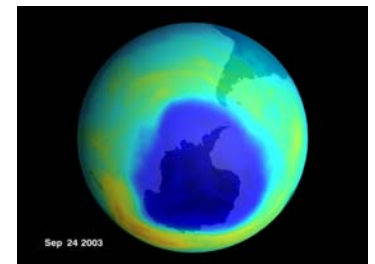


The 2010 HCFC-22 Phase Down

2007 HVACR & Plumbing Instructor Training

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Presentation

- I. 2010: Next major milestone in the HCFC phaseout

- II. Analysis of Servicing needs: 2010-2020

- III. Ban on HCFC Equipment



Montreal Protocol

Montreal Protocol:

Collaborative international effort to phase out ozone-depleting substances (ODS)

- More than 190 countries
- Parties reduce & eliminate ODS worldwide/step-wise
- Recovery of the ozone layer to pre-1980 levels expected during the middle of this century



Clean Air Act

Clean Air Act:

Ensures we meet Protocol obligations

- Tools to foster transition:
 - Bans, servicing requirements, labeling, alternatives
- Class I substances largely phased out (e.g., CFCs)
- Class II substances (HCFCs) now being phased out
 - According to 1993 schedule, based on ozone depletion potential (ODP)

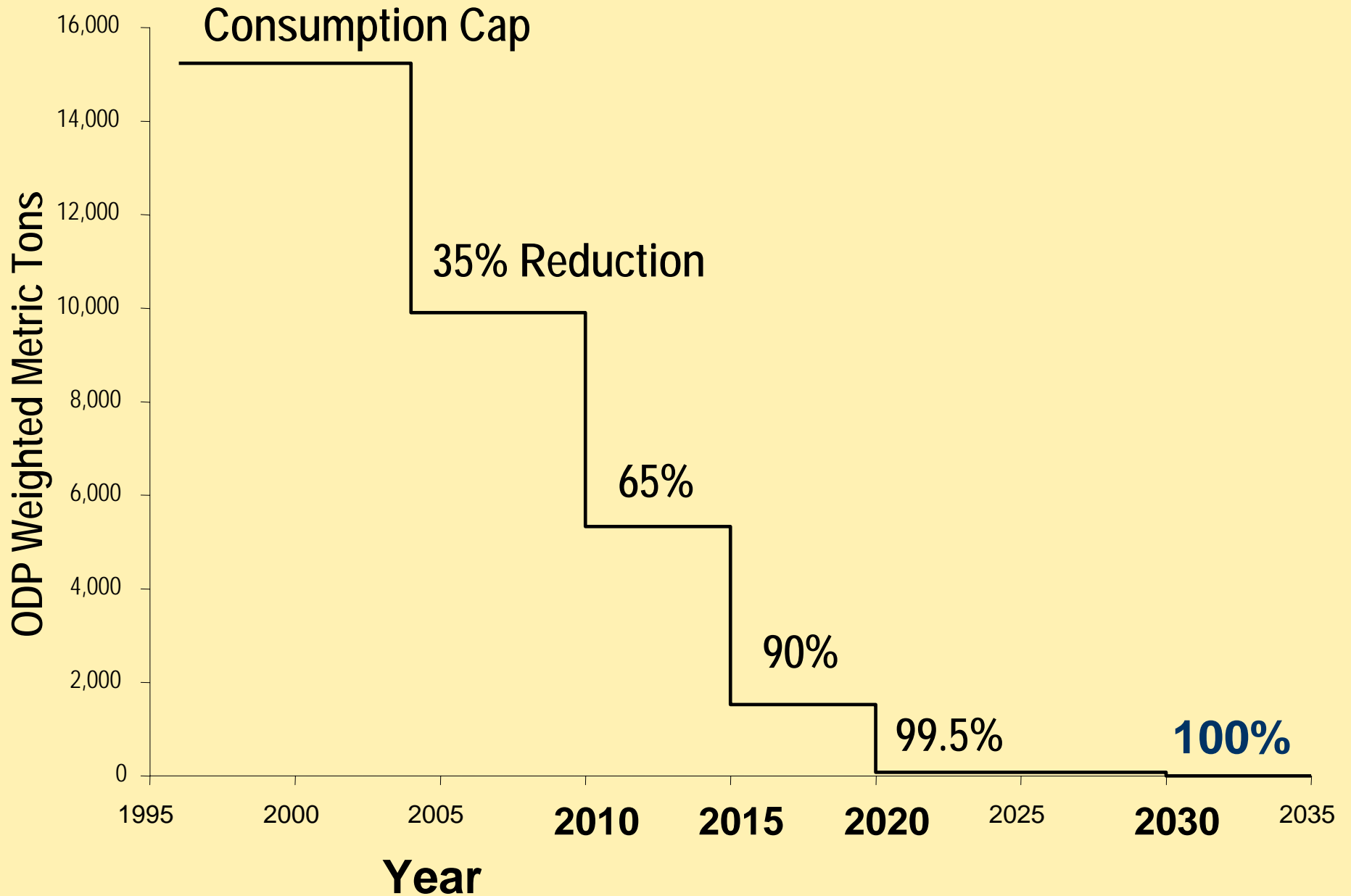


I. 2010 – Next Major Milestone in the HCFC phaseout

Why are HCFCs being phased out?

- Ozone-depleting substances such as HCFC-22 deplete stratospheric ozone, which shields the Earth from UV radiation
- Overexposure to UV radiation can cause skin cancer, cataracts, immune system weakening, ecological effects

HCFC Phaseout Schedule—Under Protocol



Milestones in the HCFC-22 Phaseout

- | | |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1/1/2010 | Ban on production & import of 22 & 142b except for on-going servicing needs in equipment manufactured before 1/1/2010* |
| 1/1/2015 | <p>Ban on introduction into interstate commerce or use of all HCFCs except where the HCFCs are used as a refrigerant in appliances manufactured prior to 1/1/2020*</p> <p>Ban on production or import of HCFCs except where the HCFCs are used as a refrigerant in appliances manufactured prior to 1/1/2020*</p> |
| 1/1/2020 | Ban on remaining production & import of HCFC-22 & HCFC-142b* |
| 1/1/2030 | Ban on remaining production & import of all other HCFCs* |

*Certain exemptions apply including HCFCs that are: recovered & either recycled or reclaimed; or used in processes resulting in their transformation or destruction.



U.S. HCFC Phaseout Regulations

1993 rule established framework/schedule

- 'worst-first' approach

2003 rule allocated allowances:

- Phased out **HCFC-141b** production, import
 - Cut U.S. consumption 35%
- Issued baseline allowances to based on historical production, import of **HCFC-22, HCFC-142b**
 - Allocated allowances HCFC-22 & HCFC-142b
 - Allocated 100% of consumption & production caps
 - Allocated allowances to individual companies



Today: Importing and Exporting HCFCs

- **Importing:** Must hold allowances to import virgin HCFC-22 and HCFC-142b in bulk
 - Comply with recordkeeping & reporting rules
 - Must have EPA approval to import used HCFCs
- **Exporting:** Allowances not currently required (but annual reporting is required)
 - Companies should contact destination country to ensure compliance with its domestic requirements
 - Some countries have banned HCFC imports
- **Trades of allowances:** allowed between entities as well as between different HCFCs
 - EPA notification and offset requirements apply



Meeting the 2010 Milestone

EPA will reduce allowances for HCFC-22 & HCFC 142b January 1, 2010

- Production & import of virgin HCFC-22 & 142b will be for servicing existing equipment only
- Newly manufactured appliances (e.g., refrigeration & a/c equipment) in US will not be charged with virgin HCFC-22, HCFC-142b or blends containing these substances



Meeting the 2010 Milestone (continued)

Production & Consumption Allowances ~ EPA must determine the allowance amounts while:

- Staying below the Montreal Protocol caps
- Ensuring production/imports are for servicing only
- Recognizing the role of recovered refrigerants
- Analyze amounts of HCFC-22 & HCFC-142b needed
- EPA will propose allowance allocations in 2008
- EPA will likely also allocate baseline allowances for all other HCFCs (such as 123, 225ca, 225cb)
 - Future rulemaking will step down those allowances



Servicing Existing Equipment after 2010

- Consumers won't be required to stop using HCFC-22
- Consumers won't be required to replace existing equipment
- Existing (pre-2010) equipment using HCFC-22 or HCFC-142b may be serviced as usual
- After 2010, supplies of HCFC-22 will be more limited
- After 2020, only stockpiled or reclaimed HCFC-22 will be available



II. Analysis of Servicing Needs: Study Objective and Focus

- Help EPA set allocation for future consumption caps by projecting:
 - Units of equipment using HCFCs beyond 2010
 - HCFCs needed to service equipment after 2010
- Analysis focused on HCFC-22 for refrigeration and AC equipment servicing needs
 - Largest industry sector and most widely used HCFCs in the U.S.



Methodology

- Initial estimates based on EPA's Vintaging Model and input from industry
 - presented in preliminary draft report (Nov.2005)
- Updates made to Vintaging Model and comments resulted in a revised draft report (Sept. 2006)
- Two supply scenarios modeling varying refrigerant recovery and reuse rates from retired equipment



Description of Projected R-22 Supply Scenarios

- **Scenario 1:**
 - **50%** of the refrigerant in retired equipment is recovered and reused in equipment
 - **50%** is not available for reuse
- **Scenario 2:**
 - **10%** of the refrigerant in retired equipment is recovered and reused in equipment
 - **90%** is not available for reuse



General Findings

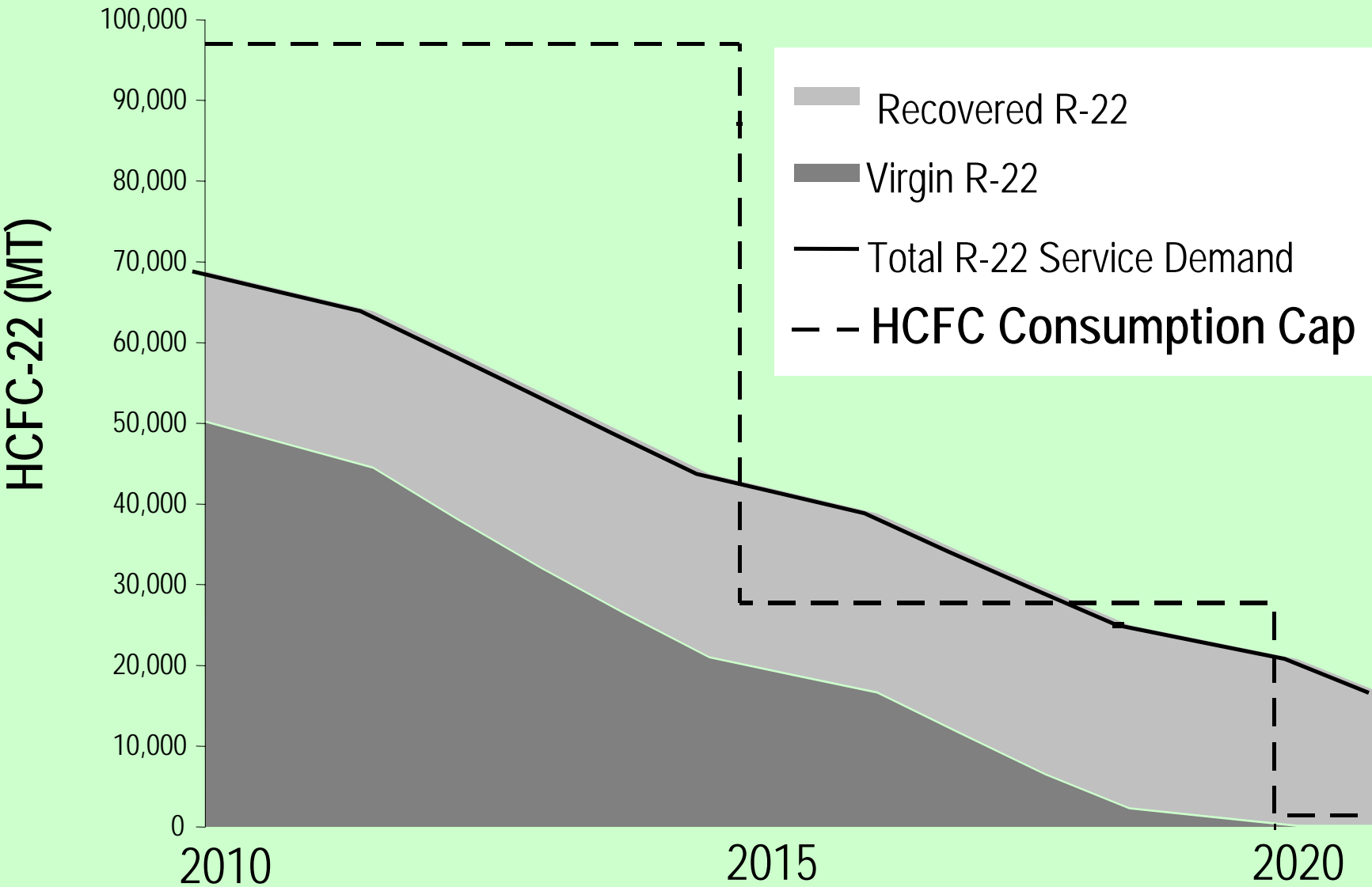
- Projected R-22 servicing demand (metric tons):

Equipment Type	2010	2015	2020
Total AC	41,400	26,800	12,100
Total Refrigeration	27,200	16,400	8,500
Total	68,600	43,200	20,600

Source: EPA's Vintaging Model (VM IO file_6-30-06_ALL)

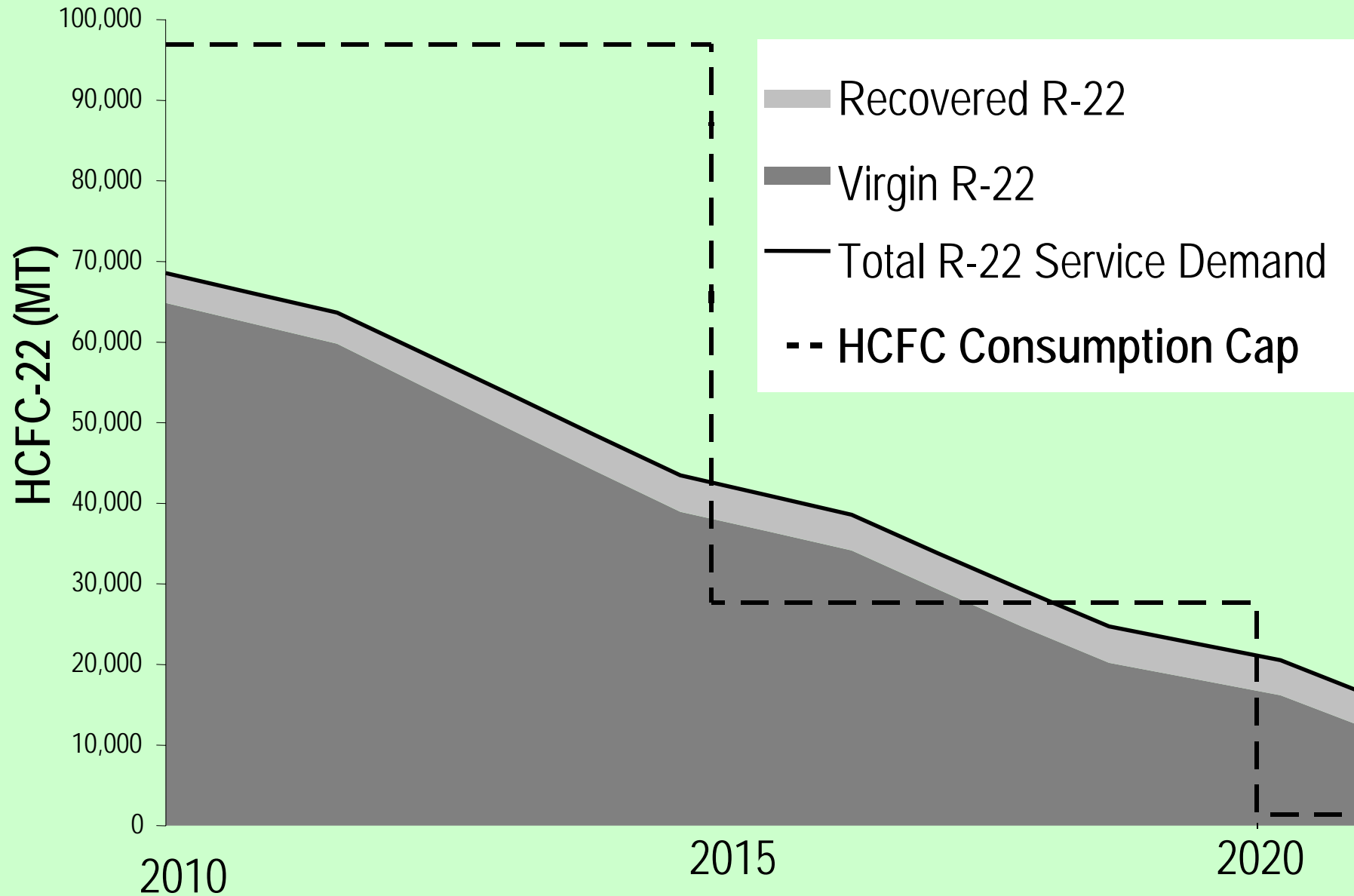
- **Projected R-22 servicing demand exceeds the consumption cap starting in 2015**
- **Use of recovered/reclaimed refrigerant will be necessary to avoid R-22 supply shortages.**

Results: Scenario 1: (50% Recovery)



Source: EPA's Vintaging Model (VM IO file_6-30-06_ALL)

Results: Scenario 2 -- (10% Recovery)



Source: EPA's Vintaging Model (VM IO file_6-30-06_ALL)



Which R-22 Projection Scenario is more likely?

What factors are important?

- Changes in equipment charge sizes to accommodate 13 SEER energy standard
- Rate of market transition to alternative refrigerants
- HCFC-22 cost
- Leak rates and servicing loss rates
- **Levels of refrigerant recovery for reuse, reclamation, and/or banking**
- Levels of imports of used HCFC-22
- Volume of pre-charged HCFC-22 equipment imported



III. Ban on HCFC Pre-Charged Equipment

- The intent of Clean Air Act was to end the use of ODS not to end solely the domestic manufacture of products containing ODS
- CAA establishes requirements to:
 - Ban emissive uses, establish safe servicing procedures to limit emissions, phaseout ODS production, import, and export, identify alternatives, etc.
 - All in an effort to assist with a smooth transition to alternatives
- Pre-Charged products are charged with refrigerant before being sold in interstate commerce
 - e.g.; small appliances



Potential Proposed Ban

- CAA already restricts import of HCFCs in bulk - but not after the substances are charged into air-conditioning & refrigeration equipment
- EPA is proposing to **ban**:
 - The sale and distribution in interstate commerce of all air-conditioning and refrigeration equipment (including import and export) containing HCFC-22, HCFC-142b, and/or blends
- Similar to the current ban on air-conditioning and refrigeration appliances containing CFCs
 - Issued after the 1996 CFC phaseout



Why Propose a Ban?

- Without banning pre-charged products there could be continued impacts on stratospheric ozone
- Increased potential for improperly servicing or venting
 - Because these products could not be legally charged with virgin HCFCs
 - ◆ could lead to servicing by non-certified technicians, unaware of the servicing requirements

Important: with or without the ban improperly servicing and venting would still be illegal!



Why Propose a Ban? (continued)

- US market for imported HCFC-charged appliances could delay the phaseout of HCFC production abroad
 - Our continued desire for products containing HCFCs could lead to greater manufacture of HCFCs and products containing HCFCs abroad
 - Efforts to assist countries to move to non-ozone depleting alternatives could be hampered
- Suitable alternatives are already manufactured both domestically and abroad



Timeline for Issuing a Ban

- Analysis on the potential range of impacts is underway
- EPA intends to issue a proposed ban in Summer 2007
 - The proposed effective date will be January 1, 2010
 - ◆ Coincide with re-issuing allowances
 - Likely issuing a final rule in 2008
 - ◆ Depending on scope and volume of comments
- Provides early signals to the market



Summary

2010 is fast approaching!

- EPA will re-allocate HCFC-22 & -142b allowances
- No new HCFC-22 or HCFC-142b products made in the US

Uncertainty with future recovery & reuse of HCFCs

- Unclear what supply of recovered HCFCs will be
- Recovered used refrigerant from converted/retired equipment needed to avoid shortfalls

Potential ban on import/export of pre-charged AC&R products

More info:

www.epa.gov/ozone/title6/phaseout/index.html or

e-mail me at: newberg.cindy@epa.gov



Montreal Protocol Update

20th Anniversary of the Signing

- Several countries have submitted proposals to accelerate the HCFC phaseout
- US proposal includes four elements that can be considered individually or as a package:
 1. Accelerating the phaseout for both developed and developing countries by 10 years;
 2. Adding interim reduction steps for developing countries (similar to the steps we are taking in the U.S.);
 3. Setting an earlier date for developing countries to set a baseline and freeze HCFC consumption; and
 4. Phasing out the most damaging HCFCs first (as the U.S.)



Montreal Protocol Update 20th Anniversary (continued)

- Parties will discuss and review the proposals:
 - Workshop June 2-3
 - Open-Ended Working Group meeting June 4-9
 - Meeting of the Parties September 17-21
- 20th Anniversary provides opportunities