



The Alliance
for Responsible Atmospheric Policy

HFCs and Climate Policy

Presented by

Kevin Fay

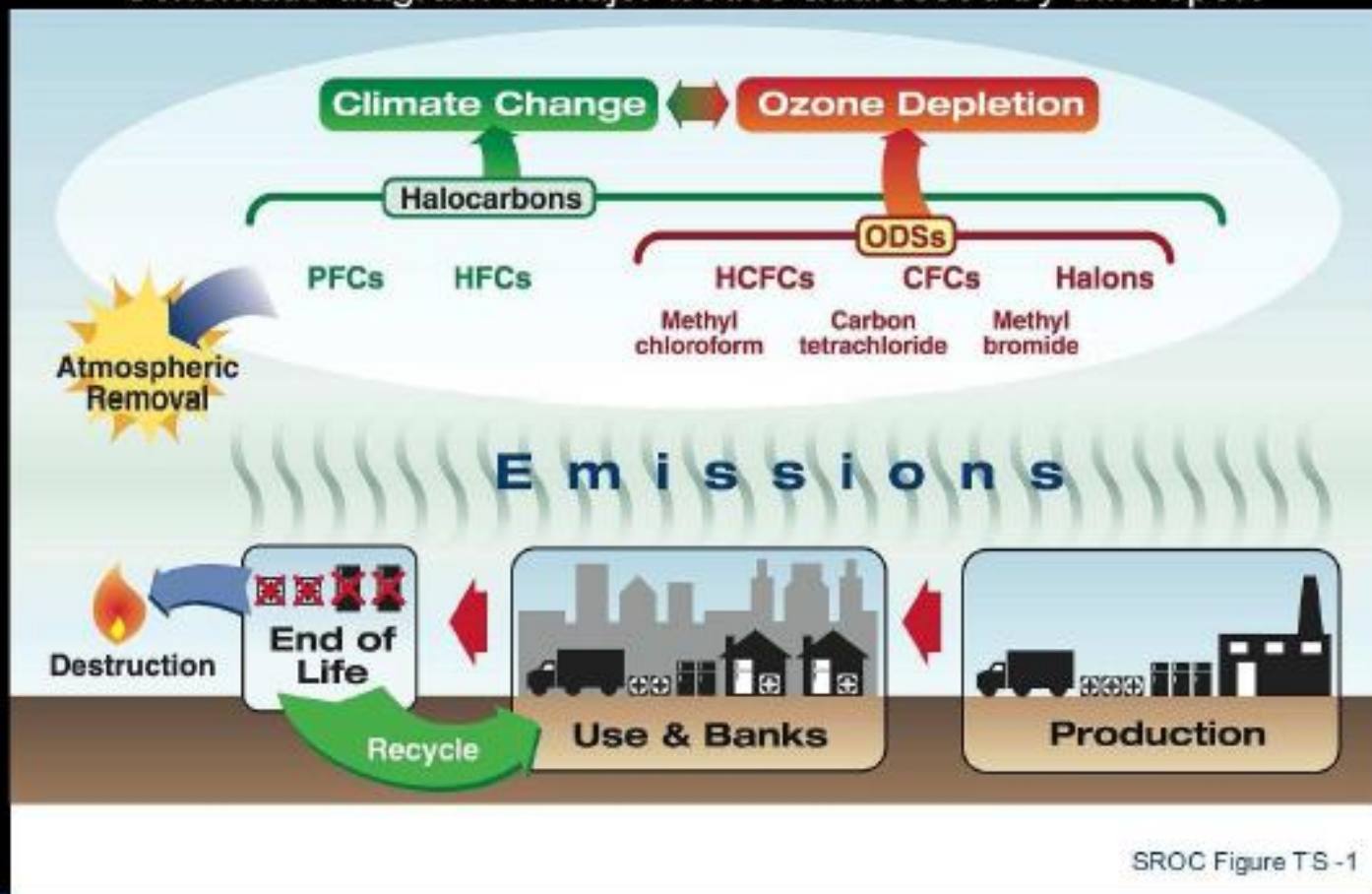
The Alliance for Responsible Atmospheric Policy`

October 2009

Environmental Protection Issues with Fluorocarbon Technologies

- Technologies Important for Safety, Health & Well-Being
 - Air Conditioning and Refrigeration
 - Foam Insulation
 - Fire Protection Systems
 - Solvents
 - Aerosol
- Energy Efficiency A Critical Component

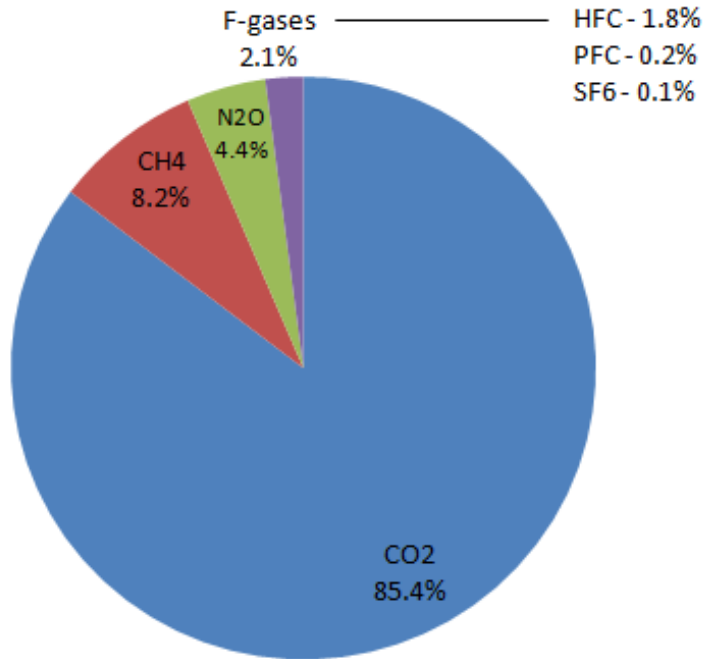
Schematic diagram of major issues addressed by this report



Early Recognition of Fluorocarbons as Greenhouse Gas Contributor

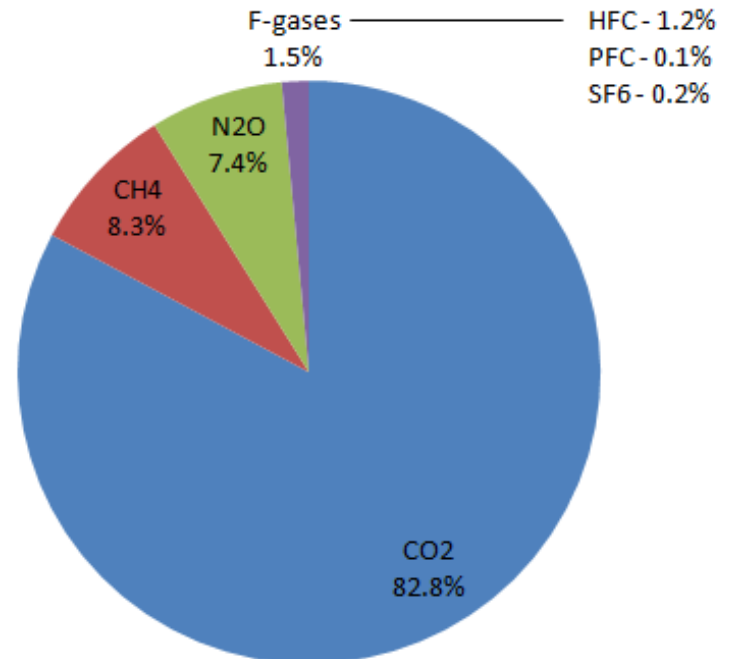
- Early support for inclusion of HFCs in basket of gases in Kyoto Protocol
- Fluorocarbons are a relatively small percentage of direct overall greenhouse gas emissions
- Indirect emissions of fluorocarbon-dependent technologies 4-5 times greater than direct GWP emissions

2007 US Emissions



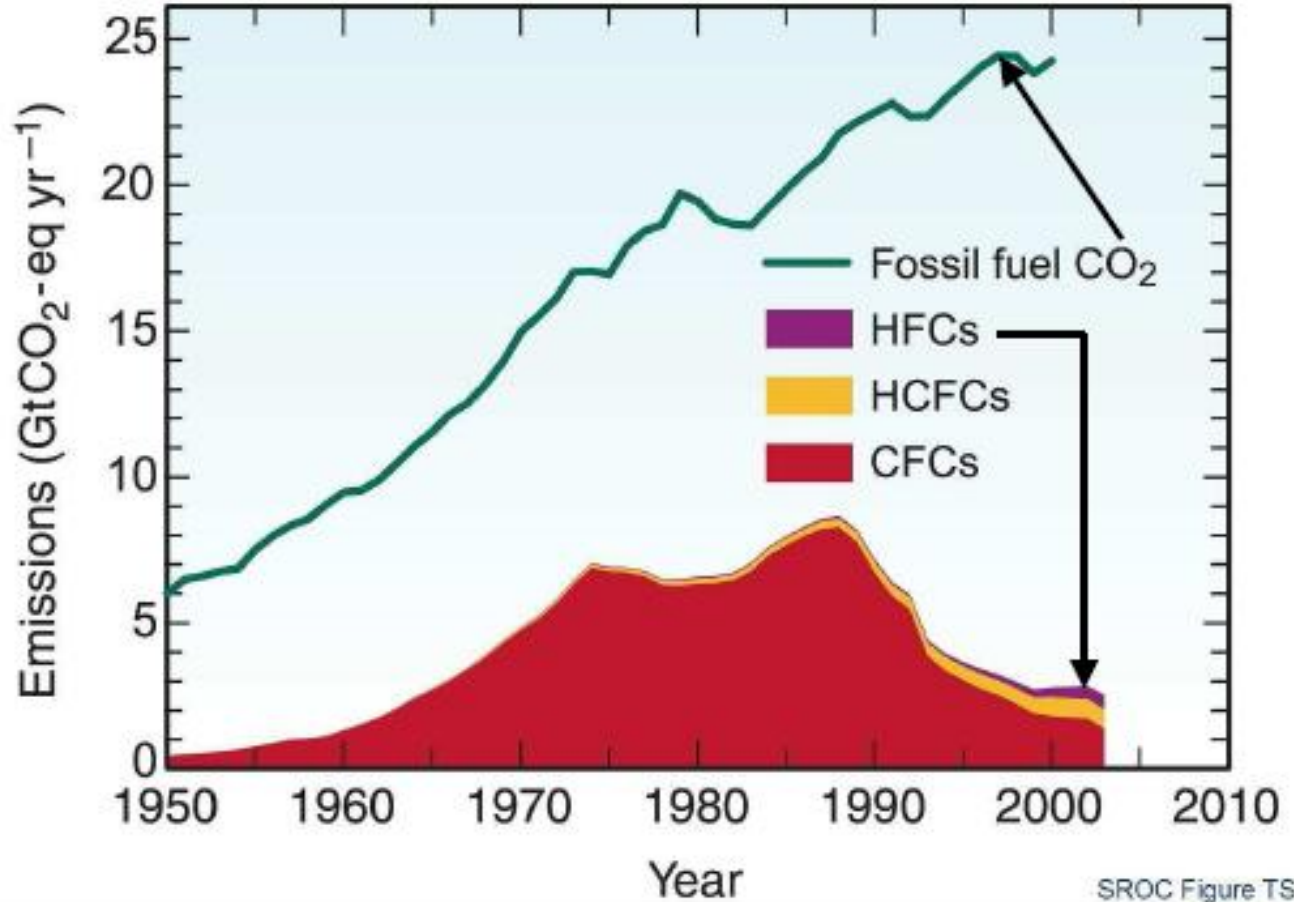
Source: 2009 U.S. Greenhouse Gas Inventory Report, USEPA

2007 EU Emissions



Source: Annual European Community Greenhouse Gas Inventory 1990-2007, EEA

Direct GWP-weighted emissions

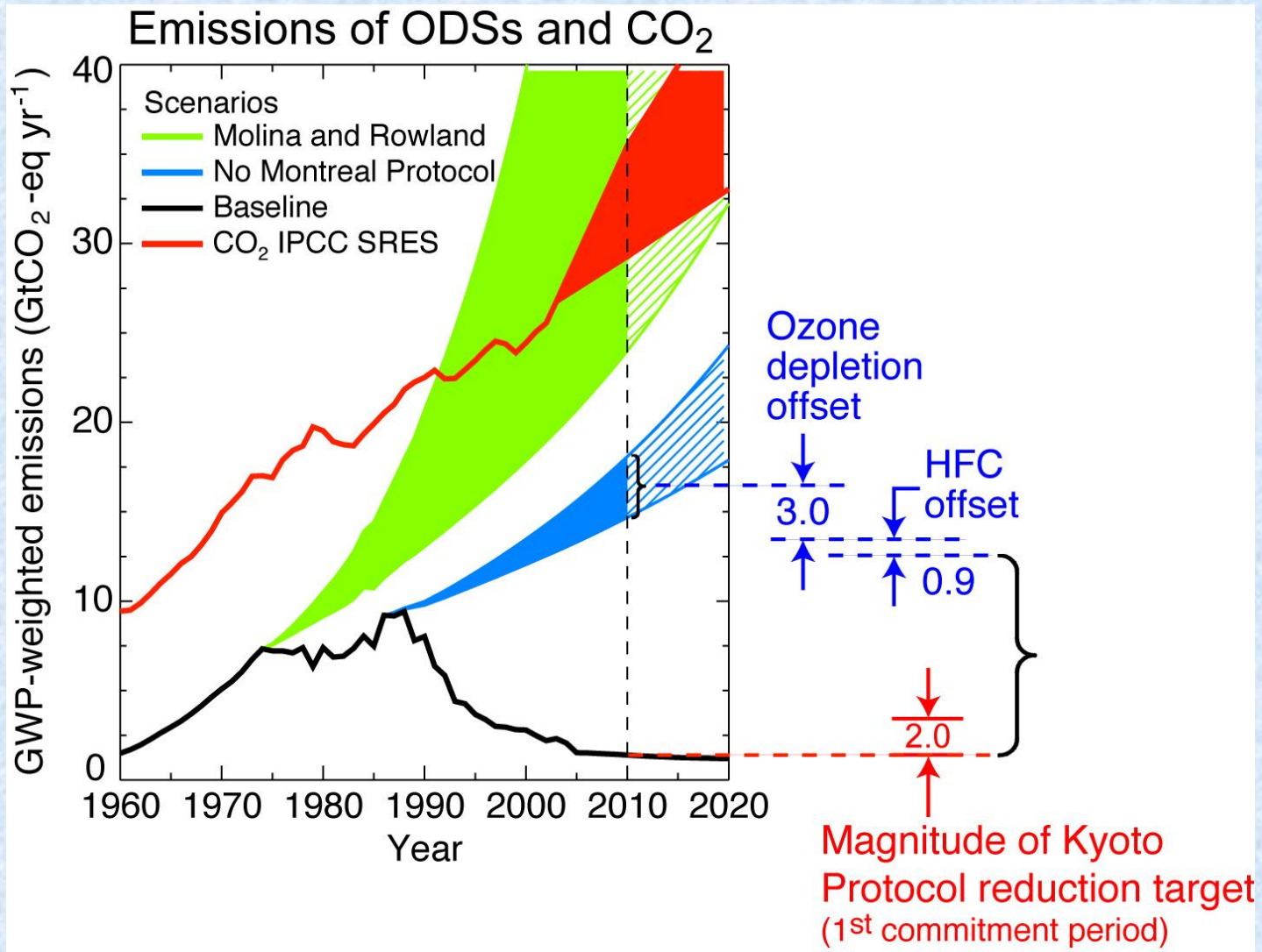


SROC Figure TS -9

IPCC

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE





From: Velders Guus J. M., Stephen O. Andersen, John S. Daniel, David W. Fahey, and Mack McFarland, *The importance of the Montreal Protocol in protecting climate*; Proceedings of the National Academy of Sciences, published online Mar 8, 2007.

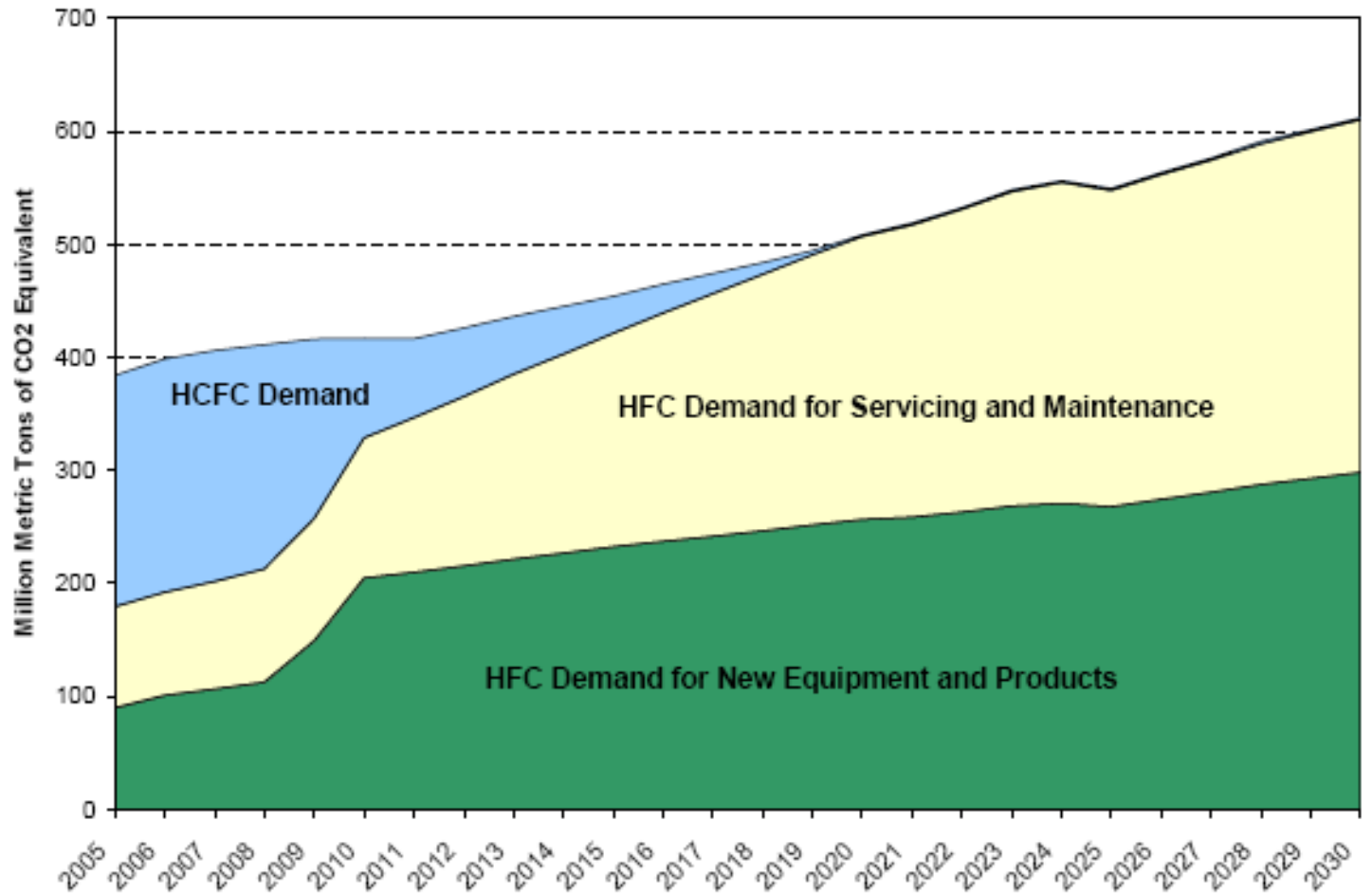
Early HFC Climate Policy Coverage Inconsistent

- Early climate policy inconsistent over coverage of HFCs
 - CFCs + HCFCs excluded from UNFCCC; HFCs included in Kyoto basket of gases
 - Not included in European ETS
 - First CDM project approved was for HFC-23 destruction from HCFC-22 byproduct waste stream
 - European F-gas regulation focuses on emission reductions and management
 - Japan pursues voluntary approach
 - Australia proposes HFC fee, and cap and trade systems as part of overall program
 - CARB analysts specify HFC initiatives on aerosols, auto refrigerant, other uses

Emerging Policy Concerns

- Original industry focus was to allow energy efficiency gains to be used to offset HFC contribution – but policy process struggled to maintain linkage
- Concern that high GWP gas CO₂e tons could undermine cap and trade system
- Developing countries seeking windfalls on HFC-23 emissions

Figure 4. HCFC and HFC Demand under the Business-as-Usual Baseline

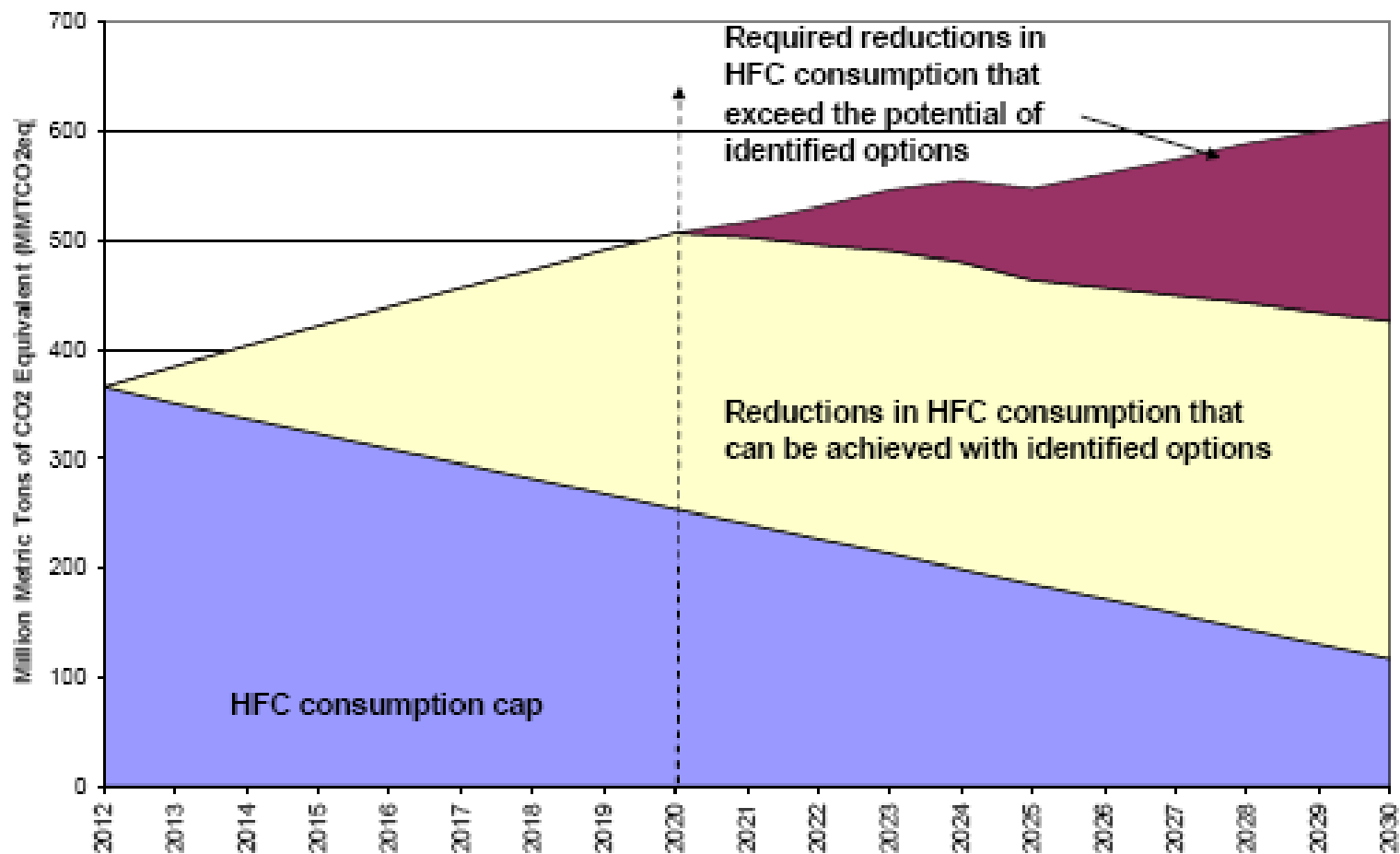


Note: The average annual growth rate in total HFC consumption from 2011 through 2030 is 3%; for servicing and maintenance, the average growth rate is 5%; and for new equipment and products, the average growth rate is 2%.

Industry Considers HFC Policy Options

- HFCs are better treated separately from carbon basket
- Important to minimize market disruption and to encourage development and introduction of substitutes
- Need to implement more effective refrigerant management initiatives
- Destruction credits should be achieved for HFC predecessors: CFCs, HCFCs

Figure 9: Scenario 2 HFC Cap and Reductions



Note: After 2020 (dotted line), MACs have not been explicitly derived; after this time, it is expected that additional alternative substances and technologies would be developed that are not currently included in the MACs.

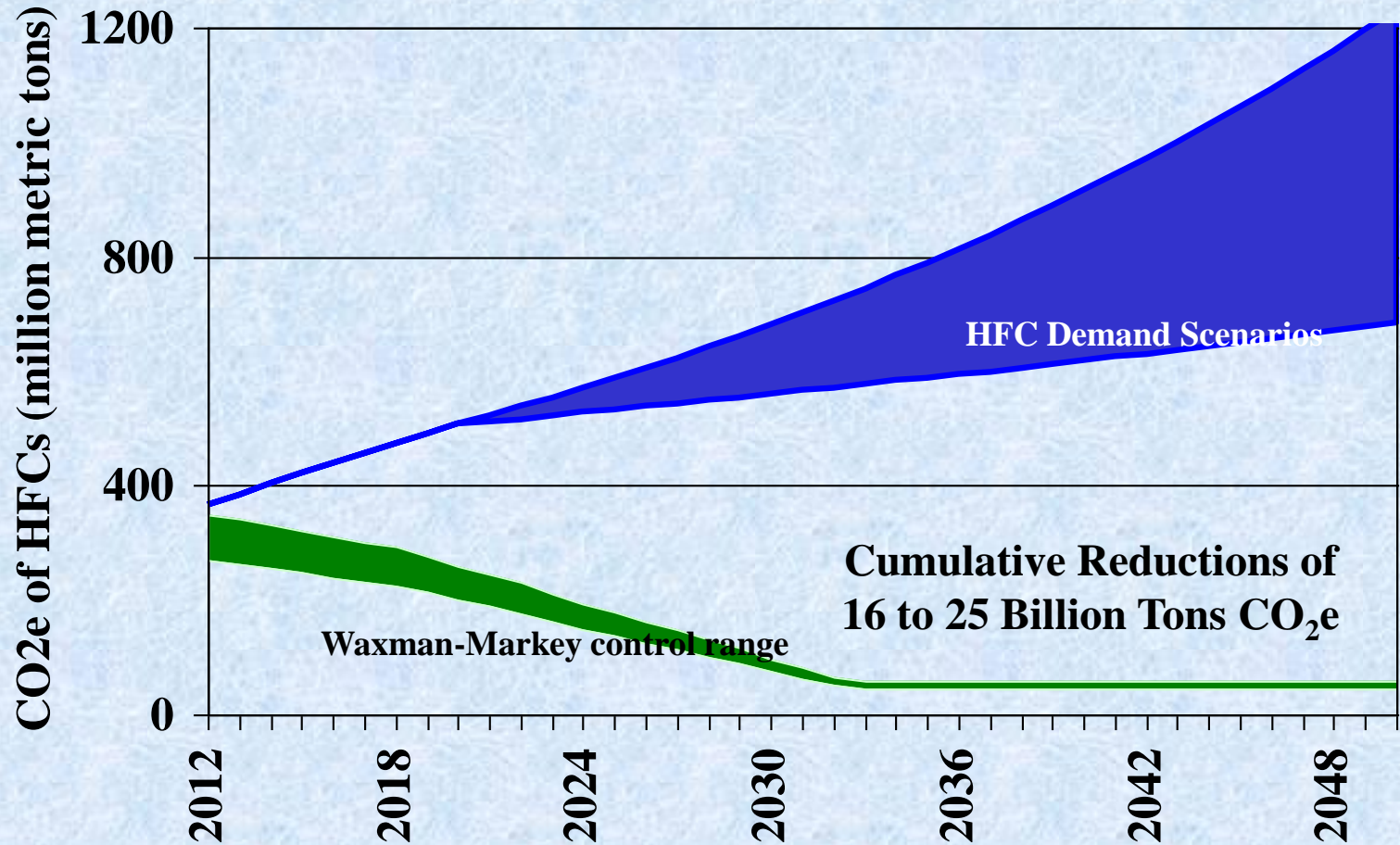
Congressional Consideration

- 2007-2008 – Senate includes separate HFC title in Lieberman-Warner legislation, and Boxer-Lieberman-Warner bill reported out of Senate EPW Committee
- 2008 – House Energy & Commerce Committee proposes separate HFC title as part of Dingell-Boucher discussion draft

Congressional Consideration

- 2009 – House passes H.R. 2454, with separate section on HFC reductions supported by industry and environment NGOs
 - Relies on Clean Air Act Title VI structure
 - 33% reduction from 2005 levels by 2020
 - 85% reduction from 2005 levels by 2033
 - HFC cap and trade system, 8% auction in first year increasing to 72% auction in year nine
 - Participants limited to HFC chain of commerce
 - Provides CFC destruction credits
 - Stratospheric Ozone and Climate Protection Fund to receive all allocation auction and sale proceeds, to be used for manufacturer transition assistance, consumer incentives, refrigerant management, multi-lateral fund assistance
- Senate Introduces S.1733, the Clean Energy Jobs and American Power Act with nearly identical HFC provisions.

Business-as-usual HFC Demand Scenarios Compared to H.R. 2454/S. 1733 Reduction Schedules



H.R.2454/S.1733 Provisions

- HFC Provisions
 - HFCs are covered separately from other GHGs by amending Title VI of the CAA, which currently regulates ozone-depleting substances (ODS)
 - Class II substances under Title VI would be split into two groups, with group I containing the hydrochlorofluorocarbons (HCFCs) and group II containing the HFCs
 - Gases regulated under Title VI are not considered to be greenhouse gases in this bill

H.R.2454/S.1733 Provisions

- HFC Provisions
 - Overall production of HFCs is phased down beginning in 2012 and ending in 2032
 - Reduction percentages contained in the bill are measured against a 2004-2006 average baseline that includes both HFC and HCFC production (on a GWP-weighted basis)
 - EPA will determine the baseline - must be between 280 - 370 MMTCO_{2e}

H.R.2454/S.1733 Provisions

HFC Reduction Schedule

2012	-	90% of baseline	2023	-	54%
2013	-	87.5%	2024	-	50%
2014	-	85%	2025	-	46%
2015	-	82.5%	2026	-	42%
2016	-	80%	2027	-	38%
2017	-	77.5%	2028	-	34%
2018	-	75%	2029	-	30%
2019	-	71%	2030	-	25%
2020	-	67%	2031	-	21%
2021	-	63%	2032	-	17%
2022	-	59%	after 2032	-	15%

H.R.2454/S.1733 Provisions

- HFC Provisions - Essential Use
 - Because HFCs are added to Title VI of the existing CAA, the essential use, labeling, nonessential product, safe alternatives, and other provisions of Title VI that cover class II ODS would be extended to HFCs
 - Essential use exemptions historically only apply if unable to obtain any new or recycled agent for a very small number of uses like aviation, military, oil and gas

H.R.2454/S.1733 Provisions

- HFC Provisions - Labeling
 - Products containing or made with HFCs would be required to be labeled with the phrase “contributing to global warming”
 - EPA can exempt products from labeling if it determines they have similar GHG impact to other substances used in similar products

H.R.2454/S.1733 Provisions

- HFC Provisions - Destruction
 - Offset credits are provided at a 20% discount for destruction of CFCs after 2011 in the US
 - EPA can add other class I or class II ODS to the list of substances that could be destroyed
 - HFCs cannot be added to list of substances that can be destroyed for offset credits
 - If EPA determines that insufficient destruction occurs, it can add ODS destruction to list of offset projects that receive credit in the main program

H.R.2454/S.1733 Provisions

- HFC Provisions - Allowances
 - Allowances are required to produce/import HFCs, or import products containing HFCs
 - Allowances are refunded for export of HFCs
 - 80% of allowances are for HFC producers and importers (Producer-Importer Pool)
 - 20% of allowances are for manufacturers and importers of equipment containing HFCs and HFC reclaimers (Secondary Pool)
 - Importers of products containing HFCs get priority on allowances from secondary pool

H.R.2454/S.1733 Provisions

- HFC Provisions - Allowances
 - 10% of allowances in Producer-Importer Pool are auctioned in 2012, rising to 90% by 2020
 - The minimum auction price and non-auction sales price for allowances are set in the early years of the program as follows:
 - \$1.00 per MT in 2012, \$1.20 in 2013, \$1.40 in 2014
 - Minimum auction price rises to \$1.60 in 2015, \$1.80 in 2016, \$2.00 in 2017, and then increases with inflation for the rest of the program
 - After 2017 the non-auction sales price is equal to the auction clearing price

H.R.2454/S.1733 Provisions

- HFC Provisions - Transition Assistance
 - Transition assistance available 2012 - 2022
 - List of products for which assistance is available
 - Refrigerators, freezers, dehumidifiers, air conditioners, foam insulation, technical aerosols, fire protection systems, and semiconductors
 - Transition assistance “may” be for design and configuration of, and redesign and retooling of, facilities to manufacture “consumer products” with no or low carbon equivalency and no ozone depletion potential

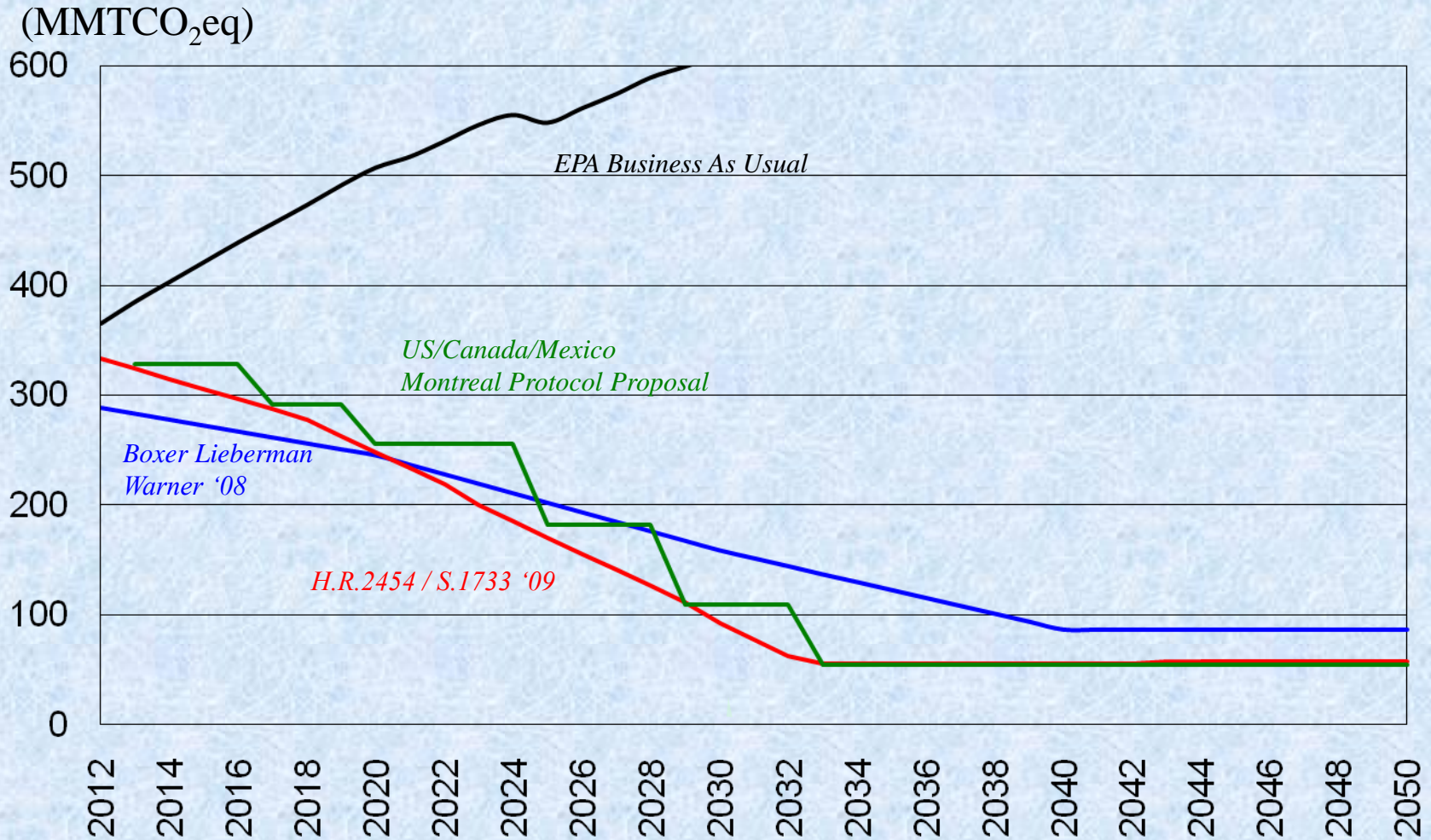
H.R.2454/S.1733 Provisions

- HFC Provisions - Transition Assistance
 - Proceeds from sale of allowances are deposited in the “Stratospheric Ozone and Climate Protection Fund” created by the bill
 - Funds are designated for specific uses including recycling and reclamation, MP Multilateral Fund or similar multilateral fund, and low global warming product transition assistance
 - Transition assistance program would allow EPA to distribute funds to manufacturers of products containing HFCs to facilitate the transition to low-carbon alternatives

US/Canada/Mexico Montreal Protocol Proposal

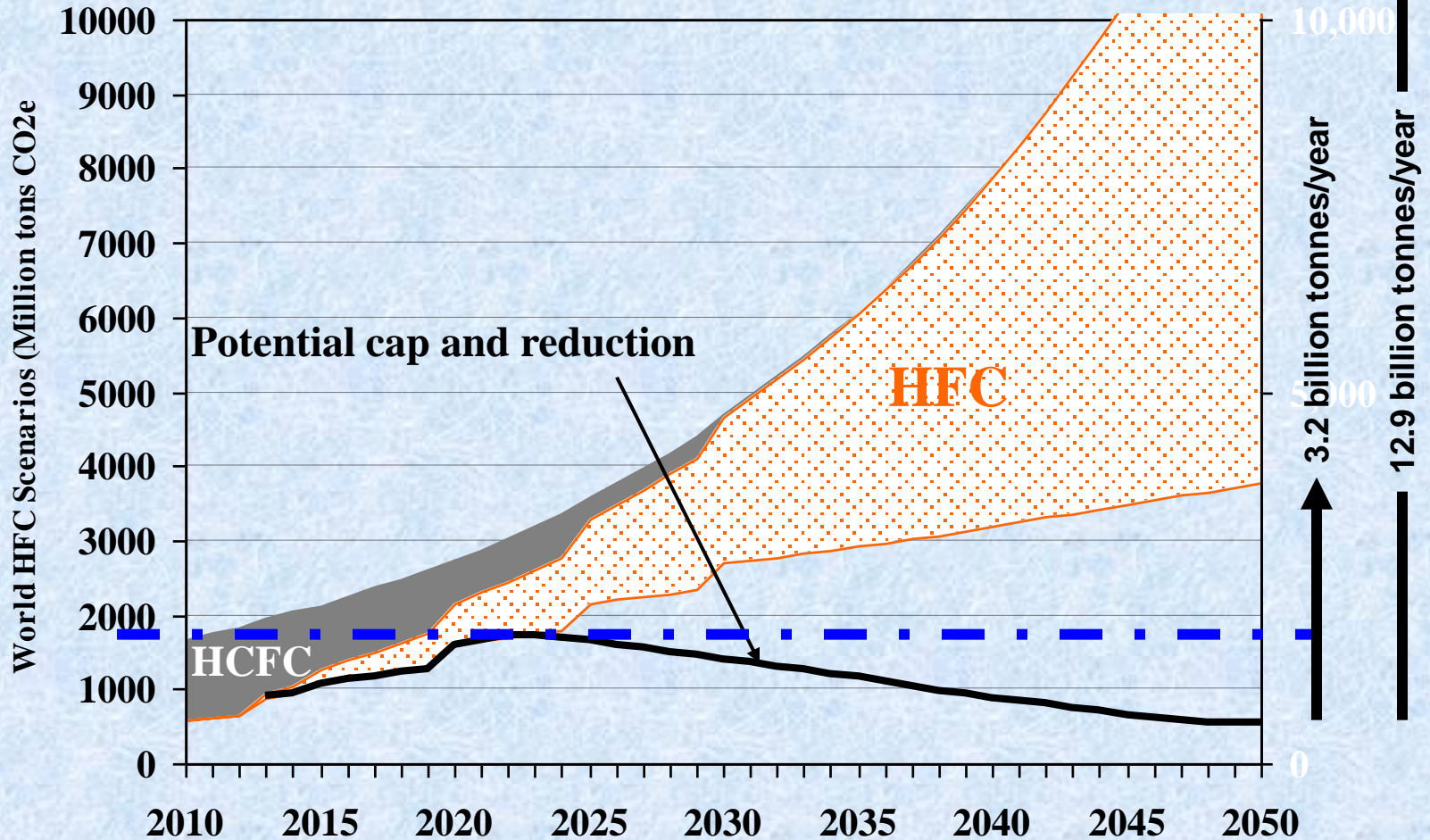
- Key elements of the proposal:
 - Lists 20 specified HFCs as a new Annex F to the Protocol
 - Recognizes that there are not alternatives for all HFC applications and therefore utilizes phase down mechanism, rather than phase out.
 - Provisions for phase down of developed country production and consumption are similar to Waxman-Markey (see following chart).
 - Establishes provisions for developing country phase down: 10% in 2016, 85% in 2043 with interim steps.
 - Requires reporting and licensing of HFCs.
 - Leaves unchanged UNFCCC/Kyoto Protocol provisions for HFCs.

U.S. HFC CAP PROPOSALS



Global HFC Consumption Scenarios

Potential CO₂e savings
in 2050



CFC Destruction Credits

- Integral to the 20-year old Fluorocarbon policy process.
- Substantial environmental benefits.
- Policy process needs to create proper market based incentives to capture achievable reductions.

Summary

- Montreal Protocol already achieves more greenhouse gas emissions reductions than the current Kyoto Protocol
- US HFC approach, if adopted, achieve 16-25 billion tons CO₂e reductions between 2012 and 2050, in the US alone
- Global focus will help keep HFC contribution in check
- U.S. approach applied globally can reduce between 3-13 billion tons CO₂e reductions per year
- Important to emphasize technical, economic, safety and energy efficiency issues