

Cleaning up?

01/11/2006

Carbon finance – the buying and selling of emissions credits – is nearing mainstream acceptance. Several investment banks, usually through their London offices, trade certified emission reduction credits, and the larger hedge funds have been among the investors in funds raised to buy them. Developers of carbon sequestration, offset, and reduction projects are gaining in size and prominence.

At its simplest, an emissions credit represents the right to emit a particular quantity of a particular pollutant. Originally, credits translated to a quantity of pollutants over or under a cap, fixed by government, a polluting industry emitted. Companies tended to trade these credits among themselves, beginning with the caps on sulphur dioxide that the US instituted in the 90s.

But the modern market has taken shape in the aftermath of 1997's Kyoto Protocol, which mandated reductions in emissions from developed markets, and enabled developing countries to sell credits from their emissions reduction projects to allow developed markets to exceed their target reductions. Such projects, known as clean development mechanism (CDM) projects, rely on the receipt of certified emission reductions (CER), and revenue from their sales, to be more economically viable.

But while emissions markets have been in existence for over 11 years, they have had not much more than a contextual impact on global project development. Indeed, while installations of renewable power capacity have surged during this period, the few large-scale projects have concerned themselves with either the compliance burden associated with carbon markets or the revenue from certified emissions reduction credits.

Not developing as planned

This shakiness in the connection between carbon markets and project development is surprising, since the market for emissions credits, by creating price signals, was in part designed to guide investment in energy infrastructure. Nowhere is this more explicit than the clean development mechanism, whereby emerging market projects often rely on credit sales for part or all of their revenue. As Martijn Wilder, partner at Baker & McKenzie, and head of its climate change group, says, "the CDM was designed to be a form of project finance for reduction projects in emerging markets. It's now a \$22 billion a year market, and has attracted serious financial resources."

The reasons why the CDM market has not developed as planned are varied. One commonly noted obstacle is that project finance lenders are still unwilling to lend against the receipt of CERs. Lenders' aversion stems from the fact that the Kyoto emissions trading framework is only in place in its current form until 2012. And many of the projects are on such a small scale, or feature untested technology, or untried developers.

Nevertheless, CDM projects have been successful, in part because many of them require limited upfront capital, and can in theory be financed using local capital markets, which have tenors that more closely match the production life of credits. Moreover, while carbon dioxide is the largest target of Kyoto and the clean development mechanism, methane and other gas reduction projects tend to have much better rates of return than those reducing carbon dioxide.

While carbon credits serve as shorthand for emission reduction credits, Kyoto is designed to limit more than carbon dioxide, and indeed other gases make a contribution to global warming that is potentially much greater per tonne. Thus, projects that capture and burn methane, or those that destroy HFC-23 (also known as Trifluoromethane) earn greater numbers of credits than those capturing similar quantities of carbon dioxide.

The destruction of HFC-23, a by-product of the production of HCFC-22, has been the source of credits for the largest private CDM transaction to date. This involved the installation of destruction equipment at a chemical facility run by Zheijiang Juhua in China. The project cost by some accounts as little as \$9.5 million to install, but will generate 29.5 million tonnes in CERs, and at current prices would produce roughly \$450 million in proceeds.

The credits were placed with syndicate members that included Climate Change Capital's Carbon Fund 1 and Carbon Fund 2, Centrica, Deutsche Bank, Morgan Stanley Capital Group, and hedge funds run by Och-Ziff Capital Management Group and Stark Investments. Deutsche Bank provided a guarantee of the payment obligations of the buyers, and Climate Change Capital, advised by Baker & McKenzie, placed the credits.

This private deal is exceptional – HFC-23 is by all accounts not the most common of the greenhouse gases covered by Kyoto. Moreover, there are strict limits on the HFC-23 destruction projects eligible for certification – only those factories brought into service within a small window will be able to generate credits.

Carbon funds frenzy

But the appetite for the credits has been substantial, proving if nothing else that commercial and investment banks, hedge funds and the larger corporates are all confident that the market is robust enough to make multi-year commitments. Carbon trading, which brings together these participants, has already become a component of the London-based trading desks of the main investment banks.

For instance, at the same time as the close of the HFC-23 deal, Climate Change Capital (CCC's) announced the closing of an \$830 million fund, the Carbon Fund 2 that invested in the Zheijiang Juhua credits. Investors in this fund included ABP, the Dutch government and education employee pension fund, and PGGM, the Dutch healthcare workers' pension fund, as well as Centrica.

CCC's first fund, which closed in July 2005, raised roughly \$100 million, and in the intervening period the numbers of participants in carbon markets has expanded considerably. Asia Carbon, a developer of renewables projects, has announced a Eu200 million (\$250 million), eight-year carbon fund. CDC-Ixis and Fortis closed the Eu142.5 million European Carbon Fund with contributions from a broad swath of European banking and insurance: Allianz, Caja Madrid, Citadel equity, CNP Assurances, Dexia, Fondazione CRC, Caisse D'Epargne, Caixa Geral de Depositos, Societe Generale, Unicaja and UniCredit.

Multilaterals have operated funds for several years now – KfW has operated a carbon fund since 2004, and the World Bank has put together several funds, including its latest, an aggregate of its past funds called the umbrella carbon facility. Its purchase of \$1 billion in potential CERs, from two further HFC-23 destruction projects, is to date the largest single CER transaction. Its first fund, the Prototype Carbon Fund, closed in 2000.

The sums raised by the funds, as well as the interest of the investment banks, have tended to create the impression that the carbon trading system is a large and complex way of rewarding investment bankers for measures that should be undertaken by society, and government as a whole. Friends of the Earth UK, for instance, greeted the Zheijiang Juhua deal as "not good or bad news for climate change, but it is good news for traders."

Lucrative and useful

The debate over the wisdom of a carbon trading can resemble that over the merits of PPP – many NGOs, much like opponents of PPP, contend that it is a convoluted and expensive way of dodging politically more difficult decisions.

Regardless of the position that the reader takes on the desirability of a market-based solution to climate change, and the resources that it attracts next to energy efficiency projects, carbon trading is likely to be a vital way for the larger renewables developers and CER consumers to deal with the compliance regime from 2008-12 and beyond.

There is, however, a debate as to how the larger consumers of CERs – the large European, and global chemicals, energy and power producers – can best participate in the market. The motives of these participants tend to vary, according to

the potential that a user of CERs has to generate them from their existing lines of business.

The reputational benefits of involvement in CDM projects can be substantial. Much like the interest of some oil majors and utilities in wind projects, the resources that go into CER-producing benefits can often outweigh their benefits, but make for good PR. In some organisations the expertise necessary to build CDM projects might be present within existing business lines.

For this reason Rhodia, a French chemicals producer, has become one of the largest producers of CERs through its operations in Korea and Brazil. In Korea it has installed equipment to capture nitrogen oxides at Onsan, and it has also installed N₂O capturing equipment at a plant in Brazil. In March, the European Carbon Fund agreed to buy CERs at prices of between Eu12 and Eu15, alongside SG.

According to Philippe Rosier, the CEO of Rhodia Energy Services, the CDM projects grew out of a voluntary emissions project that it completed at a site in France, and subsequently decided to roll out the technology at its sites in countries eligible for CDM certification. "We registered the project at the end of 2005, we were expecting to produce 80 million tonnes of certificates, and we started to look at ways to monetise them," he says.

According to Rosier, Rhodia looked to sell forward some of its CERs, and hedge the price of 10% of the volume. It sold 2.42 million tonnes to the European Carbon Fund in February 2006. Its experience led it to form a new joint venture with SG – named ORBEO – to combine its project development activities and SG's work trading carbon credits. In theory the venture should be able to offer to end users of CERs a greater level of price and volume security. It may in time be able to offer a more complete service to industrials than the carbon funds.

But ORBEO occupies something of a niche even within the nascent carbon finance market. Rhodia's speciality is chemical gas destruction, a complex, if lucrative, corner of the industry, because such gases have warming factors, and thus produce credits at a volume, several times that of carbon destruction or offset projects. And competition for the venture comes from investment banks such as Merrill Lynch, Morgan Stanley and Credit Suisse, all of which have completed carbon trades and have extensive energy trading operations.

Volume controls?

Rosier does not disclose the investment cost of the projects that it hopes to install for third parties, or the likely volumes that the venture is aiming at, since such numbers are now trading positions. But he does acknowledge that competition, both for CERs, and from large industrial companies installing reduction equipment, is growing quickly. Says Rosier, "we now have daily volumes averaging 4-6 million tonnes. This is significant liquidity only a year and a half in, and has reached levels that it took the historical markets such as the sulphur dioxide market in the US, much longer to achieve."

The carbon market has not been without its setbacks, chief among them the drop in prices that took place after several European governments reported emissions levels that were comfortably within the targets they had set themselves. However, the market has since recovered, and the experience is likely to assist governments that participate in the EU emissions trading scheme in setting caps for the National Allocation Plans 2 (NAPs2) period from 2008-12.

But the temporary nature of the arrangements makes it difficult for utilities and power producers to hedge their CER requirements. There are trading desks and funds that are be willing to offer price ceilings for up to two years. They will even do this for special purpose vehicles, such as the holding company used for US Energy Systems' purchase of the Knapton power project earlier this year (search 'Knapton' at www.projectfinancemagazine.com for more details).

Aside from Knapton, there has been a limited number of project financings where the compliance burden has been an issue. One banker puts it bluntly: "we will not accept market risk on the price of buying emissions credits. Wherever possible we will expect the offtaker to take on this risk, by passing on the cost of compliance to the end user." Some governments have been willing to juggle emissions allowances to favour sectors where it wants to encourage capacity development. The German government had suggested that it might provide the necessary carbon credits to the developers of new coal capacity, but an outcry from NGOs has forced it to reconsider this policy.

The question for large consumers, however, is whether they should rely on financial counterparties and funds to source their expected emissions reduction credit requirements. In the long term, as Laurent Segalen, a director in the investment funds group at IXIS-CDC, and the manager of the European Carbon Fund, puts it, "will it really be worth it for a conventional power developer to commit the time and resources to the small methane capture projects in emerging markets that make up so much of the CDM?"

Even if developers are able to put together renewable energy projects, be they solar, wind, biomass, geothermal or run-of-river hydro, that qualify for emissions credits, they may need to diversify away from whichever technology they have settled on. The luckiest chemicals producers might be able to take care of their allowances from their own resources, but others, particularly those with carbon offset projects, will find it difficult to amass the requisite credits.

In-house or outsourced?

But at present there is a crude calculus at play, which says that the image benefits from engaging in carbon capture or offset activity will outweigh the gap between the cost of producing credits in house and buying protection on the open market. Some of the larger developers of CDM projects may even be able to command an acquisition premium because of this.

Irish methane capture developer AgCert for instance, signed an agreement in May with power developer AES to pursue development opportunities in Europe, Asia and North Africa together. AES paid Eu40 million for a 9% stake in AgCert, and says that it will put \$325 million into the joint venture over the next five years. AgCert's last major financing was an initial public offering (IPO) in June 2005, which raised £60 million (\$113 million at today's rates).

But AgCert's decision to join forces with AES surprised many. Its business involves the installation of methane capture technology at farm sites, to reduce the greenhouse gas impact of farm and animal waste. This is a model that depends on developing a large number of small projects, although AgCert usually installs them under agreements with agribusiness concerns that cover multiple sites.

According to Todd Jones, senior vice-president, business development, at AgCert, it decided to join up with AES to use its experience in these regions to expand its operations outside of its main base of operations in Latin America. AES is not a designated buyer of CERs, although it could be a purchaser. Indeed, given that AgCert is essentially contributing its intellectual property to the venture in return for the first 20% of the venture's CERs, AgCert sees much more certainty in credit supply, in return for a lower capital contribution, than AES.

AgCert was rumoured to have been in the market for a bank facility of \$200 million, and several New York bankers expressed enthusiasm for the idea, although nothing ever resulted from this. The AES cash has obviated the need for such a debt facility, although AgCert has raised debt before now, and according to Jones it will not need to perform another major financing before 2008.

But AES does have a strong background in emissions trading – it has been active in installing flue-gas desulphurisation technology at its Eastern European and US plants, and has been able to generate emissions allowances from some of its generating fleet. According to its third quarter 2006 results, it was able to use proceeds of CERs to offset higher maintenance costs at its North and Latin American operations.

It should be noted, however, that these CERs have derived from its work on installing emissions control equipment at AES' existing fleet, and its participation in the compliance market, rather than CDM activity. AES has not so far responded to a request for comment on its CDM activities.

But according to Dana Younger, a senior adviser on renewable energy and sustainability in the infrastructure department at the International Finance Corporation, the larger electricity generation and distribution concerns are looking to take some of this function in-house. "We're now seeing past buyers of credits looking to do this. This makes sense from a strategic corporate perspective, although the offset credit revenue attached to most renewable energy projects at current carbon prices is still not high enough to add more than 200-250bp or so to a project's IRR."

Nevertheless, the IFC has financed a growing number of projects where CERs generated by an officially recognized CDM project represent a small proportion of revenues, and has made equity investments in carbon credit developers such as AgCert. Its first CDM project was the 43MW El Canada run-of-river hydro project in Guatemala with Enel Latin America, for which it provided a \$15 million A loan, and facilitated a \$22 million B loan. Its largest to date has been the 192MW Allain Duhangan run-of-river hydro project in India, for which it provided \$47 million in debt and equity. In each of these cases the sponsors chose to sell their CERs to a World Bank-managed carbon fund. IFC also manages other carbon finance facilities and, according to Younger, is beginning to use its own balance sheet to facilitate further growth in this market.

But while the IFC has been a supporter of the larger-scale projects, the smaller ones have typically relied on prepay transactions, in which the buyer of the credits, frequently a fund, will advance some cash upfront, usually in return for a security interest in the moveable equipment that the prepay funds. This arrangement, which eliminates much of the more extended due diligence process, will continue to be the mainstay of smaller developers.

Where the banks can roam

So while banks have not been willing to lend directly against CDM revenue streams, they have become active in providing credit support for buyers and, less frequently, sellers. The World Bank's carbon facilities typically require that buyers post letters of credit to support their purchase contracts, a relatively low-risk line of business, since most buyers are large and well capitalised corporates.

Some institutions have expressed an interest in wrapping the risk that a project will meet its obligations under a sale agreement. Of these, Swiss Re is understood to be the most active market participant. Such products do not tend to carry the multi-year project risk that would be attached to a loan, although they still require some serious due diligence into a project's compliance with the rules governing whether a project has produced the required emission reduction, and whether it stays in compliance.

Some bankers familiar with the market have also suggested that emerging markets banks might be more willing to lend to projects that produce CDMs than international ones. The evidence for this, however, is fairly scant, since many of the projects in question, especially wind projects with power sales to local utilities, feature credit profiles that would be broadly acceptable to these lenders without CDM revenues.

Probably more important to both domestic and offshore lenders will be the attitude of host governments towards CDM revenues. These diverge wildly, especially on the subject of tax. China's attitude towards CDM revenue is to tax it like any other earnings. Brazil, which subsidises renewable energy development through the PROINFA programme, takes the view that it has the chief claim on carbon credit revenues, at least those produced by projects developed under PROINFA, a category that includes wind farms, but not, say, AgCert's methane capture portfolio.

This last illustrates the caveat that should be attached to almost every discussion of the role of carbon finance in project development – that government actions have a huge part to play in the rules for buyers and sellers both from 2012, when the Kyoto framework expires, and in 2008, when governments start their allocations under NAPs2.

While there is wide agreement that some kind of emissions framework, quite probably a drastic one, should survive 2012, there is much less consensus as to how governments should interpret their obligations beyond this date. So far, the World Bank, which has been far out on front of the private sector in its adoption of carbon finance, has been the only institution to contract for credits beyond 2012. To take a bet on prices beyond this, even if contracting at a strike price far below any theoretical floor, is a bet so far that even hedge funds do not wish to take.

The US: Outside Kyoto, but something to contribute

The United States, the world's largest single producer of greenhouse gases, repudiated the Kyoto treaty in 2001. The Bush administration's position, among its earliest indications that it would pursue a unilateral approach to foreign affairs,

shows no sign of reversing. That the US is the birthplace of cap-and-trade emissions credit systems is rarely remarked.

The US has enjoyed great success at reducing sulphur dioxide emissions, under a system that was established in 1990 and enforced from 1995. Moreover, the US has probably the most extensive experience of carbon sequestration, albeit as an adjunct to the oil extraction industry. Carbon dioxide can be used to maintain oil field pressure, and has been certified as a valid carbon emission reduction technology.

Blue Source, a six year-old developer of carbon infrastructure, hopes that the developing market for carbon credits will enhance its business of transporting carbon dioxide. According to Blue Source's CEO and founder, Bill Thompson, it is sitting on a sizeable inventory of 300 million carbon credits, and hopes to market these to customers in the US that require CERs under voluntary or stat-level emissions caps.

The most promising aspect of the new business is that Blue Source can transport carbon dioxide trapped at the new generation of coal-fired plants in the western US to marginal onshore oil and gas fields located in the same region of the US. Wyoming, for instance, is home to both much of the Powder River Basin coal reserves as well as sizeable gas reserves. "Wyoming will be a big focus of development, although we have also been active in the Permian Basin of Texas," says Thompson. Adds his colleague Russell Martin, recently hired from Kinder Morgan as an executive vice-president, "there are going to be 150 coal plants permitted or under construction. Most of those will use pulverised coal, and would be good candidates for this technology."

First Reserve, a Texas-based private equity fund with interest in oil and gas and oil services projects, recently bought a 50% interest in Blue Source, and is now planning on investing equity through its First Reserve Fund X into the developer's carbon capture projects. These projects would then raise conventional project debt, probably on the back of contracts to deliver carbon dioxide to oil and gas field operators.

For First Reserve, though, the equity interest holds out the promise of creating offsets for assets elsewhere in the fund's portfolio. According to Glenn Payne, a vice-president at First Reserve, "there's a strong likelihood that Blue Source will work with at least one of our portfolio companies. We're interested in the ability to create offsets and also learn something – there can be a first mover advantage in the process."

For Thompson, while the carbon credits are a useful and important new business platform, developing the projects involves traditional project finance discipline of putting in place back-to-back supply and offtake contracts and getting in place the necessary construction permits and contracts. But CERs' importance is increasing, according to Thompson. "When we started in 1997, the price was less than 50 cents, and credits now fetch between \$2 and \$5 each. Carbon is now a double-digit percentage share of our revenue."

For Blue Source, global carbon markets will converge, and it claims to be able to bridge Kyoto and non-Kyoto markets. If this can be done within the current framework of US exceptionalism, then Blue Source could become a powerful intermediary in its own right. Thompson says that while management has built up a decent track record in bilateral sales to end users, it has also worked with intermediaries such as Natsource in structuring sales.

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