

The future of industrial gas CERs and what it could mean for New Zealand

Brief

- The forthcoming decisions on HFC-23 and N₂O CDM projects will radically alter the market for offsets.
- According to IDEAcarbon analysis, 111.2 million HFC-23 and N₂O CERs are still in circulation. Under an amended methodology effective in second and third crediting periods, HFC-23 CER supply would be between 22 million and 52 million tonnes/year, depending on the degree to which the methodology reduces the yield.
- NZ ETS could be a major source of demand for these “homeless” CERs, which could make NZUs vulnerable to downward price pressure as industrial gas CERs seek out other markets.

Introduction

The recent decisions from both the Clean Development Mechanism Executive Board (CDM EB) and the European Commission (EC) on industrial gas CDM projects involving reductions of hydrofluorocarbon-23 (HFC-23) and nitrous oxide (N₂O) from adipic acid plants are set to radically reconfigure the global market for offsets. The effects of these decisions are far-reaching and could potentially have implications for the New Zealand Emissions Trading Scheme (NZ ETS).

The objective of this paper is to highlight that, beyond Europe, the NZ ETS could be a major source of demand for these “homeless” CERs. Due to a lack of restrictions on the use of CERs for compliance, NZ ETS credits (termed New Zealand Units – NZUs) could be vulnerable to downward price pressure as industrial gas CERs seek out other markets.

Background

Under the European Union Emissions Trading Scheme (EU ETS), companies can meet a part of their emission reduction obligations by purchasing cost-effective offset credits (CERs or Emission Reduction Units from Joint Implementation offset projects) under the UN-approved flexible mechanisms. Offsetting can include credit origination from projects involving the destruction of HFC-23 and N₂O industrial gases.

There are four problems with industrial gas reduction projects. First, they're extremely cheap to carry out. For example, it is estimated that the destruction of HFC-23 can be carried out at €0.17¹ per ton of CO₂ equivalent. But when these CERs are issued they currently command a price of €12.00 – seventy times more than it costs to destroy the gas. Second, the cost-effectiveness of these projects has created unintended perversities; HFC-23 CERs are so valuable they exceed the value of the

¹ IPCC & TEAP, IPCC/TEAP Special Report on Safeguarding the Ozone Layer and the Global Climate System: Issues Related To Hydrofluorocarbons and Perfluorocarbons (2005).

primary gas (HCFC-22) by as much as five times², which has led to the widespread accusation that host countries are ramping up HCFC-22 output primarily to profit from CER revenue. Third, the current incentives for HFC-23 destruction undermine attempts under the Montreal Protocol to phase out HCFC-22 production. Fourth, the dominance of industrial gas has distorted the geographical distribution of projects under the CDM in favour of China and India.

The EC has proposed a ban to come into force from January 1st 2013. The proposal is due to be discussed by a committee of member states before going to the European Parliament to be scrutinised, with a decision expected in three months.

The CDM EB's Methodologies Panel has recommended that the AM0001 methodology which governs the generation of CERs from HFC-23 reduction projects should be revised. According to a paper delivered to the EB at this week's meeting, "it is likely that emissions reductions could be overestimated, since there is no incentive to reduce the w-factor", referring to the ratio of HFC-23 emitted by a plant producing HCFC-22 refrigerant gas.

There is currently no indication as to by how much an amended methodology would cut CER yield. The CDM EB has decided to revise the AM0001 methodology, which will then be applied to each project as it reaches the end of its current crediting period. With the largest number of HFC-23 projects coming to the end of their first crediting period between 2012 and 2014, this means that CER yield could drop significantly thereafter.

Industrial gases currently comprise 75% of CER output to date. With regulated entities within the NZ ETS being allowed virtually unlimited use³ of CERs to meet their compliance, these industrial gas CERs could soon overshadow the New Zealand market.

Future scenarios of HFC-23 CERs

To determine how many CERs will be issued from industrial gas projects in the future we have undertaken a scenario analysis of HFC-23 issuance as an example.

There are 19 HFC-23 projects registered under the AM0001 methodology, of which fifteen have applied for three seven-year crediting periods, and the remaining four a single ten-year period. Our calculations have taken account of these variances. Not all crediting periods begin and end at the same time, and we have also taken this into account. Crediting takes place from the first project's launch in January 2003 and runs until the final project's third crediting period ends in April 2030. In our calculations we have assumed that the CDM EB will amend the methodology only once and not impose any further changes to the methodology in a project's final crediting period.

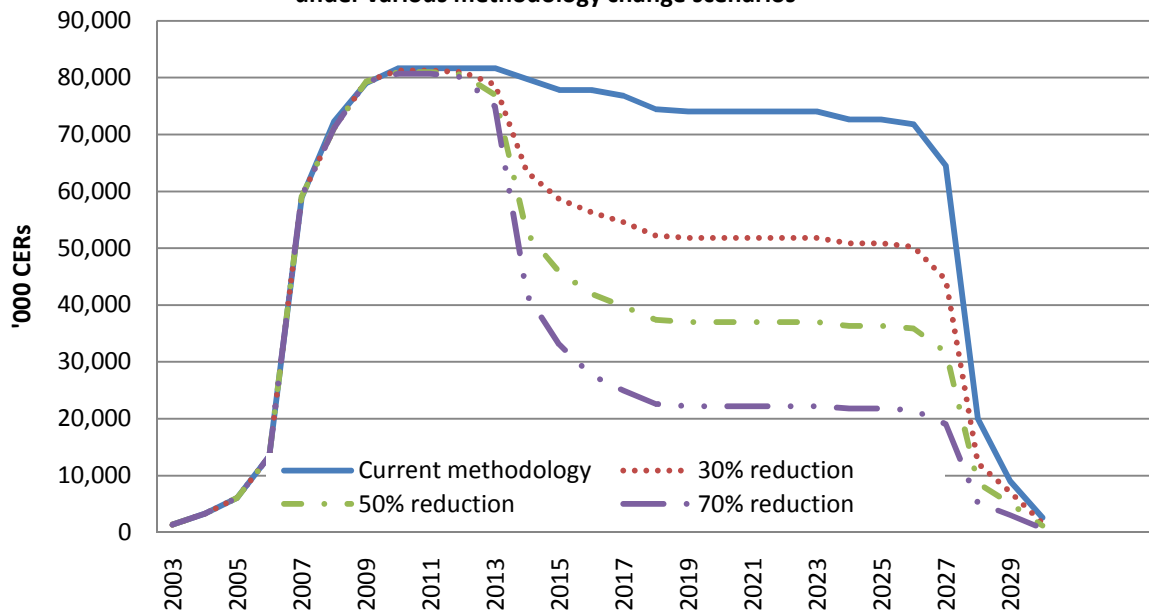
The result of our work shows that under an amended methodology effective in second and third crediting periods, HFC-23 CER supply would be between 22 million and 52 million tonnes/year, depending on the degree to which the methodology reduces the yield. None of this output would be eligible for use in the EU ETS.

We have included a baseline projection that demonstrates what output would have been like without any changes to the methodology. This baseline output has been guaranteed during the years 2003–09, during which no plant reached the end of its first (or only) crediting period.

² For example, one tonne of HCFC-22 has a market price of \$US1000-2000. One tonne of HCFC-22 will produce around 0.03 tonnes of HFC23 (based on the 3% ratio used in the CDM) which represents 444 CO₂e 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 HCFC22.

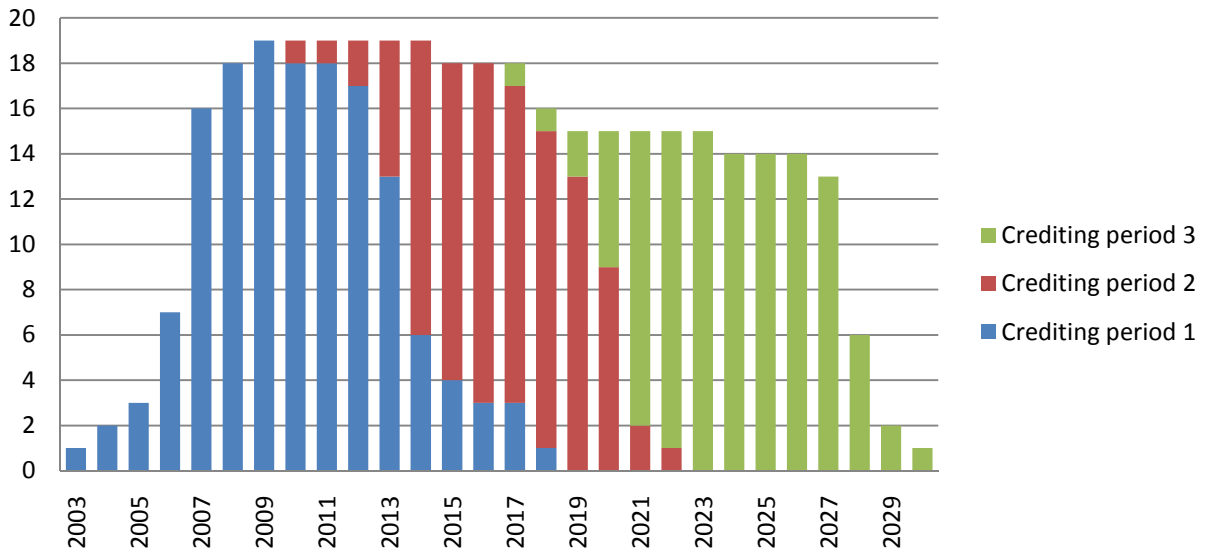
³ See <http://www.climatechange.govt.nz/emissions-trading-scheme/> for more information.

Figure 1: CER issuance from HFC-23 projects under various methodology change scenarios



Reductions in output over the period under each scenario partially reflect the fact that four projects have selected to apply only for a single ten-year crediting period, as well as overall reductions in yield. Figure 2 below shows the rate at which crediting periods will expire and, naturally enough, mimics the overall shape of Figure 2. Finally, we calculate that the total issuance of CERs from HFC-23 projects under the three scenarios will range from 1.63 billion tonnes under a business-as-usual case, to just 908 million tonnes under a 70% reduction in yield during second and third crediting periods.

Figure 2: HFC-23 plants by crediting period



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Total issuance of CERs from HFC-23 projects	
Phase 2 issuance (ending 31/12/2012)	479,110,000
Post-Phase 2: 30% cut to end of eligibility	840,303,600
Post-Phase 2: 50% cut to end of eligibility	634,857,800
Post-Phase 2: 70% cut to end of eligibility	429,130,500

A short note on N2O

There is presently no proposal to reduce the yield of CERs from N2O projects – the only change being contemplated is the EC’s likely ban on the use of N2O CERs for compliance after 2012.

There have been allegations that the methodology for reductions of N2O at adipic acid plants (there are four such projects in the CDM) is overly generous and is leading to some relocation of production to CDM-registered locations. Adipic acid plants have generated 98.2 million CERs, or around 21.8% of all CERs issued to date.

However, there is no apparent issue with projects to reduce N2O emissions from nitric acid plants, of which there are 58 registered projects; these projects are thought to have successfully fostered innovation and emissions reduction. A total of 15.2 million CERs (3.3% of all CERs to date) have been generated from these projects.

The Impact on the NZ ETS

What do we think will happen? Since the EC has been consistent with its statements about the future of HFC-23 and N2O CERs from the 1st January 2013 onwards, we are confident that market participants have already priced in this decision.

What does this all mean for the NZ ETS? HFC-23 and N2O CERs are already beginning to compete with NZUs. The relatively illiquid NZ ETS has been flat as buyers continue to wait for increased supply of NZUs when allocations of forestry and pre-1990 NZUs reach the market. Because of the sluggishness of the NZ ETS market and cumbersome nature of OTC deals, NZ ETS participants can enter the more liquid and transparent CER market to secure compliance. This dynamic could become increasingly common if the EC and CDM EB ruling is unfavourable, which could potentially push the price of HFC-23 and N2O CERs below NZUs.

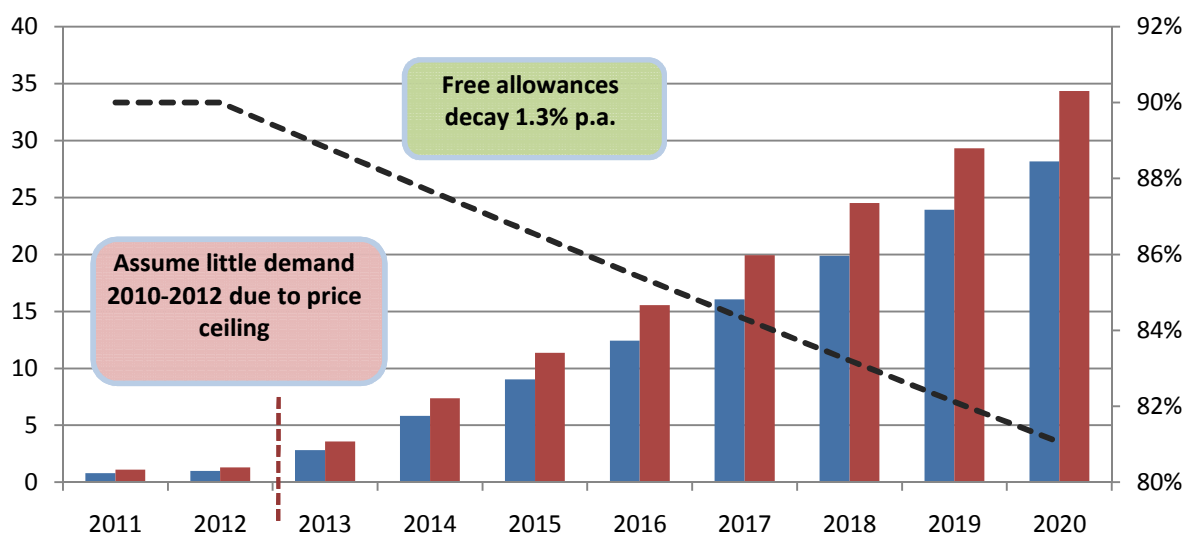
But when more NZUs are issued and trading picks up, it’s possible that prices will slip to reflect the increase in supply, taking New Zealand’s market out of range as a destination for CERs in the near term. But once the EU has washed its hands of these offsets, and their price begins to drastically fall, we would expect to see opportunities for NZ ETS compliance buyers.

As the above analysis suggests, beyond Europe, New Zealand is currently the only established marketplace for the decreasingly relevant HFC-23 and N2O CERs. While Japan has hitherto been keen to acquire CERs for corporate voluntary compliance, the country’s focus has shifted to sovereign-level Assigned Amount Units (AAUs) which private buyers can surrender to their government for compliance, and which the government can then use for its Kyoto compliance and bi-lateral offset projects.

It is possible that some Annex I governments may consider “mopping up” cheap CERs despite their provenance, but there is also the AAU market to consider, and seller governments eager to sell their sovereign allowances for much-needed cash will provide stiff competition. European member states are in principle covered by the EU ETS ban on industrial gas CERs, but we understand they will be able to use these offsets as long as they inform and explain the reason to the EC.

As our analysis suggests, whatever the scenario, there will still be ample supply of HFC-23 and N2O CERs once the EU ETS ban and a new methodology are in place. A cursory look at NZ ETS offset demand (Figure 3) reveals that displaced HFC-23 and N2O CER supply will far exceed demand. If there is cost parity between NZUs and CERs, the illiquid and shallow NZ ETS market will quickly be flooded by foreign CERs looking for a home.

Figure 3. Max potential demand for offsets (Mt), free allowances Source: IDEACarbon



Decisions, decisions

The New Zealand government needs to make a decision on this issue. The decision on whether to include or exclude industrial gas CERs requires careful consideration. Compared to Europe, New Zealand currently takes a cavalier approach to emissions reductions, but the inclusion of HFC-23 and N2O CERs would undermine their clean green image.

Furthermore, greater attention needs to be given to regulatory consistency amongst national and regional markets, otherwise arbitrage and inter-system gaming will become rife. Currently, this is being given paltry regard amongst all the talk of an international carbon market.

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