POLICY BRIEFING

HFC-23 OFFSETS IN THE CONTEXT OF THE EU EMISSIONS TRADING SCHEME

SUMMARY

European countries are the major market for carbon credits associated with HFC-23 (trifluoromethane) destruction projects under the UNFCCC's Clean Development Mechanism (CDM).

The EU linking Directive allows Certified Emission Reductions (CERs) from the CDM to be traded in the EU Emissions Trading Scheme (ETS). It claims that the ***"environmental integrity"*** of the ETS will be safeguarded, while developing countries will be ***"assisted in achieving their sustainable development goals."***

Under current rules, the 19 registered HFC-23 destruction projects are expected to generate about 478 million CERs by 2012 and more than one billion CERs by 2020[1]. In 2009 European installations surrendered 46,364,460 HFC-23 CERs, worth an estimated €552 million[2]. However these CERs, which constitute the majority of offsets used by European companies (59% in 2009) to address their emissions reductions so far, do not contribute to sustainable development, and are so fundamentally flawed that they risk undermining the environmental integrity of the ETS as well as the CDM.

A request to revise existing rules for HFC-23 projects was submitted earlier this year by CDM Watch to the United Nations' CDM Executive Board. The submission provides overwhelming evidence that manufacturers are gaming the CDM system and undermining carbon markets by producing more potent greenhouse gases (GHGs) just so they can get paid to destroy them[3].

HFC-23 is an unwanted byproduct from the production of HCFC-22, a refrigerant gas that is currently subject to a phase-out under the Montreal Protocol due to its ozone-depleting properties. HFC-23 is a 'super greenhouse gas', with a Global Warming Potential (GWP) of 11,700, hence its destruction under the CDM yields thousands of offset credits or CERs. Since HFC-23 destruction is relatively cheap, the profits made from HFC-23 credits are enormous - as much as five times greater than the profits made from selling HCFC-22[4]. The new evidence shows that this perverse incentive has resulted in unnecessary HCFC-22 production in order to profit from the CERs issued through the destruction of the HFC-23 by-product. And since HCFC-22 is itself a powerful GHG (GWP 1,810), the CDM has actually financed increased production of two extremely potent GHGs.
Despite the vast sums of money involved in HFC-23 projects under the CDM, HFC-23 emissions are still increasing due to emissions from facilities not covered by the CDM. Efforts to address these non-CDM emissions are hampered because domestic legislation to address HFC-23 emissions would ostensibly destroy the 'additionality'[5] required by the CDM.

This briefing illustrates how HFC-23 projects under the CDM are working directly against the objectives of the UNFCCC and the Montreal Protocol, which is working to phase out HCFCs. HFC-23 emissions are clearly best addressed through direct measures outside the CDM. Setting the demand for the majority of CDM credits on a global scale, the EU has an important role to play in ensuring that HFC-23 credits will be excluded from the EU ETS.

Banning these credits from the EU ETS would open doors for sustainable solutions to abate emissions from HCFC-22 projects on a global scale. At the same time it would direct investment to where it is needed and enable credits from renewable energy technologies as well as from projects in geographically disadvantaged areas to meet Europe's offsetting demand in the future.

CDM Watch
Scrutinizing Carbon Offsets

14 JULY 2010

MAKING A GREENHOUSE GAS TO DESTROY A GREENHOUSE GAS – PERVERSE INCENTIVES UNDER THE CDM

HFC-23, a byproduct of HCFC-22 production, is one of the most potent GHGs ever produced. It has a 100 year GWP of 11,700[6] and can persist in the atmosphere for up to 270 years[7]. HFC-23 has very limited uses and is generally considered a waste gas. For every 35 tonnes of HCFC-22 that is produced, around one tonne of HFC-23 is generated[8]. The CDM issues CER credits for the destruction of the HFC-23 to prevent its atmospheric release, with one CER being generated for each carbon dioxide-equivalent (CO_2-eq.) tonne. This means that 11,700 CERs are issued for the abatement of just one tonne of HFC-23. While HFC-23 destruction projects represent just 2.5% of the CDM projects that have CERs issued so far, they account for 214 million of the 407 million tonnes of credits issued (52.6%)[9].

The CDM has generated a great deal of money for HFC-23 destruction projects, profiting mostly Chinese and Indian chemical companies and European financial backers, as well as the Chinese Government who substantially taxes the sale of HFC credits. Of 19 HFC-23 destruction projects registered, 11 are in China, five in India, and one each in Argentina, Mexico and the Republic of Korea. These projects cover less than half the estimated HFC-23 production in developing countries[10].

It is estimated that the destruction of HFC-23 can be carried out at a cost of just €0.17 per tonne of CO_2-eq[11]. However, when this destruction is commoditized and sold as CERs on the EU ETS market it can easily command as much as €12, some **70 times** more than it costs to destroy the gas. As such, HFC-23 destruction credits are so valuable that they exceed the value of the primary gas (HCFC-22) being produced by as much as five times[12].

GLOBAL HFC-23 EMISSIONS STILL RISING

The production of HCFC-22 is growing in developing countries by about 25% per year, and while the Montreal Protocol plans to phase out emissive (non-feedstock) uses by 2030, use for feedstock production is not controlled and is likely to continue to grow in developing countries[13]. As a result, global HFC-23 emissions have significantly increased over the last two decades, and although recent studies reveal a decline in emissions since 2006 associated with CDM destruction projects, over half of the developing world's HFC-23 production is still emitted.
A 2009 study in ***Geophysical Research*** Letters examining atmospheric concentrations of HFC-23 estimated average global HFC-23 emissions for 2006-2008 at about 200 million tonnes CO_2-eq per year, around 50% higher than levels derived for the 1990s[14]. The increase is attributed to developing country HCFC-22 production, with emissions in 2007 were estimated to be 160 million tonnes CO_2-eq. The study noted that substantial amounts of HCFC-22 were produced but not covered by existing CDM projects (around 57% in 2007)[15].

CLASH OF THE CONVENTIONS

The incredible profits made by HFC-23 projects are resulting in overproduction of cheap HCFC-22, and undermining global efforts under the Montreal Protocol to phase out HCFCs and move industry toward more environmentally friendly refrigerants.

The Montreal Protocol agreed in 2007 to accelerate the phase-out of HCFCs, not just because of their ozone-destroying properties but also because they are potent greenhouse gases. In April 2010, the Montreal Protocol's Multilateral Fund (MLF) agreed to guidelines on eligibility and criteria for funding the phase-out in developing countries. As national phase-out plans are implemented, some developing countries[16] will be in the position of receiving funding from the Montreal Protocol to reduce production of HCFC-22, while the CDM subsidises and promotes that same production.

The MLF has already identified that the facilities likely to be targeted for early phase-out are those registered under the CDM for HFC-23 destruction. The current CDM rules state that in order to be eligible for HFC-23 projects, HCFC-22 factories must have an operating history of at least three years between January 2000 and end of December 2004. As a result, older HCFC-22 factories tend to be those covered by the CDM, with newer ones not being eligible. This is likely to conflict with the accelerated HCFC phase-out, as older factories tend to be prioritised for closure[17]. Moreover, it is possible that CDM-financed older factories will displace newer factories with lower HFC-23/HCFC-22 ratios, and thus negate the potential to reduce the production of HFC-23 through technological improvements[18].

There are also legitimate concerns that the CDM will exacerbate the potential for developing a black market trade in HCFC-22.

[1] UNEP Risoe Centre www.cdmpipeline.org
[2] Data on HFC-23 CERs surrendered courtesy of Sandbag.org.uk, average CER price in 2009 was €11.9 according to the World Bank: State and Trends of the Carbon Market 2010. http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_of_the_Carbon_Market_2010_low_res.pdf
[3] Revision to AM0001 to address methodological issues https://cdm.unfccc.int/methodologies/PAmethodologies/revisions/58215
[4] One tonne of HCFC-22 has a market price of $US1000-2000. One tonne of HCFC-22 will produce around 0.03 tonnes of HFC-23 (based on the 3% ratio used in the CDM) which represents 444 CO_2-eq tonnes and therefore 444 CERs. At today's market price (€12.69) this is worth $5,634, which is 2.8 to 5.6 times higher than the value of the HCFC-22.
[5] CDM projects are required to be 'additional', ie. that the reductions achieved would not have happened in the absence of the projects.
[6] UNFCCC (2009), Greenhouse Gas Emissions Data, http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php, UNFCCC, Bonn, Germany
[7] Forster, P., et al. (2007), Changes in atmospheric constituents and in radiative forcing, in Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, edited by S. Solomon et al., pp. 129–234, Cambridge Univ. Press, Cambridge, U. K
[8] E.g. INEOS Fluor, CDM Project Design Document for the Republic of Korea: HFC Decomposition Project in Ulsan – Version 6.0 (17 Mar. 2005)
[9] Source: www.uneprisoe.org CDM Pipeline overview accessed 25th May 2010
[10] S. A. Montzka, S.A., Kuijpers, L., Battle, M.O., Aydin, M. Verhulst, K.R., Saltzman, E.S. and D. W. Fahey, 2010. Recent increases in global HFC-23 emissions. Geophysical Research Letters (37), L02808, doi:10.1029/2009GL041195, 2010
[11] IPCC & TEAP, IPCC/TEAP Special Report on Safeguarding the Ozone Layer and the Global Climate System: Issues Related To Hydrofluorocarbons And Perfluorocarbons (2005)
[12] Ref 4, ibid.
[13] Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol. Further Elaboration and analysis of issues pertaining to the phase-out of HCFC production sector. UNEP/OzL.Pro/ExCom/57/61 27 February 2009.
[14] 1Gg HFC-23 = 1000 tonnes HFC-23 = 11,700,000 CO_2-eq tonnes
[15] Montzka et al., ibid
[16] http://www.multilateralfund.org/news/1271429352850.htm
[17] Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol. Further Elaboration and analysis of issues pertaining to the phase-out of HCFC production sector. UNEP/OzL.Pro/ExCom/57/61 27 February 2009.
[18] Report of the 44th Meeting of the Methodologies Panel. 21-25 June 2010 http://cdm.unfccc.int/Panels/meth/index.html The note on the revision request by the Methodoloy Panel can be found at http://cdm.unfccc.int/Panels/meth/meeting/10/044/mp44_ano2.

The second largest HFC-23 facility under the CDM, Shandong Dongyue Chemical Company Ltd, which generates more than 10 million CERs each year, has previously been implicated in the illegal trade in ozone-depleting substances (ODS)[19].

THE PROFITEERS

To date, 214 million CERs have been issued from HFC-23 projects, and 476 million are expected in total by 2012[20]. Based on current prices in the European market (around €12), the HFC-23 CERs produced by 2012 will be worth almost €6 billion[21]. However, the real cost of the associated HFC-23 destruction is just €80 million[22].

A closer look at the money invested in these projects demonstrates the clear profit margins: between 2004 and 2010, project backers invested just €47 million in CDM HFC-23 projects, despite the fact that they constitute more than 50% of CERs issued to date. In fact, HFC-23 projects have by far the lowest rate of investment of all the CDM projects – just €0.80/CER/year, compared with several hundred dollars for hydro projects and thousands of Euros for solar projects[23].

Since the price of CERs is not linked to the actual cost of the CDM projects, the companies involved are making huge profits on the back of HFC-23 projects. Gujarat Fluorochemicals Ltd, which owns India's largest HFC-23 CDM project, reported added revenue of €66 million in 2007, solely through the sale of HFC-23 carbon credits[24]. The New York Times drew attention to this in 2006, citing plans for an HFC-23 incinerator at a HFC-22 plant in the Chinese city of Quzhou. While the incinerator would cost only €3.98 million to build, the plant would earn approximately €398 million in CERs.

The article reported that *"The huge profits from that will be divided by the chemical factory's owners, a Chinese government energy fund, and the consultants and bankers who put together the deal from a mansion in the wealthy Mayfair district of London."* [25]

Some carbon traders have also stated their concern that HFC-23 credits will create an over-supply of offsets in the third phase of EU ETS, even if the EU raises the emission reduction level to 30%. Karen Degouve, a buyer of carbon credits for French bank Natixis stated: *"Another long phase would surely kill the EU ETS and even harm cap-and-trade globally. The few people still supporting HFC 23 selfishly want to continue making money from an instrument with little environmental integrity and don't understand even that will not happen if the market collapses."* [26]

UN UNDER PRESSURE TO REVISE HFC-23 CDM RULES

A recent request to revise the HFC-23 methodology submitted to the CDM Methodology Panel has provided an analysis of all monitoring data submitted by the 19 registered CDM HFC-23 projects. The revision request, submitted by CDM Watch, provides new evidence that the current CDM methodology creates perverse incentives for plant operators to artificially increase HCFC-22 production, from which HFC-23 is an unwanted byproduct [27].

The analysis reveals that CDM HCFC-22 plants are intentionally operated in a manner to maximize the production of offset credits, resulting in more HCFC-22 and far more HFC-23 production than would occur without the CDM. The data show that two plants reduced HFC-23 generation when they were ineligible for credits and increased HFC-23 generation once they could again claim credits for destruction. One plant even stopped HCFC-22 production when it was not allowed to generate further offset credits and resumed operation when it became again eligible to generate credits. Moreover, the analysis reveals that many plants produce exactly the amount of HCFC-22 necessary to obtain the amount of HFC-23 credits they are allowed, whereas production was lower or varied from year to year before offset credits were rewarded.

The revision request suggests introducing an emission benchmark more in line with the actual costs of HFC-23 destruction in order to remove the perverse incentives but ensure that plant operators would still have sufficient economic incentives to destroy HFC-23. The key points of the proposal were supported by the Methodology Panel, which has requested further guidance from the CDM Executive Board[28].

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[19] EIA Briefing 2006. An Unwelcome Encore: The Illegal Trade in HCFCs, available from www.eia-international.org

[20] UNEP Risoe Centre www.cdmpipeline.org

[21] average CER price in 2009 was €11.9 according to the World Bank: State and Trends of the Carbon Market 2010. http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_of_the_Carbon_Market_2010_low_res.pdf

[22] Ref 11, ibid.

[23] UNEP Risoe Centre www.cdmpipeline.org, investors tab

[24] Gujarat Fluorochemicals, Analysis. Dalal Street. Juley 23-Aug 5, 07 – available from www.gfl.co.in

[25] New York Times December 2006. Keith Bradsher, "Outsize Profits, and Questions, in Effort to Cut Warming Gases", New York Times, December 21, 2006.

[26] Point Carbon article – IETA split on HFC 23 projects. www.pointcarbon.com/news/1.1459941

[27] Ref 3, ibid

[28] Ref 18, ibid.

[29] http://ozone.unep.org/Meeting_Documents/oewg/30oewg/OEWG-30-CRP-1E.pdf

[30] UNEP Risoe Centre www.cdmpipeline.org

ADDRESSING HFC-23 VIA THE MONTREAL PROTOCOL

CDM projects are an extremely ineffective way to deal with HFC-23 emissions. While the projects are successfully preventing emissions of HFC-23 from around half of current HCFC-22 production, fundamental flaws in the methodology and the huge profits made by the credits produced has driven unnecessary production of HCFC-22 and HFC-23. Furthermore, HFC-23 from those developing country installations that are not covered by the CDM is being vented into the atmosphere, resulting in increased HFC-23 emissions despite the billions being spent on HFC-23 offset credits. These non-CDM emissions, at least as great as those addressed under the CDM, urgently need to be addressed.

A promising solution would be to simply pay for the costs of HFC-23 incineration in all HCFC-22 production plants in developing countries. It is that simple, and far more cost effective than the CDM. The ideal implementing body for this action would be the Montreal Protocol on Substances that Deplete the Ozone Layer, which currently regulates the production of HCFCs. Its long history of successful technology transfer within this field means that it could simply use its existing compliance network to effect this transition.

A draft decision was submitted by Mexico, Canada and the U.S.A. to the Montreal Protocol at its Meeting of the Open-Ended Working Group in June 2010. It requested the Protocol's Executive Committee to formulate guidelines for implementing destruction projects at facilities currently not covered by the CDM. If adopted at the Meeting of the Parties in November 2010[29], this could potentially be expanded to deal with all HFC-23 emissions in future.

However the lucrative CDM business has resulted in fierce opposition to any rule amendment from Chinese and Indian HCFC-22 plant operators. It makes economic sense for them to fight any decision which puts their CDM revenues in jeopardy. As a result, outcomes of methodology revisions under the CDM and decisions on how to address HFC-23 via the Montreal Protocol risk being delayed.

By banning HFC-23 credits from acceptance in the EU ETS, Europe would send a clear and direct signal that this lucrative and unsustainable practice is over, encouraging plant operators and their respective governments to support more cost and environmentally effective solutions.

CONCLUSIONS & RECOMMENDATIONS

HFC-23 projects do not lead to sustainable development and produce no technology transfer beyond the initial installation of incinerators. The huge finances involved currently profiting the Chinese Government and Chinese and Indian chemical companies and project backers could be better used to support more environmentally ambitious and legitimate projects in Least Developed Countries.

All 19 registered HFC-23 projects are earmarked to produce around 500 million CERs by 2012 and about one billion by 2020. Without this cheap HFC-23 supply, the demand for offsets could be met by clean energy sources and direct more investment to Least Developed Countries. The difference in investment needs varies widely; while investment in HFC-23 projects averages at €0.80/CER/yr, solar power projects require more than €5,000/CER/yr. Banning HFC-23 would create much needed support for renewable energy systems in developing countries. The 10 million credits annually generated by the single largest HFC-23 project could be supplied by around 300 small scale CDM projects, e.g. solar cookers, solar water heaters or biogas projects.

HFC-23 destruction is best addressed by mechanisms outside the CDM, and preferably through the Montreal Protocol. The EU should prohibit the use of HFC-23 CERs in Phase III of the ETS, and companies that legitimately require offsets to comply with their reduction targets until 2012 should seek to use CERs from other CDM projects[30].

Within the context of upcoming quality restrictions of project types eligible in the EU ETS, the Environmental Investigation Agency (EIA) and CDM Watch recommend:

- The EU to apply additional quality assessment of HFC-23 credits in Phase II of the EU ETS (2008-2012) for credits not yet surrendered to ensure that fraudulent credits are not used to count towards the EU's climate targets in the current phase;

- The EU to prohibit the carryover of HFC-23 CERs from Phase II into Phase III from HFC-23 credits;

- The EU to wholly prohibit the use of CERs from HFC-23 in Phase III of the EU ETS.

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