Gaps between the Kyoto Protocol and the Montreal Protocol leave vast volumes of greenhouse gas emissions outside regulation. KRISTIAN BRÜNING and JEFF COHEN discuss whether the voluntary carbon market can step in

Beyond the Kyoto six

The production of chemicals that destroy stratospheric ozone, such as chlorofluorocarbons (CFCs) and carbon tetrachloride, has effectively ceased over the last 20 years under the Montreal Protocol. These ozone-depleting substances (ODSs) are also highly potent greenhouse gases (GHGs), with global warming potentials up to 10,000 times greater than carbon dioxide (CO_2). As large stocks of equipment and products that contain ODSs reach the end of their lives, it is critical that these chemicals are recovered for reuse or destruction. The global bank of ODSs contained in air-conditioning and refrigeration equipment, building and appliance insulation, fire suppression systems, and chemical stockpiles was estimated to exceed 20 Gigatons of CO_2 equivalent (CO_2e) in 2002 and is likely to remain above 18 Gigatons CO_2e in 2015 under most business-as-usual scenarios.[1] Neither the Montreal Protocol nor the Kyoto Protocol controls emissions of ODSs that were produced prior to phase-out deadlines and that remain in use or storage. Unless these gases are destroyed, they will eventually be released into the atmosphere through leakage, direct usage or accidental release.

Voluntary carbon markets have here an important opportunity to help meaningfully address an isolated, but massive, problem in the fight against climate change. Project developers and chemicals companies are starting to look to markets for financial incentives to undertake reductions of ODS banks that are being stockpiled or exist in older equipment. Developers are looking for clarity on applicable emission reduction methodologies and project boundaries in order to undertake these projects.

In August 2007, the Chicago Climate Exchange (CCX) adopted a protocol for creating emission offsets from ODS destruction projects undertaken in the US. The protocol applies to all ODSs whose production and import has been completely phased out. Destruction must be undertaken at a facility that meets the Environmental Protection Agency's (EPA's) Clean Air Act standards and, where applicable, RCRA[2] requirements on disposal of solid and hazardous waste. The first projects will soon be implemented.

Eventually, ODS banks may be included in future GHG trading schemes, or could become subject to targeted compliance programmes or licensing. Alternatively, regulations could mandate dismantling, recovery, and destruction of equipment containing ODSs while providing credits for improved destruction processes. In the short term, however, there is an urgent opportunity as older equipment is decommissioned and emissions from other relatively accessible banks are released. In 2005, for example, the EPA estimates that worldwide ODS bank emissions were 12–16 times larger than production of ODS emissions on a CO_2e basis.[3]

The only other current alternative for ODS-focused project developers in an emissions trading context is to use an independent validator to provide potential voluntary buyers with assurances of the quality of the reductions. This would entail developing a project similar to the Kyoto Protocol's Clean Development Mechanism (CDM), with a reliable baseline and monitoring methodology for calculating and verifying the emission reductions. These methodologies face challenges in avoiding leakage of ODS emissions into developing countries, and preventing misaligned incentives between equipment users and chemical suppliers.

Would the voluntary market be able to bear the weight of non-Kyoto GHG reductions? Market analysts have estimated voluntary carbon markets (excluding CCX) to have traded around 25 million–30 million tons in 2007. CFC reductions could easily supply a major share of that. ODS destruction can be achieved for roughly $3 per pound of chemical; for CFCs and halons, this would equate to less than $1-2/tonne CO_2e. There are additional costs associated with recovery of blowing agents from refrigerator cabinets. Carbon finance could help make these projects viable, but the price of the credits will be an important determinant. There is continued demand for recycled CFCs, halons and eventually hydrochlorofluorocarbons. A market-based incentive with the proper carbon price could encourage recovery and destruction of surplus ODSs that would otherwise be used for 'non-critical' applications for which environmentally-friendlier alternatives exist. At the same time, they would speed the transition to more efficient, climate-friendlier technologies.

In the absence of regulation and pre-compliance value, the pressing question is how attractive non-Kyoto reductions are to current buyers in the voluntary markets. Corporate buyers are biased towards renewable energy and energy efficiency projects that offer ready customer identification. These project types have also benefited from strong precedence under the CDM, lending increased certainty over quality. ODS reductions are not naturally suited for the current demand in the voluntary market given their industrial background. However, from a quality perspective, the destruction of an ODS that would otherwise be used in old, inefficient equipment and products makes a clear case on additionality. The challenge in bringing these reductions to market is in educating buyers about the benefits of reducing ODSs and proving the quality of these reductions.

ODSs represent the most prominent non-Kyoto GHG reduction opportunity, but we have also observed isolated discussions around the opportunity to reduce non-methane volatile organic compounds (VOCs). These present a more limited opportunity as they are subject to local air pollution regulations and generally have lower global warming potentials. However, large-scale opportunities to introduce catalytic or thermal VOC destruction equipment into factories (eg, into paint shops or the pharmaceutical sector) in developing countries would benefit from the added financial incentive associated with carbon finance. Developing such projects will face several challenges, some of which could be alleviated by an endorsement from one of the voluntary carbon standards.

The above examples present two real opportunities for the voluntary markets to raise their game and recognise that they can have an impact on shaping new market solutions beyond simply filling technical loopholes in the Kyoto processes. By pro-actively encouraging project developers to bring forward methodologies and projects for ODS reductions, voluntary standards and protocols could influence potential future compliance markets and regulations. This would go a long way in legitimising the role of voluntary carbon markets. ***CF***

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1 *IPCC/TEAP Special Report on Safeguarding the Ozone Layer* (2006) (http://arch.rivm.nl/env/int/ipcc/pages_media/SROC-final/SROC_SPM.pdf)

2 Resource Conservation and Recovery Act

3 EPA, 2007: *Inventory of US Greenhouse Gas Emissions and Sinks, 1990–2005*, US EPA #430-R-07-002, April, 2007, Washington, DC.