

The logo for ACR, consisting of the letters 'ACR' in a bold, white, sans-serif font on a green rectangular background.

AT WINROCK INTERNATIONAL

Ozone Depleting Substances

A red rectangular label with the word 'Hoval' in white text, attached to the side of the air conditioning unit.

WHAT IS THE CHALLENGE?

Ozone Depleting Substances (ODS) are materials like chlorofluorocarbons (CFCs) and hydrochloro-fluorocarbons (HCFCs) that are commonly used within refrigeration and air conditioning systems, aerosol sprays, medical devices and foam blowing agents for insulation and noise reduction in buildings, appliances, coolers, marine applications and industrial pipe insulation.



The destruction of ODS could be greatly accelerated if the price for carbon credits generated from destruction of ODS like HCFC-22 were to increase to the range of \$30-40 a ton.

CFCs and HCFCs are internationally designated as ODS because they participate in chemical reactions in the atmosphere that deplete the stratospheric ozone layer.

ODS are also some of the most dangerous greenhouse gasses (GHGs) in terms of climate change, with up to ten thousand times the heat trapping properties of carbon dioxide over a 100-year period. Global Warming Potential (GWP) is a measurement to assess the global warming impacts for different gasses compared to an equal amount of carbon dioxide over a period; CFCs have 100-year GWPs of between 4,750 to 10,900.

Although the production and consumption of CFCs has been phased out by all nations and HCFCs have been phased out by most developed nations¹ under the Montreal Protocol, the use of these ODS continues, and it is common practice in many countries to continue to recycle these compounds for reuse in equipment that was originally designed to use them until the equipment is retired.

ODS refrigerants leak into the atmosphere throughout production, use and disposal. Worse still, ODS are sometimes vented during servicing or disposal of equipment, although certain countries ban this practice. As equipment reaches end of life, there is dwindling use for the remaining ODS. Because destruction is not mandated, unused supplies can be stockpiled for long periods, over which time ODS leak into the atmosphere unless destroyed.

WHAT IS THE SOLUTION?

Under the Montreal Protocol, the production of CFC refrigerants within signatory countries was phased out in 2010 and since then significant progress has been achieved. The signatories have successfully phased out **98 percent** of total virgin ODS compared to 1990 levels, with most developed countries planning a full phase-out of HCFCs by 2030. According to recent **analysis**, the ban on producing new ODS is estimated to prevent as much as 0.5 to 1 degree Celsius of extra global warming by the end of the century. Or in other words, eliminating ODS like CFCs and HCFCs could avoid as much as the equivalent of 9 billion metric tons of CO₂ between 2020-2100, comparable to avoiding the emissions of nearly two billion passenger vehicles for one year.

However, despite the progress made under the Montreal Protocol, ODS still represent a significant input of GHGs into the atmosphere that can contribute to future global warming now and into the future. Destruction of ODS is a big bang for the buck, no regrets, common sense, right-now GHG mitigation strategy. ODS sitting in a stockpile is equivalent to being in the atmosphere as there is no other fate if not destroyed. The latest IPCC report, for the first time, dedicated a chapter to addressing the need to significantly remove or reduce pollutants like ODS that have a high GWP in the near-term. The report states that waiting to act on eliminating these GHG emissions will make it significantly harder for society to meet Paris Agreement targets.

HOW DO CARBON MARKETS HELP ADDRESS THIS CHALLENGE?

Absent the incentive provided by carbon markets, the only fate of any ODS that cannot be or is not recycled is to stockpile and eventually vent into the atmosphere. This is because destruction of ODS in the US and most other countries is not mandated by law and the costs to collect and destroy ODS are high. Carbon markets are essential for catalyzing climate action in the absence of regulatory requirements. The revenue generated from the sale of carbon credits from ODS destruction at current market prices can cover costs to collect and destroy ODS with high GWP like CFCs, making it profitable generating private sector interest.

However, destruction of ODS like HCFC-22, the most abundant ODS that continues to be recycled and reused,

is still not attractive at current carbon prices.

The destruction of ODS could be greatly accelerated if the price for carbon credits generated from destruction of ODS like HCFC-22 were to increase to the range of \$30-40 a ton.

ACR'S METHODOLOGY

ACR currently has two methodologies for the destruction of ODS to generate carbon credits.

The Methodology for the Quantification, Monitoring, Reporting and Verification of GHG Emission Reductions from the Destruction of Ozone Depleting Substances (ODS) and High-GWP Foam, specific to the U.S., allows eligible CFCs and HCFCs sourced in the U.S. to be destroyed in EPA-regulated destruction facilities in the U.S. This methodology is currently being updated to add Canada as a source country, to allow the destruction in a facility approved by the Montreal Protocol's Technology and Economic Assessment Panel (TEAP), and to expand the list of eligible ODS.

The "Methodology for the Quantification, Monitoring, Reporting and Verification of GHG Emission Reductions from the Destruction of Ozone Depleting Substances (ODS) from International Sources" allows destruction of eligible CFCs from international sources in any TEAP-compliant destruction facility in the world and EPA-permitted destruction facilities in the U.S. This methodology is also being updated to expand eligible ODS to HCFCs and other high-GWP halogenated compounds and to make eligibility and monitoring requirements more specific to different regions around the world.

These ACR methodologies provide access to carbon markets as an incentive to destroy these materials. They provide a framework for the quantification, monitoring, reporting and verification of GHG gas emission reductions associated with the sourcing and destruction of high GWP ODS sourced from stockpiles, equipment, refrigeration systems, or other supplies, including but not limited to cans, cylinders, and other containers of recovered, reclaimed or unused ODS.

Additional benefits

Diminishing supply of CFCs, and thus their increasing cost, helps to make the continued use of CFC-dependent equipment uneconomic, in addition to driving the

development of non-polluting CFC replacements. The increase in use of energy efficient equipment reduces GHG emissions, as well as other pollutants, while saving money. This also accelerates transition to natural refrigerants like ammonia and carbon dioxide that are naturally present in the environment and hence provide multiple environmental benefits compared to synthetic ODS.

Contact ACR



For more information or questions on A/R carbon projects, please contact the ACR forestry team at ACR@winrock.org

i Any country that is a developing country and whose annual calculated level of consumption of the controlled substances in Annex A is less than 0.3 kilograms per capita