

### 3 Key Points on Ozone Depletion and Global Warming

Once again at the ASHRAE meeting and technical conference held in Chicago January 21-25, 2006 I had the opportunity to attend several presentations on Ozone Depletion and Global Climate Change. I as have said before, I always enjoy attending these updates presented by some of the world's foremost experts. At this conference the primary focus was on the recently released report "IPCC/TEAP Special Report: Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons." The report was produced by the Intergovernmental Panel on Climate Change (IPCC) and the Technology and Economic Assessment Panel (TEAP) on the invitation of the United Nations Framework Convention on Climate Change (UNFCCC) and the Montreal Protocol. The [summary report](#) is available for download from the IPCC website.

Key Point #1: The implementation of the Montreal Protocol has been successful in stemming the destruction of stratospheric Ozone and the replacement substances have a reduced impact on global warming compared to the substances previously used. Quoting from the report, **"Actions taken under the Montreal Protocol have led to the replacement of CFCs with HCFCs, HFCs, and other substances and processes. Because replacement species generally have lower global warming potentials (GWPs), and because total halocarbon emissions have decreased, their combined CO<sub>2</sub>-equivalent (direct GWP-weighted) emission has been reduced. Observations and model calculations suggest that the global average amount of ozone depletion has now approximately stabilized."** This is good news. Job well done.

Key Point #2: The amount of CFCs and other ozone depleting substances (ODSs) still in use continues to have a major impact on ozone depletion and climate change. This was the first time I've heard the experts address and emphasize the issue of "banks". Banks are the total amount of substances contained in existing equipment, chemical stockpiles, foams and other products not yet released to the atmosphere. Quoting the report, **"Current emissions of ODSs and their substitutes are largely determined by historic use patterns. For CFCs and HCFCs, a significant contribution (now and in coming decades) comes from their respective banks. There are no regulatory obligations to restrict these CFC and HCFC emissions either under the Montreal Protocol or the UNFCCC and its Kyoto Protocol, although some countries have effective national policies for this purpose."** In other words, despite the success enjoyed by the Montreal Protocol, it only addressed the production and new use of ODSs. In spite of the phase out of CFCs a decade ago, the emissions from existing equipment continue to have a significant impact and will continue to do so for decades to come. I think the impact of these banks will come under more scrutiny in the future. In other words, look for future regulations to not only address the production and new use of controlled substances, but also to address the phase out, recovery and destruction of existing banks.

Key Point #3: Commercial Refrigeration is a major contributor to the release of ozone depleting and global warming substances. Again, quoting from the report:  
● **Refrigerant leakage rates derived with a bottom-up approach suggest a global annual emissions rate of 30% of banked system charge, meaning that the refrigerant emissions typically represent 60% of the total emissions of GHGs resulting from the system operation.**

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- **Refrigerant leakage rate data from over 1700 full supermarket systems in USA and Europe were in the range of 3–22%, with an average of 18%.**

Those are annual leakage rates! It is clear that commercial refrigeration sticks out like a sore thumb compared to stationary air conditioning, mobile air conditioning, transportation refrigeration, industrial refrigeration, foams and aerosols. Clearly, large commercial refrigeration installations such as grocery stores are very “leaky” installations. And according to the business as usual (BAU) forecast they are expected to remain a major emission contributor. I don’t think it is unreasonable to expect future protocols to specifically address the commercial refrigeration industry segment to require reduction of both “banks” and “leaks”.

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