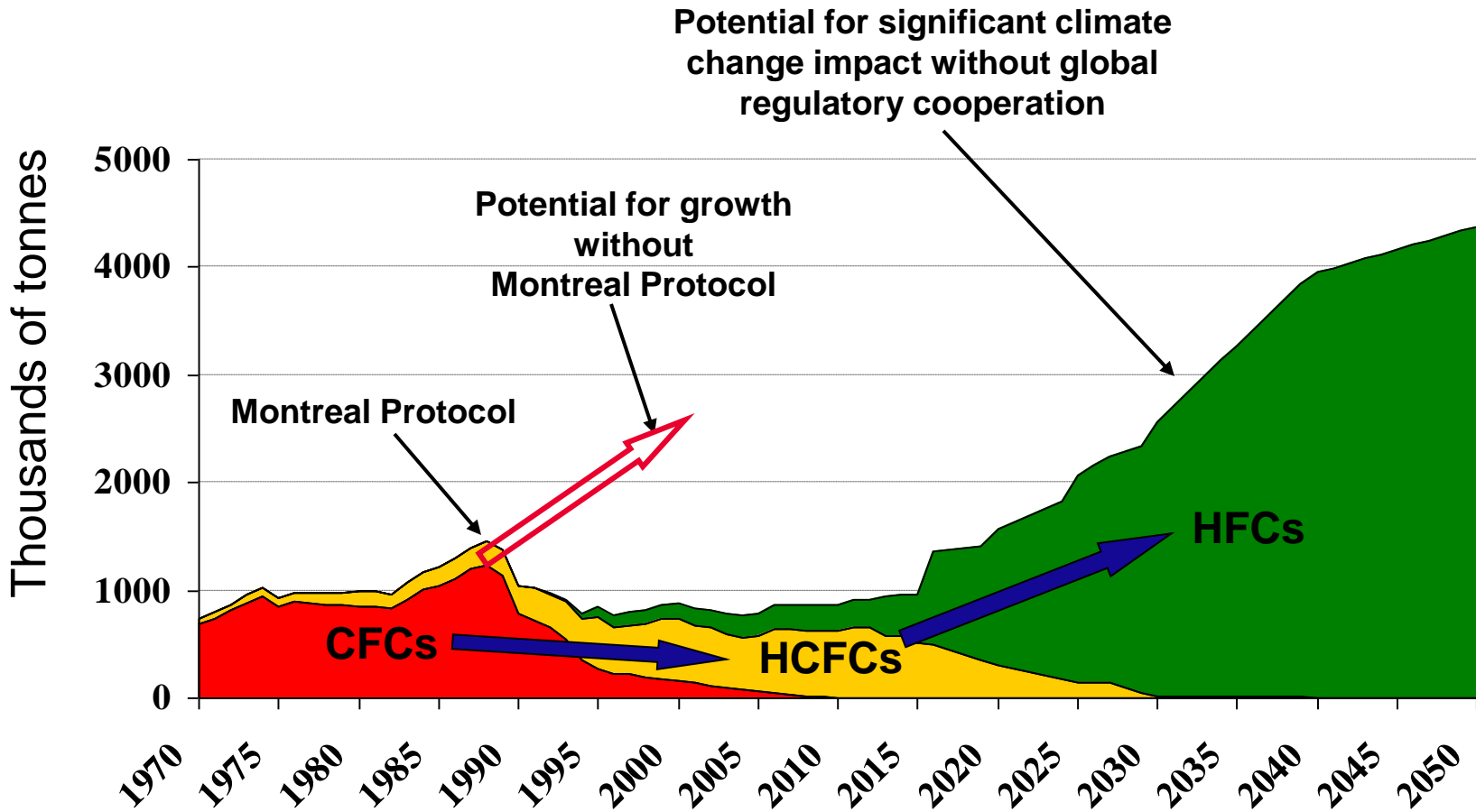
Meeting of the Technology and Finance Standing Committee

7 Feb 2013

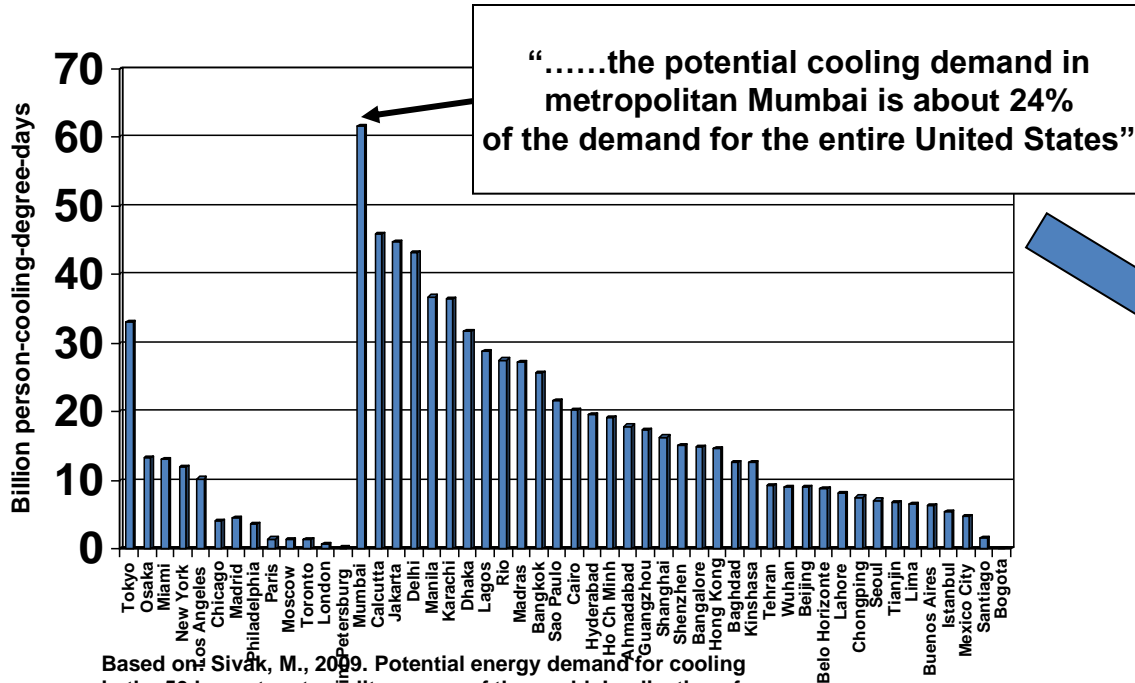
# Topics

- **Challenges of meeting the HCFC phaseout schedule**
  - **A projection of demand vs Montreal Protocol limits**
  - **Contributing factors**
- **Projections of climate implications of business as usual use of HFCs as substitutes**
- **HFC Control under the Montreal Protocol: Comments and Discussion**

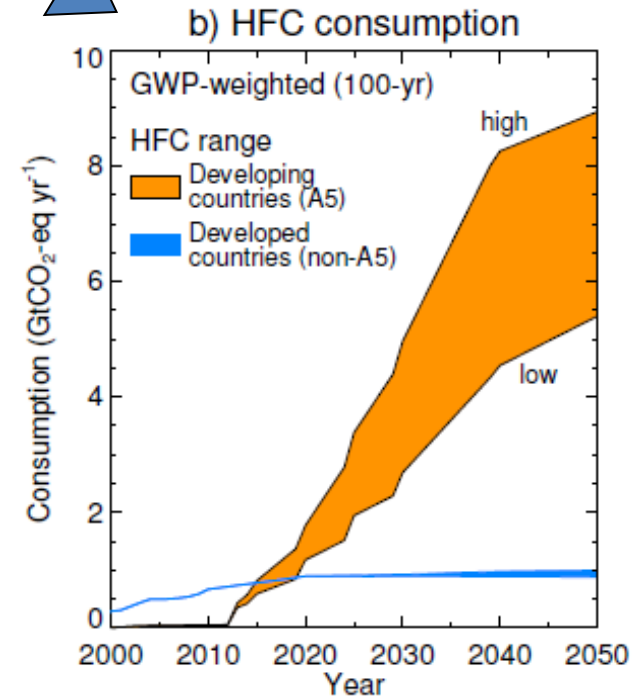
# Sustainability Challenge: Global Fluorochemical Consumption



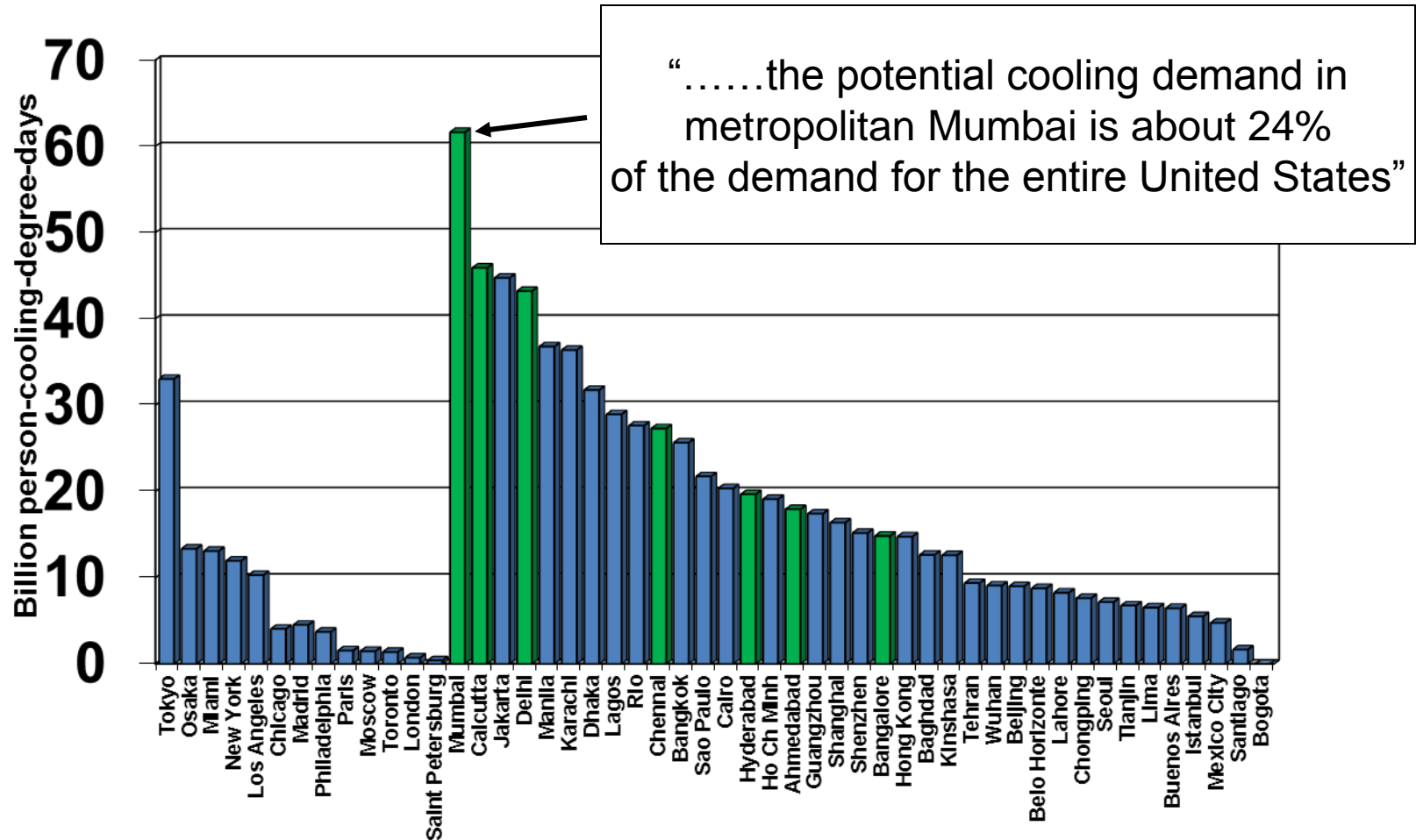
# Growing Demand for Products Currently Using HFCs/HCFCs



Based on Sivak, M., 2009. Potential energy demand for cooling in the 50 largest metropolitan areas of the world: Implications for developing countries. Energy Policy 3, 1382-1384.



# Potential for Very Large Growth for Air Conditioning and Refrigeration in India

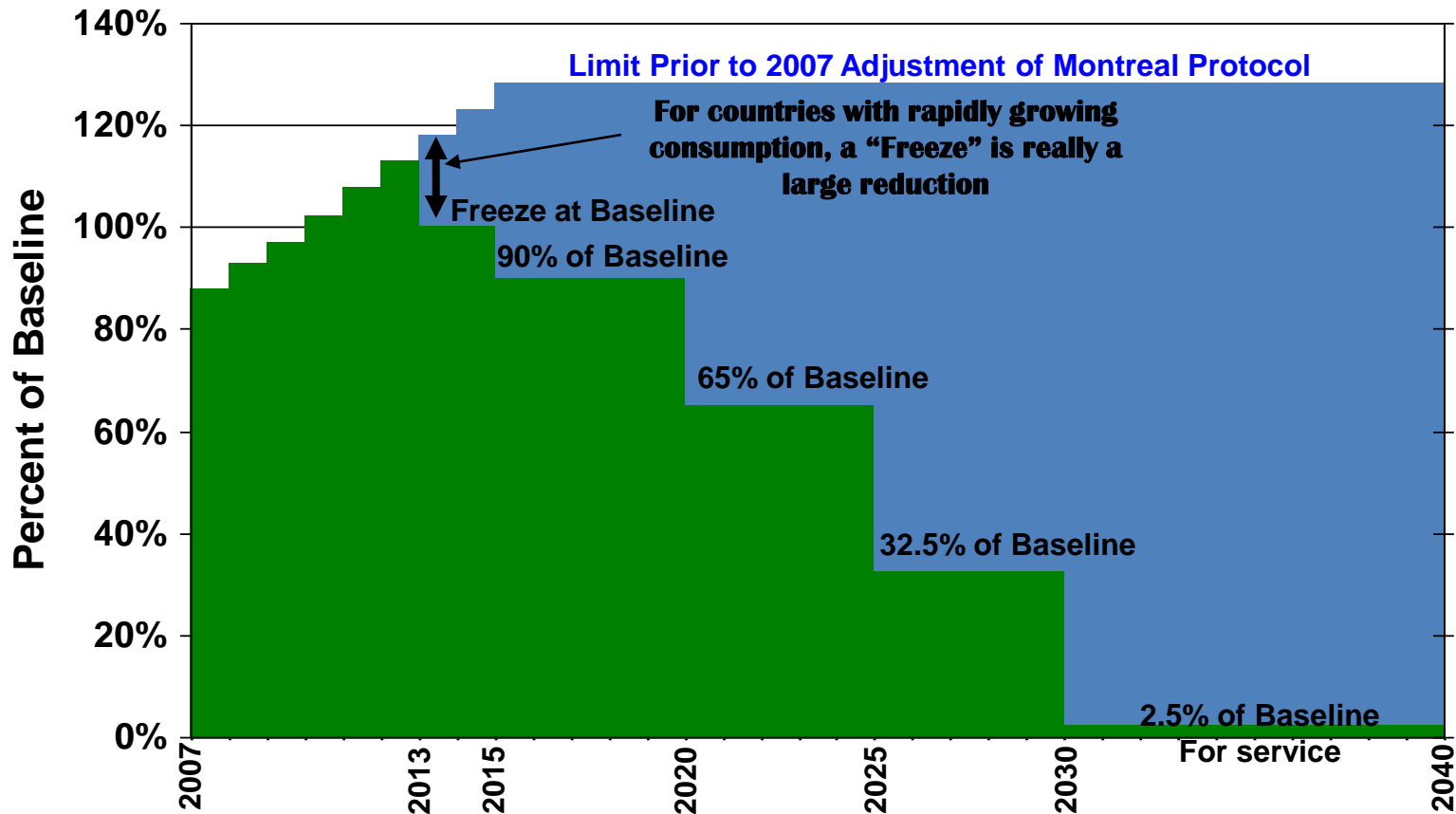


Based on: Sivak, M., 2009. Potential energy demand for cooling in the 50 largest metropolitan areas of the world: Implications for developing countries. Energy Policy 3, 1382-1384.

# Challenges in Meeting Montreal Protocol HCFC Limits

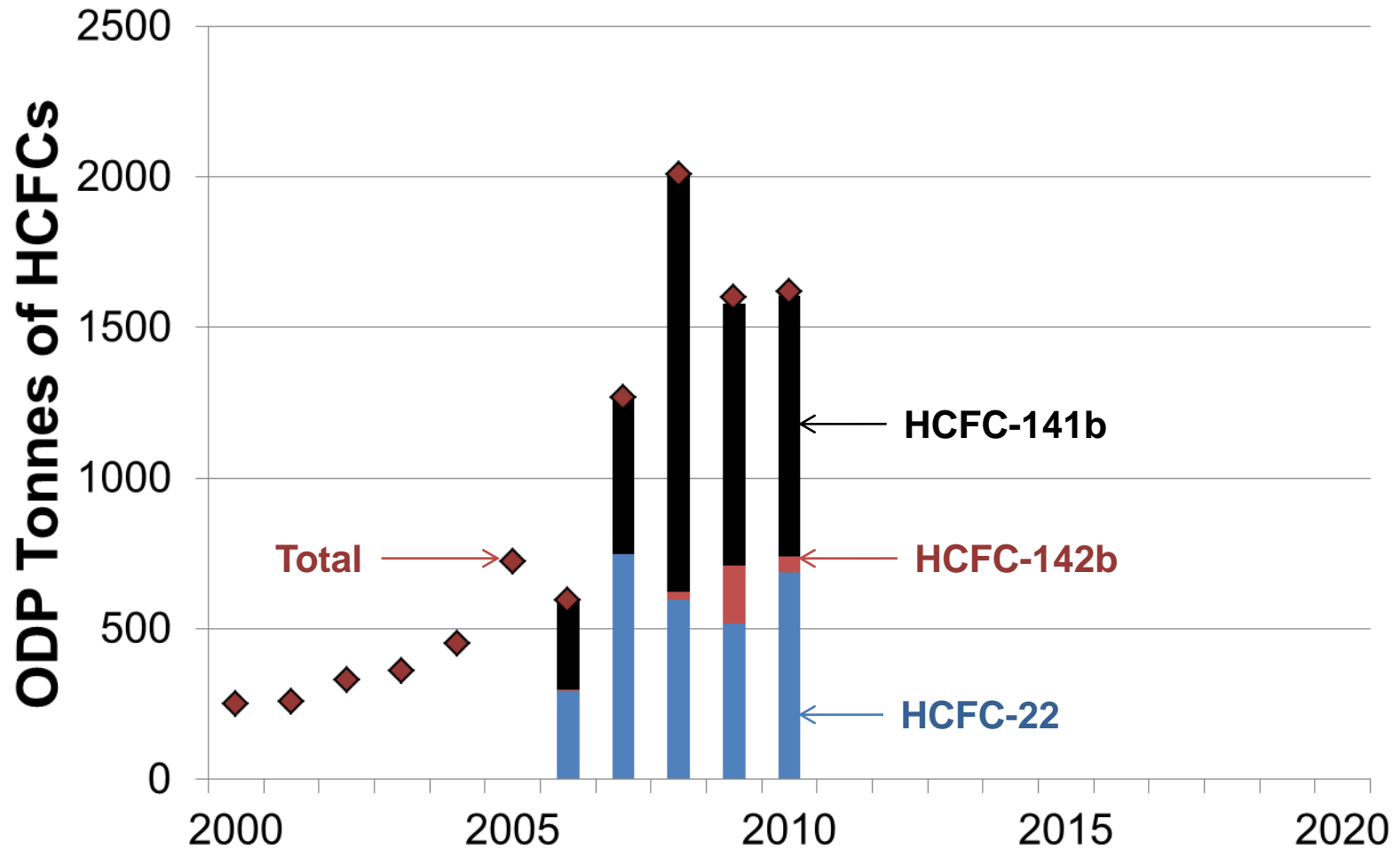
# Montreal Protocol HCFC Limits for Article 5 (Developing) Countries

## HCFC Consumption Limits



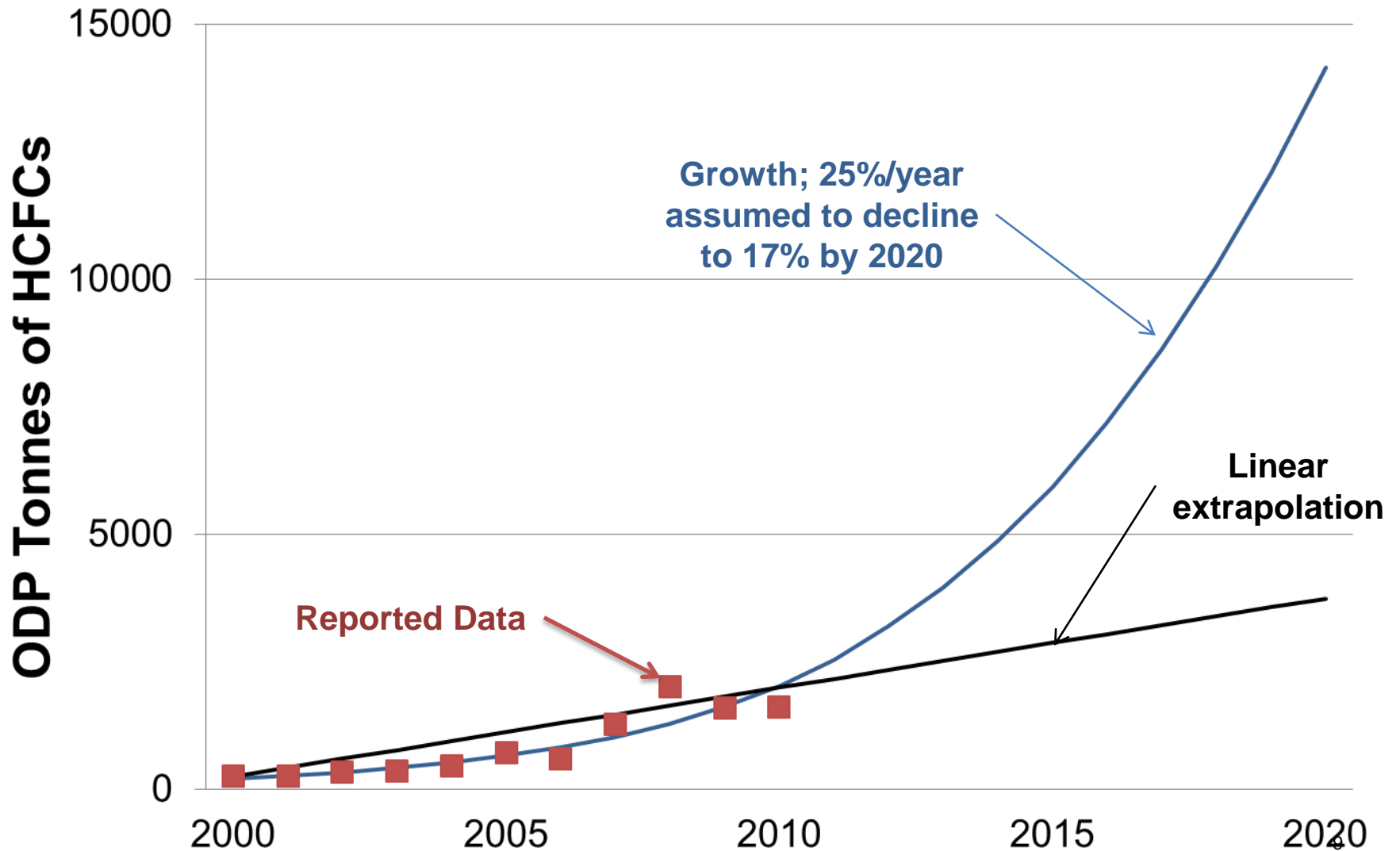
Baseline = average ODP weighted 2009, 2010 HCFC consumption

# HCFC Data Reported to UNEP and in HPMP

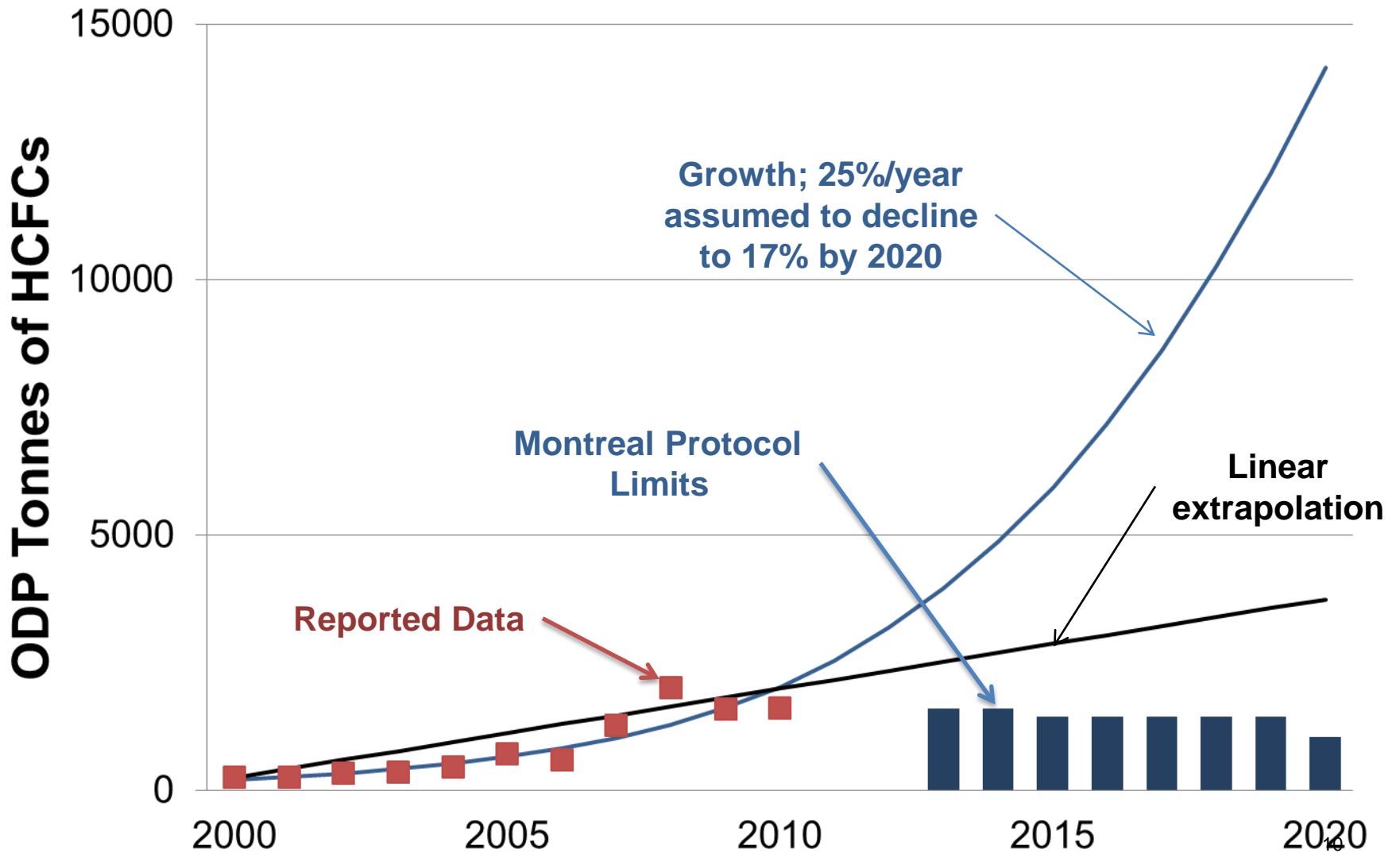




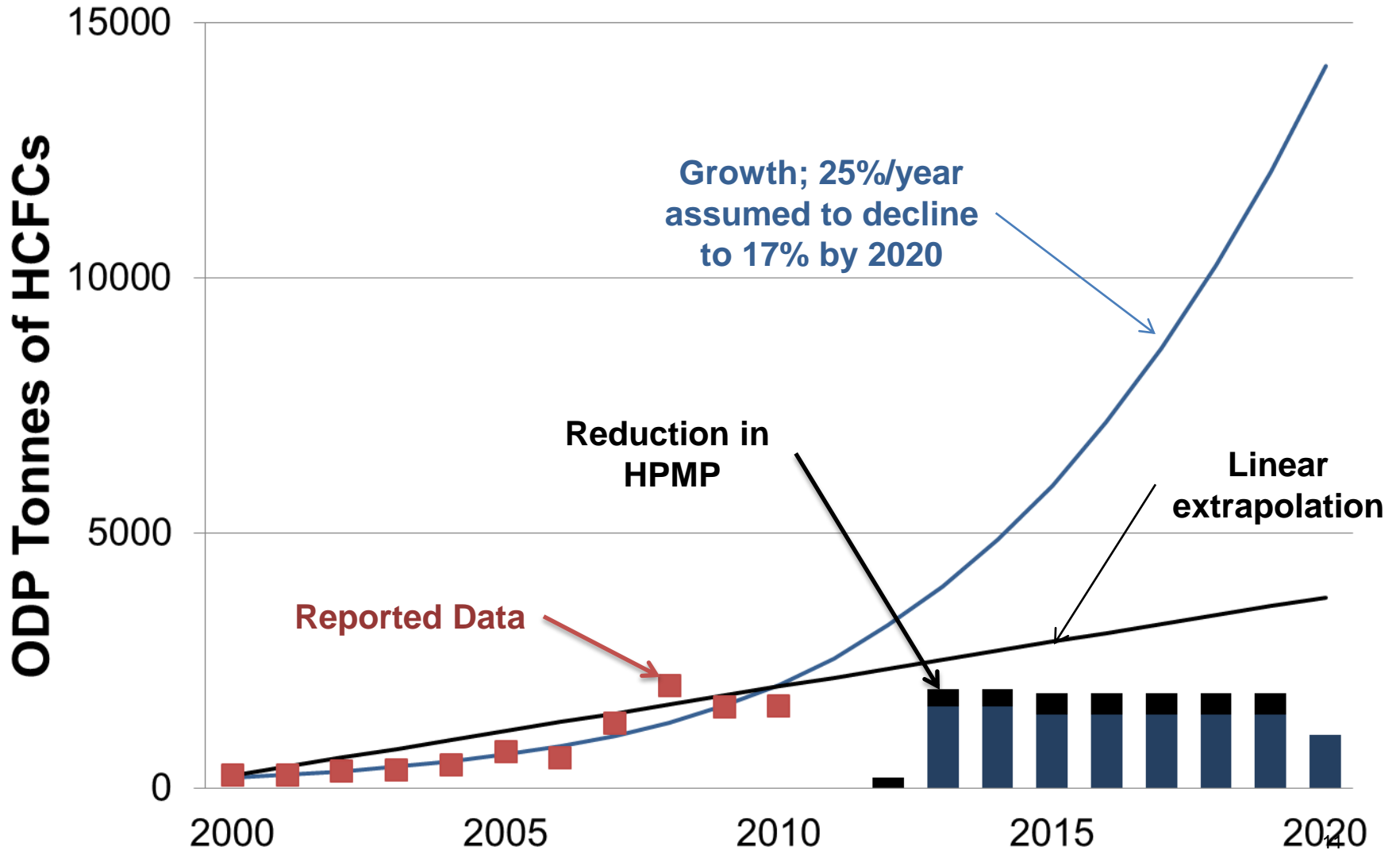
# Projected HCFC Demand Assuming no Controls



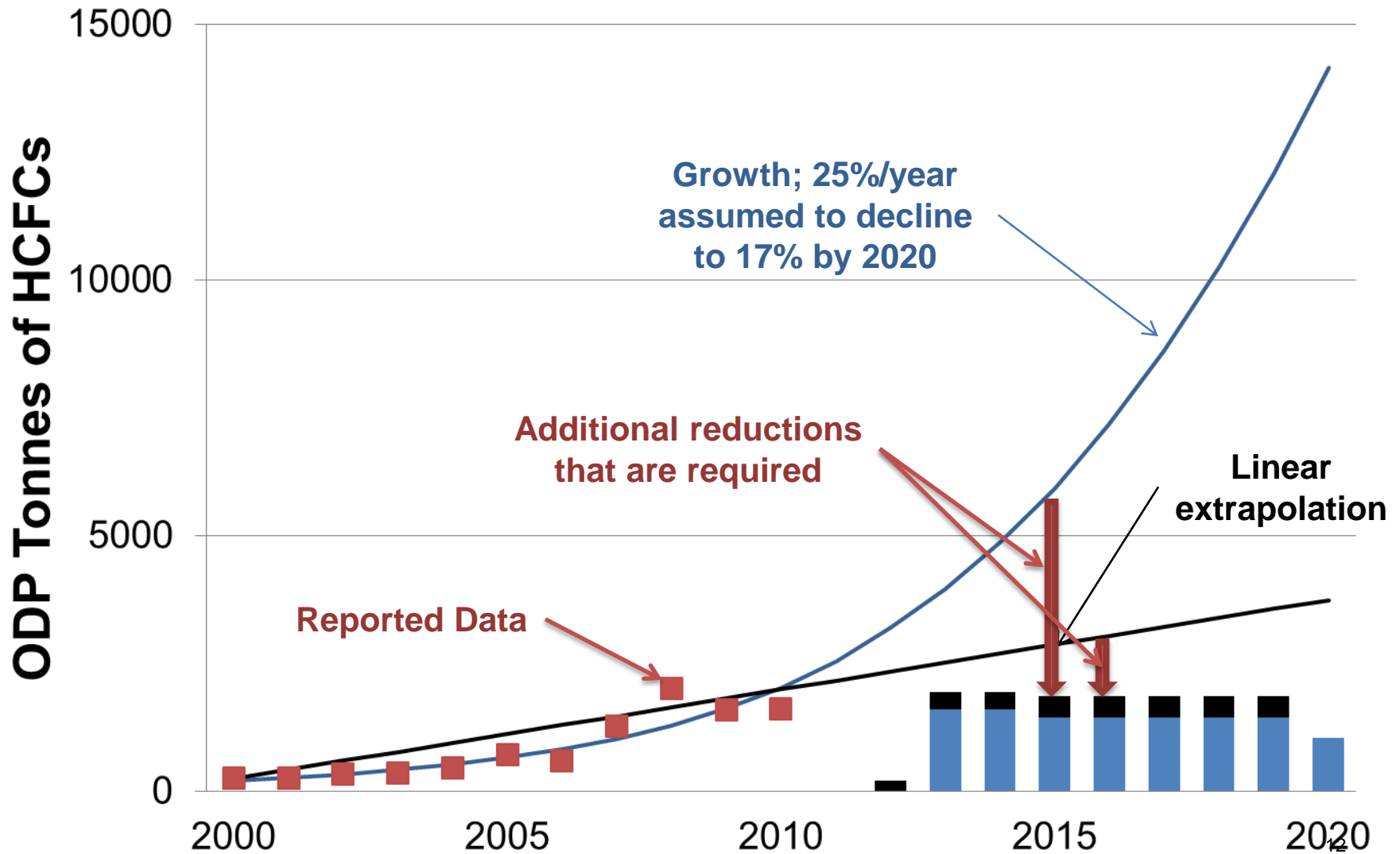
# Projected HCFC Demand Exceeds MP Limits



# Projected HCFC Demand Exceeds MP Limits Even with HPMP Reductions Included



# Additional Reductions Required to Meet MP



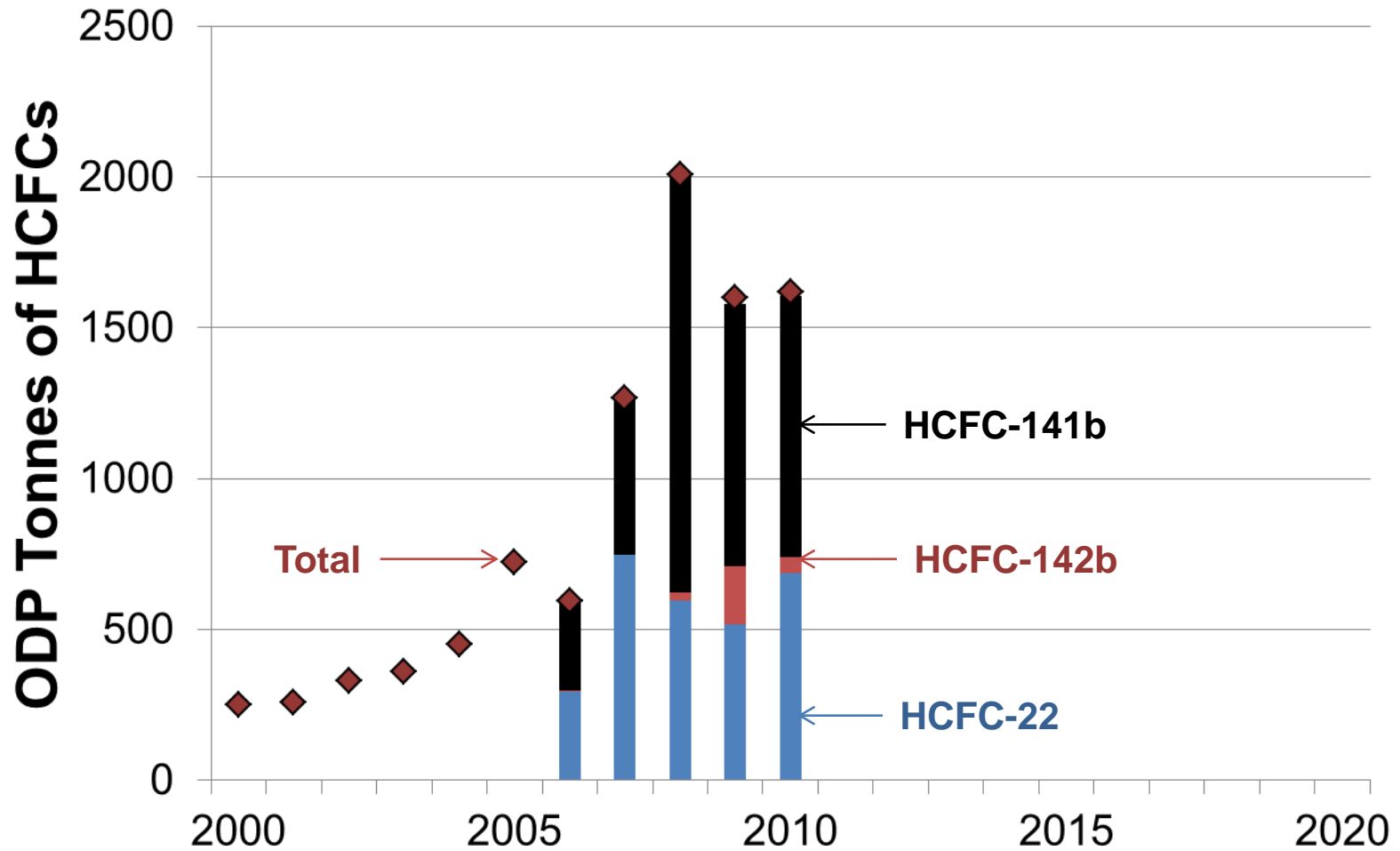
# Contributing Factors

## **Factors contributing to difficulty in meeting commitments**

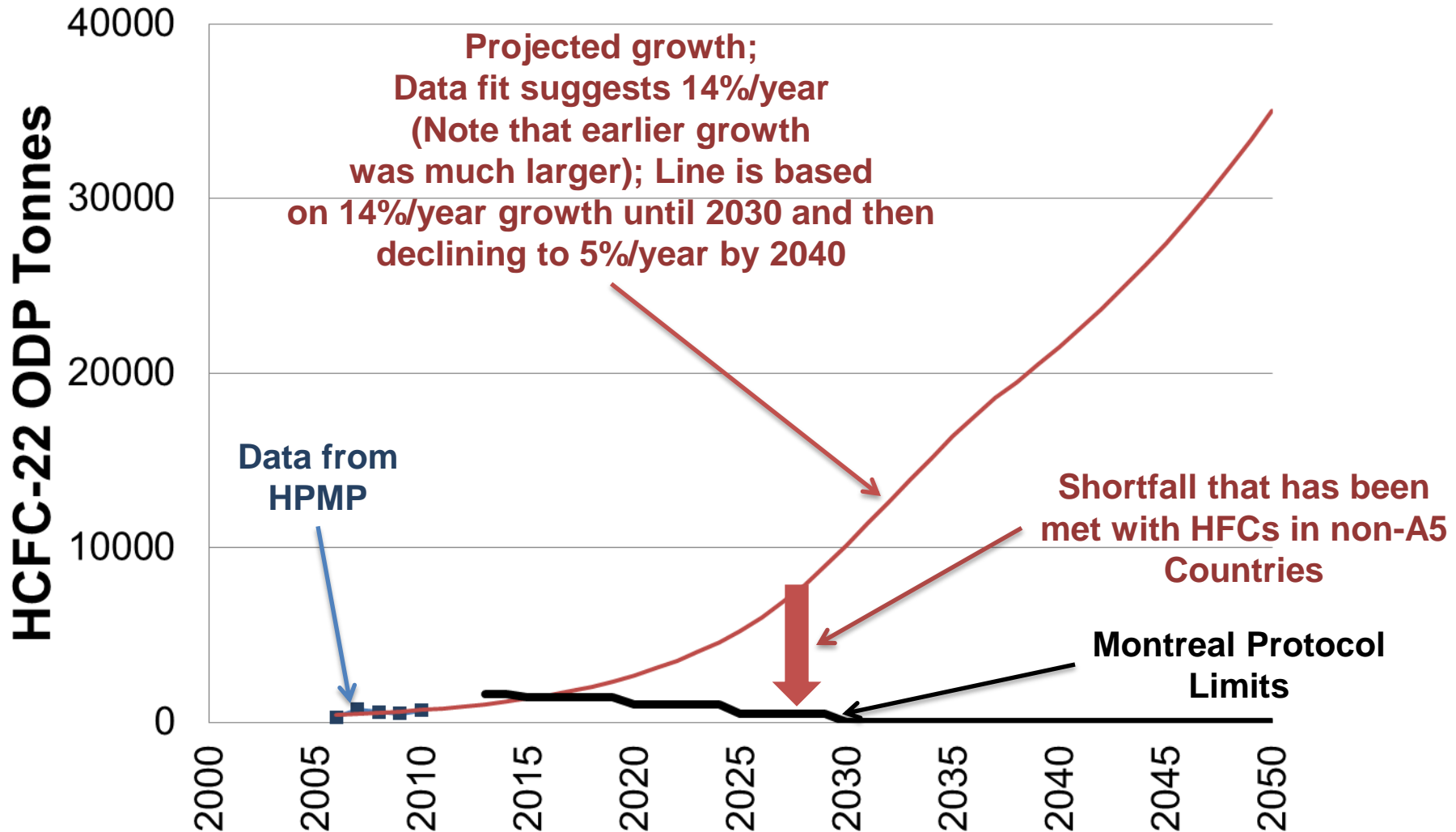
- **An historical baseline in a rapidly growing market**
- **A very short planning horizon**

# Projections of HFC Demand

# HCFC Data Reported to UNEP and in HPMP

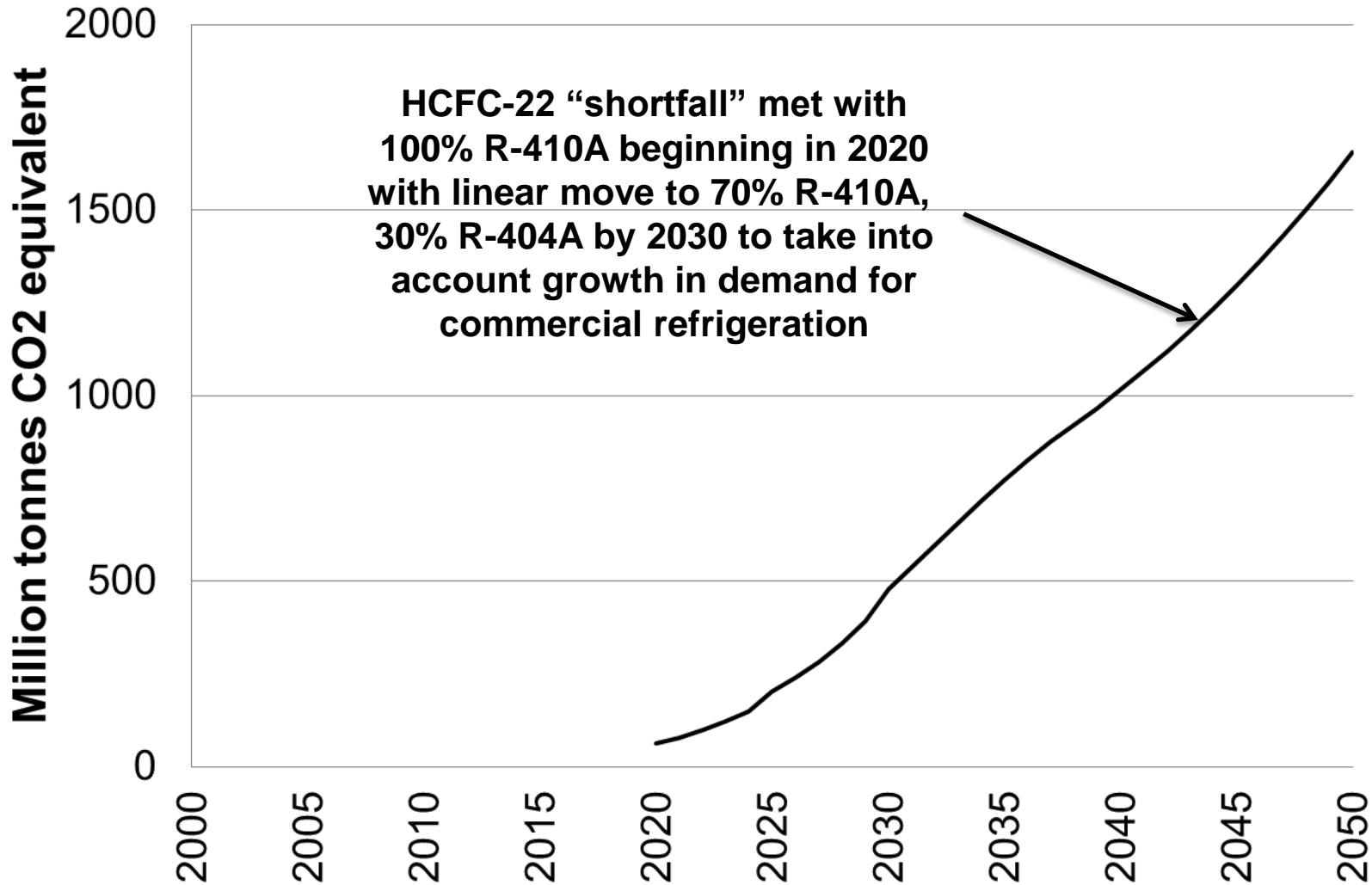


# Potential Implications of Growth in Demand for Services now met with HCFC-22

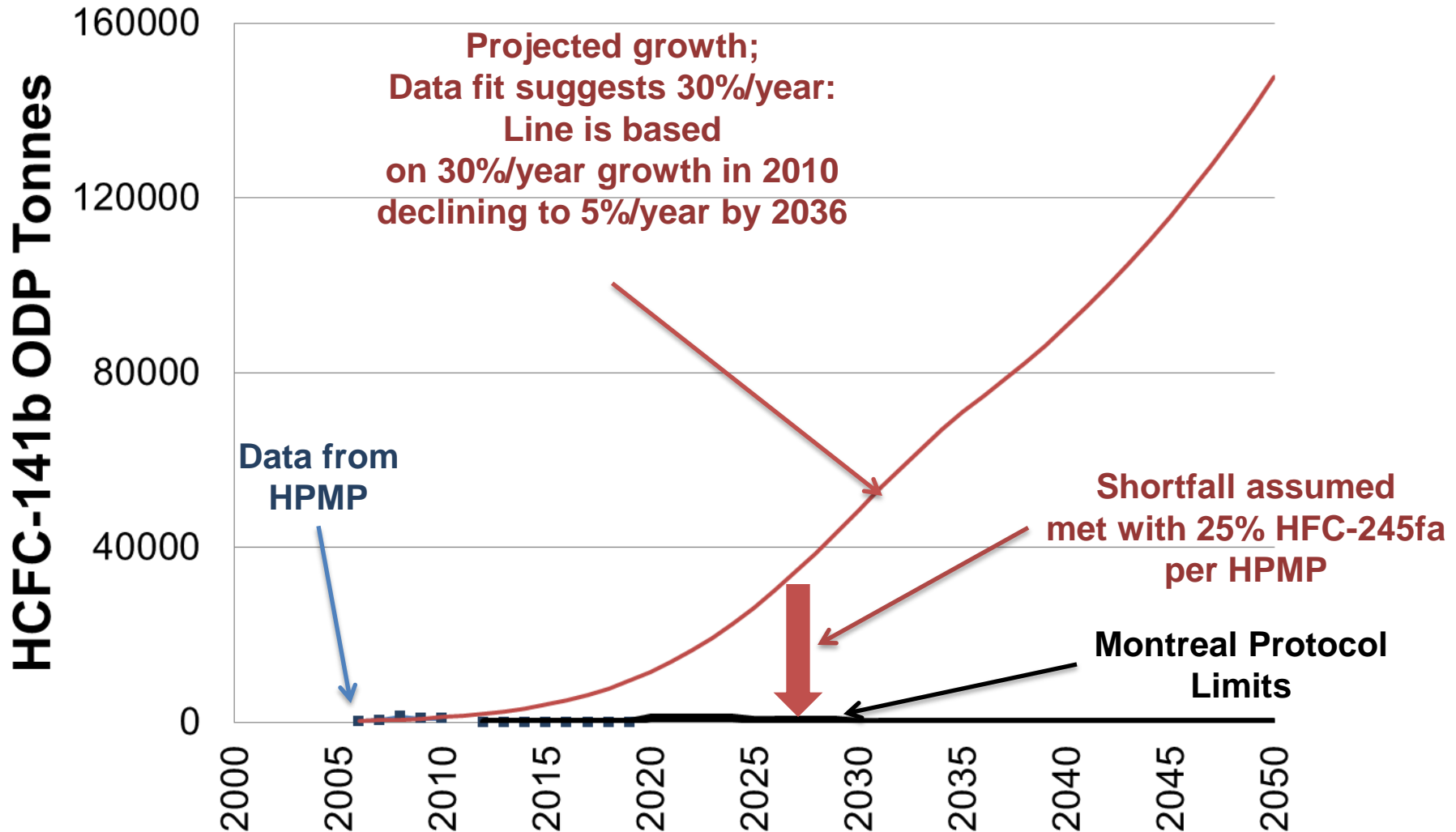




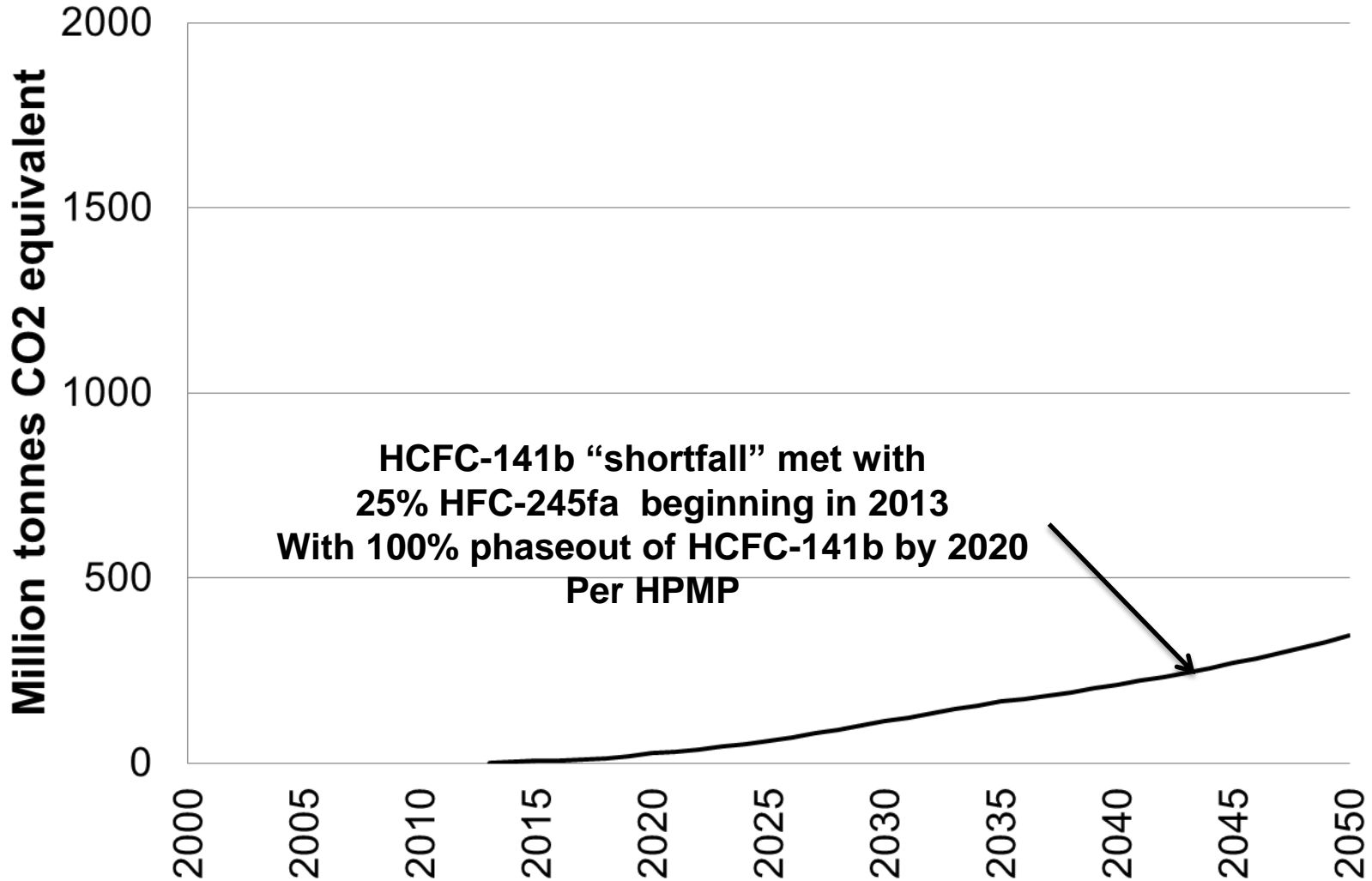
# Global Warming Implications (CO2 equivalents) of Following non-A5 Parties HCFC Substitution Patterns



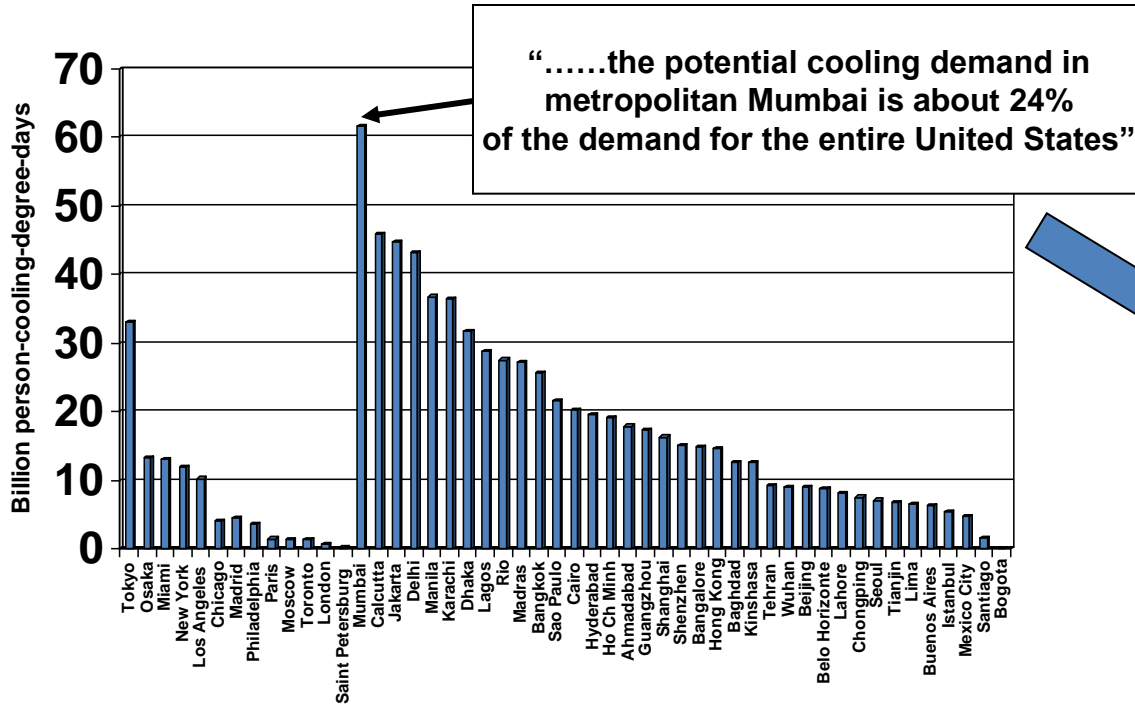
# Potential Implications of Growth in Demand for Services now met with HCFC-141b



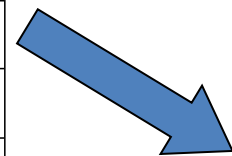
# Global Warming Implications (CO2 equivalents) of Following HPMP



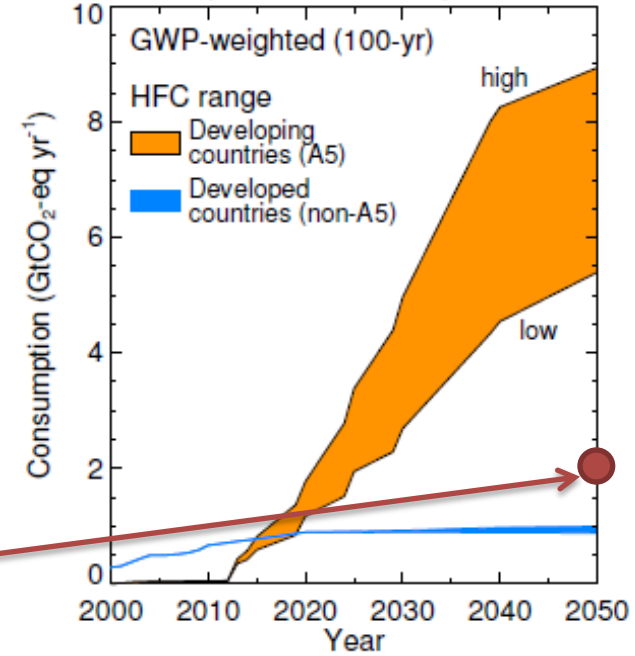
# Growing Demand for Products Currently Using HFCs/HCFCs



Based on: Sivak, M., 2009. Potential energy demand for cooling in the 50 largest metropolitan areas of the world: Implications for developing countries. Energy Policy 3, 1382-1384.

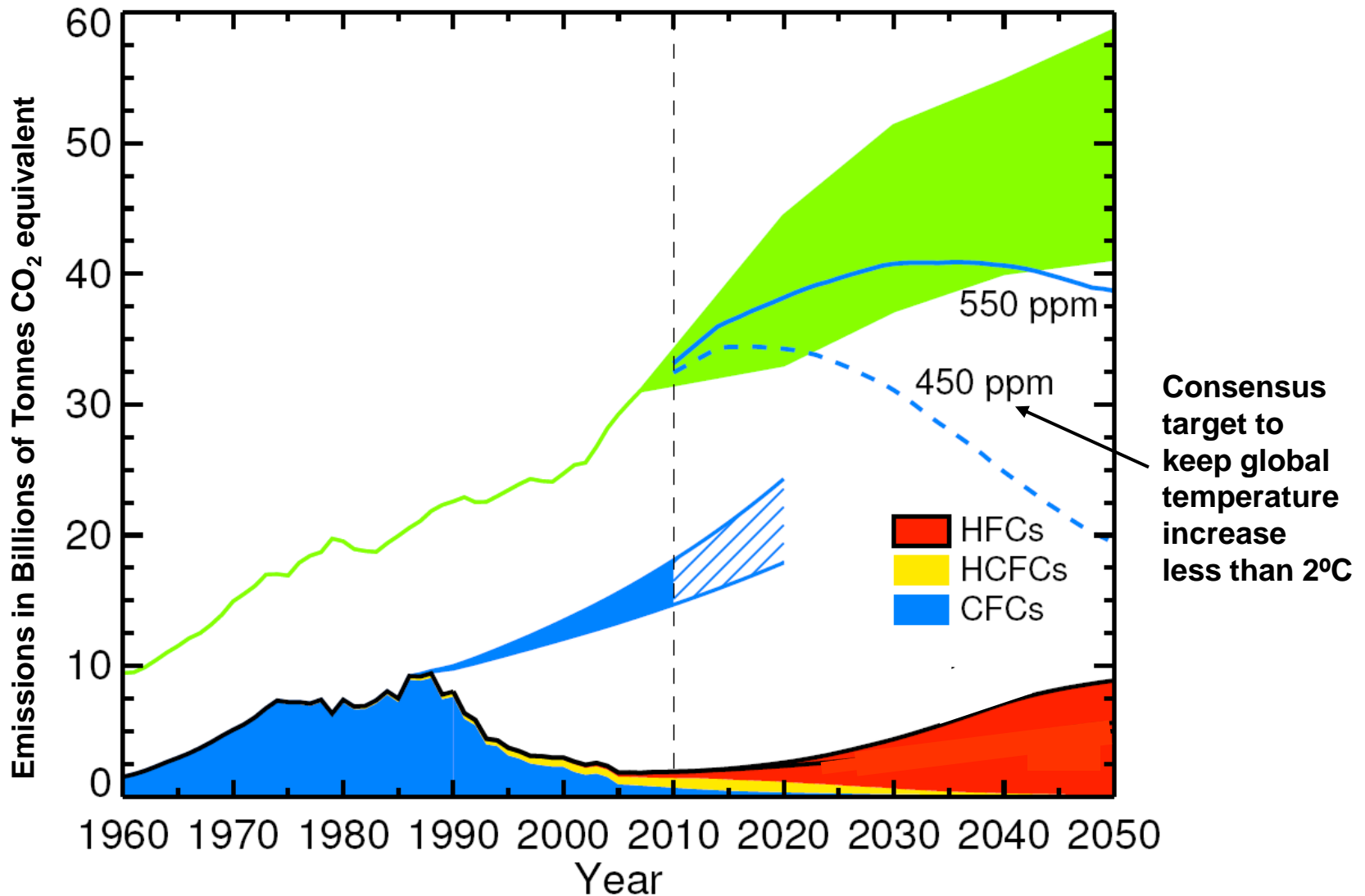


b) HFC consumption



**Projected demand for HCFC-22 and HCFC-141b  
Alternatives in India;  
Does not account for growth in use of HFC-134a!**

# Sustainability Challenge: Global Fluorochemical Consumption



Adapted From: Velders Guus J. M., David W. Fahey, John S. Daniel, Mack McFarland, and Stephen O. Andersen, *The large contribution of projected HFC emissions to future climate forcing*; Proceedings of the National Academy of Sciences, published online July 7, 2009.

# HFC Control under the Montreal Protocol Comments and Discussion

# Why An HFC Amendment to the Montreal Protocol?

- **HFCs are different from most Kyoto gases – intentionally produced for use in valued applications**
  - Lack of coordination of ODS phaseout and HFC controls likely to create problems
- **MP is a well functioning 24 year old agreement**
- **MP has set precedent for cooperation between A5 and non-A5 countries**
  - Multilateral Fund provides assistance for A5 countries
- **HFCs are being used to replace ODSs being phased out under the MP**
  - Coordination of HFC controls and ODS phaseout necessary to avoid interference
  - MP has the expertise, experience and supporting panels necessary to effectively control HFCs

# Potential Advantages of MP Structure to India

- **Control schedule**
  - **Baselines set differently for non-A5 and A5**
  - **Reduction schedules set differently for non-A5 and A5**
  - **A delay in implementation between non-A5 and A5**
- **Assistance for transition; the Multilateral Fund**



# Current HFC regulatory situation

- **Proposals to amend the Montreal Protocol to cap and reduce HFC consumption**
  - Proposals similar to those submitted over last four years will probably be put forward this year
  - Proposals generally supported by wide range of stakeholders including
    - Many countries
    - Industry
    - Environmental organizations
  
- **Several developed countries already have regulations affecting HFCs – diversity and form of regulations a concern**
  - Europe and Japan implementing HFC controls
    - GWP limit for mobile air conditioning in Europe; Japan likely to conform
    - Cap and reduction on GWP basis likely beginning in 2015
  - Carbon tax in Australia
  - U.S. taking action
    - Incentive program to use low GWP refrigerant for mobile air conditioning
    - Petitions to remove HFC-134a from list of approved alternatives
    - Potential for continued action by states

# Key Elements of Proposed HFC Amendments

- **A cap and reduction of HFCs on a GWP-weighted basis**
  - A reduction (or phase down), not a phase out
  - Does not specify which HFCs can be used
  
- **Recognizes that HCFC phase out is ongoing**
  - HCFCs included in baseline on a GWP-weighted basis
  - **Timing should not compromise ability to meet HCFC phase-out schedules**
  
- **Does not impact HFCs inclusion in UNFCCC**
  - Compliments UNFCCC emissions controls
  - Does not effect existing HFC-23 CDM projects
  - Could allow CDM projects for elimination of HFC applications
  
- **Proposals allow for negotiation of key elements**
  - Baseline
  - Delay between non-A5 and A5 implementation
  - Rate of decline
  - Multilateral Fund

# Conclusions/Observations

- **Agreement on HCFC phaseout acceleration is encouraging signal that all countries are continuing to work together for environmental benefit**
- **HFCs are an important part of the solution to allow HCFC goals to be met – HFCs already used extensively in developed countries**
- **Momentum will continue to build for actions to address global climate change**
- **Pressure to address potential for HFC growth will continue to build**
- **An amendment to the Montreal Protocol to cap and reduce HFCs provides a unique opportunity for global cooperation**

# What Would India Want as Part of Amendment?

- **Elements of the schedule**
  - **How the baseline is set**
  - **The phase down schedule**
  - **The delay in implementation**
- **Funding assistance**
- **How HFC-23 is managed**
- **Relief in HCFC schedule?**

## **Should India Have Their Own Proposal?**

# Discussion