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# Environmental Finance

## Who should finance CCS?

10 September 2013

The NER300 mechanism within the EU Emissions Trading System has failed in its intended goal of financing carbon capture and storage. It would be better to put the obligation on fossil fuel suppliers rather than the power generators, says **Ian Temperton**

If you visit the part of Belfast where the Titanic was built, canny store-holders will sell you a T-shirt carrying the slogan "*She was alright when she left here*".

When people mention the NER300, the process that allocated a 'new entrants' reserve' of 300 million EU allowances (EUAs) to fund carbon capture and storage (CCS), and other projects, we at [Climate Change Capital](#) have a similar feeling.



The Sleipner gas fields in the North Sea where Statoil successfully captures and stores carbon (Photo - Statoil)

After months of analysis, the concept of using EUAs for CCS was relatively simple when it left us. It went like this: take some EUAs out of the system and reserve them for supporting CCS. Allocate those additional EUAs based on the tonnes of carbon dioxide (CO<sub>2</sub>) stored by CCS projects in the future. We were targeting 12 European projects at the time, but many of us thought that six would do nicely. If each project had a capacity of 400MW, then it would potentially emit, and hence store, about 2.5Mt of CO<sub>2</sub> a year. Assume that they needed probably two EUAs per tonne of CO<sub>2</sub> based on the price at the time (high-teens and heading north!) for the 20 years of its operating life.

$2.5\text{Mt} \times 6 \text{ projects} \times 20 \text{ years} \times 2 \text{ EUAs} = 600 \text{ million EUAs}$ . Simple.

But nothing is simple, of course. In the inevitable compromises that it takes to get a scheme like this through, we eventually got half what we asked for (the 300 million EUAs) and it had to be shared with other clean energy technologies. Furthermore, the rules for allocation involved the support being spread too thinly, through an extremely bureaucratic process, which relied entirely on the support of EU Member States to make any project viable. One of the reasons for using EUAs in the first place, however, had been to avoid seeking Member State fiscal support.

Storage is a relatively cheap part of the whole project, but is the source of a disproportionate amount of the risk

Add in the catastrophic collapse of the EU carbon price, and the NER300 has become effectively worthless as a CCS support mechanism and, despite massive investment in other clean energy

sources and aggressive emissions reduction aspirations, Europe burns increasing amounts of coal, without having the technology to deal with its emissions.

### **Our little secret**

Now for a little secret. Even if we had got enough EUAs, there hadn't been silly allocation rules, there was no bureaucracy and the EUA price had remained strong, with hindsight we now know this support mechanism would have failed anyway. This is to do with the financing and business model for CCS.

Firstly, CCS requires a combination of skills and assets which no individual company has. It is a power station attached to a chemical factory, connected to an oil or gas reservoir (or some other geological structure) and there simply aren't companies in Europe with the expertise and asset base across these three areas. Hence CCS is about making new companies, or combinations of companies, if it is to be successful.

Secondly, it is extremely capital intensive. These new companies, or combinations of companies, will need to have the organisation and financial resources to deliver projects which cost billions of euros.

Thirdly, the expensive bit is not the risky bit. The power station and chemical factory (the CO<sub>2</sub> production and separation, respectively) are the expensive parts of CCS but they rely on relatively well-established technologies and can be engineered to a high level relatively cost effectively. Storage is a relatively cheap part of the whole project, but is the source of a disproportionate amount of the risk (leakage etc) and can be extremely expensive to engineer to a satisfactory level of confidence.

Quite rightly, to date, the focus of climate policy in Europe has been to put the obligation to deal with emissions onto the emitting entity. This is how the EU Emissions Trading System (EU ETS) works. However, this means the focus has been on the power generators to deal with their emissions and hence to develop CCS.

We have chosen the wrong agent of investment.

Europe's power utilities have had a torrid time in recent years. They are selling assets, cutting costs, and struggling to fund investments in much simpler and better established parts of the sector than CCS.

Even if the economics were right, and the NER300 had provided sufficient funds, it is hard to believe that we would see any utility CEO explaining to investors that they were about to invest billions of euros in what appears to be a new technology, in which they have at best a third or so of the necessary skill-set, and by far the greatest risk lies in an area they know close to nothing about.

### **An upstream CCS obligation**

The new idea in town is an upstream CCS obligation. This is an attempt to replenish the coffers for CCS support; avoid some of the failings of the NER300; and, most importantly, change the agent of investment by changing the focus of the obligation from downstream (the power generator) to upstream (the fossil fuel supplier).

The idea is simple. If you supply fossil fuels to Europe then you would need also to deliver a quantity of certificates that prove you have permanently stored CO<sub>2</sub> equivalent to a certain



Ian Temperton, Climate Change Capital:  
"NER300 has become effectively worthless as a  
CCS support mechanism"

proportion of the emissions that your fuel will create.

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Fossil fuel suppliers generally have more experience than power utilities in delivering large-scale multi-disciplinary projects

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Such CCS certificates would have a value sufficient to support the deployment of CCS and this scheme could therefore replace the NER300 in terms of its funding function. More importantly, from a business model and financing perspective, it shifts the focus of the obligation to fossil fuel suppliers, which has three advantages.

Firstly, they are more likely to have the money to fund the investment in CCS and, if nothing else, it expands the investment pool beyond the European utilities, which is essential for all the reasons discussed above.

Secondly, fuel suppliers have the best chance of understanding the risky bit. Hydrocarbon companies own the rights to many of the potential CCS storage structures, like emptying gas fields, and they have the skills and competencies to understand what goes on underground. Thirdly, they generally have more experience than the utilities at delivering large-scale multi-disciplinary projects which span the three sectors that are needed for CCS.

### **Lessons from elsewhere**

CCS happens where hydrocarbon companies are required to make it happen. Otherwise, it doesn't. This requirement might come from tax, regulation or reputational concerns, or where companies have an economic incentive to do it related to their core business (usually enhanced oil recovery).

Examples include gas fields such as Sleipner (Norway), Gorgon (Australia), and In Salah (Algeria) and CCS projects in the US which largely provide CO<sub>2</sub> for enhanced oil recovery. These projects were made to happen by taxes on production, making CCS an explicit or implicit part of the 'licence to operate', incentives to clean up the carbon footprint of hydrocarbons, and/or the potential to enhance upstream operations through the use of CO<sub>2</sub> for enhanced oil recovery.

There are those who will say that, in a perfect market, European utilities ought to be able to pass on the obligation they currently have under the EU ETS to other more appropriate agents of investment without there being a change to the way we approach things. This is nonsense, at least while CCS is such a nascent industry.

For something this complex and capital intensive, it is essential to align the skills of the right agent of investment with the incentive or obligation to deal with the problem. The practical evidence of this in the specific field of CCS is overwhelming.

### **Two birds with one stone**

Probably the biggest hurdle for any such new system is that it is new. Do we really need to add to the plethora of support and subsidy regimes implemented in the name of climate change? The answer from Climate Change Capital generally is 'no' but, specifically in the case of CCS, 'yes'.

However, any new scheme does need a pathway to integrate back into a simpler and more technology-neutral system over time (preferably the EU ETS). The original idea in using EUAs was that the multiple of EUAs for each tonne stored would reduce over time and eventually CCS would be viable under the EU ETS alone, which must surely remain the objective for any new system.

So how would this new system work?

We generally measure hydrocarbon use through the duty system, so this is the obvious place to check that hydrocarbons come with sufficient CCS certificates. There would be no need to measure anything twice. Simply tell some competent authority how much hydrocarbon fuel you have delivered through the duty system and provide sufficient CCS certificates along with that submission.

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The problem with grant-based systems ... is that companies work to win the bid, not to develop the project

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Two thornier questions are: what sets the price of CCS certificates and what is the penalty for non-compliance? The latter point is particularly pertinent as obligated parties will say that there is no guarantee that CCS will be viable as a technology or that they will be able to deliver projects on time, given all the third party issues that will have to be dealt with in developing a CCS project. These are fair points.

Our recommendation would be to not be too clever about price setting. There is no perfect market in CCS projects, and such projects are the end game here. It would be best simply to set the price of a CCS certificate administratively and one benefit of the NER300 bureaucracy is that we now have a bunch of bids which can inform that decision. We would suggest that it would then need to rise for a period, so people knew it was serious and to give an incentive to develop projects, but there would need to be a long-term trajectory heading towards convergence with the cost of other low-carbon energy sources.

Now, what do you do if you have an obligation and you haven't sequestered the required amount of CO<sub>2</sub>? Our proposal would be that you have to buy and retire EUAs to the value of the CCS certificates which you have failed to produce. So, if the certificate price is set at €100/tonne CO<sub>2</sub> initially and the EUA price was €10/tonne (I wish!) then, if you hadn't physically sequestered a tonne of CO<sub>2</sub> you would have to go out and buy and retire 10 EUAs in order to comply with your CCS obligation.

This has a number of advantages. Firstly, it limits the administrative cost of the new system. Getting access to the EUA market is not hard and requires no new infrastructure. Secondly, it means that if people fail to develop physical CCS solutions then the consequence is a removal of EUAs from the EU ETS which would tighten the emissions market and provide a greater incentive for other forms of carbon saving. Thirdly, we have to do something about the over-supply of EUAs anyway, and this will give EU ETS obligated parties such as the power generators a further incentive to pay attention when the hydrocarbon suppliers come knocking on their door wanting to sequester their CO<sub>2</sub> in order to generate their required CCS certificates.

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You would, of course, be able to trade CCS certificates, so that hydrocarbon companies could find an economic way to sort out among themselves how to satisfy their obligations without each needing to develop their own physical project. You might allow banking between years and the obligation to sequester would clearly need to go up over time. These are all familiar concepts in the design of these sorts of systems.

Another key point about an obligation-style system is that the obligated parties know what is expected of them ahead of time and can plan accordingly. The problem with grant-based systems (which is what the NER300 became) is that companies work to win the bid, not to develop the project. When this is applied to first-of-a-kind projects, this means that companies under-invest ahead of the bid, and then have a strong chance of failing to deliver later.

### **Worth a go?**

Let's be clear, we would all prefer not to keep inventing new forms of support, particularly, as we know all too well, after immense effort you might not end up with what you needed, and even if you do, it might not work. However, everyone in the climate change community knows we need an answer to emissions from hydrocarbon combustion at large point sources if we are to stand any chance of averting dangerous climate change.

If CCS is truly not viable then we have a much bigger problem and we need to know that soon. To date, it has not been CCS itself which has not proved viable, it is the incentive arrangements and the business model which have failed, not the technology.

This time we have to get both those things right, so we can finally see what the technology can do and at what cost.

It is worth another go.

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