consultancy engineering business environment

Carbon markets

An introduction to carbon pricing

An ACE publication

March 2011

Association for Consultancy and Engineering Alliance House 12 Caxton Street London SW1H 0QL
T: 020 7222 6557 **F:** 020 7990 9202 consult@acenet.co.uk www.acenet.co.uk

Carbon pricing and carbon markets

Carbon pricing and the investment decision

Currently there is a ‘reasonable’ chance that the UK will suffer an energy deficit in the coming decade. Ofgem recently has taken positive steps towards the possible resolution of this issue. Given the urgency and potential negative impacts that blackout and poor supply continuity would create it is felt that these issues should be elevated within central government.

Ultimately if action is not taken to ensure the energy infrastructure in the UK is of sufficient quality, investor confidence within the manufacturing, construction and engineering sectors is likely to suffer.

However, within this is the need for the UK to meet its carbon reduction commitments of a 20% reduction by 2020, and 80% by 2050. One of the mechanisms being used to achieve these goals is that of carbon pricing.

The energy infrastructure challenge

Whilst it is accepted that the UK needs to build upon its green credentials it must also be recognised that what industry is potentially going to suffer is a loss of base load power. This unfortunately cannot be provided by intermittent forms of renewable energy (such as wind farms). The UK needs to outline the energy mix it wishes to pursue over the coming decade to provide investor confidence.

Renewable energy may be able to play a significant role within this capacity; however this is going to require addition investment in grid capacities and interconnection to allow a greater degree of flexibility within the system to transfer capacity between areas.

Taking one of the more extreme scenarios, let us imagine the UK were to expand its green technologies so that 50% capacity is in the form of wind farms. Now given the UK’s limited geographical size, this could result in large fluctuations in electricity production.

Given that there are unlikely to be significant areas of the UK that would not be exposed to such weather conditions, the UK would place excessive pressure upon its current grid infrastructure (given that, currently, electricity storage on a large scale is impractical). However with sufficient infrastructure, interconnection and transparency of data across Europe it would be possible to increase this geographical footprint to the point whereby any excess production from

renewable sources could be transmitted to another EU location where there is an energy shortage. This is the development of a truly green European smart grid.

Obviously there are some significant assumptions in such a scenario. The first is that large scale energy storage remains impractical but given the advances in battery/cell technology, this may not be the case in ten years. Secondly, it is accepted that given current technology the transmission of electricity across a pan European grid would create a degree of wastage.

In the UK our main dilemmas are those of practicality, planning, cost, and time. Given that an EU smart grid would not be operational before a significant amount of the UK generation capacity reaches life-expiry the above solution is impractical at best. Under such a scenario the UK would still have to maintain a number of backup power stations, which may be required to provide marginal power when supply shortages occur due to the inevitable intermittency of some renewable sources.

What this suggests is that the UK has to plan its infrastructure around a number of policy options and not become over reliant on any one form of production. Within this we are going to have to account for several possible implications of the green revolution. If the UK were to concentrate its carbon reduction efforts on a transition to electric vehicles our electricity requirements would increase significantly. This will have to be accounted for within our energy mix. There is little point in everyone buying an electric car to save on emissions if we have to open five coal plants to power them. Other technologies such as hydrogen cell powered vehicles may provide a better alternative, but currently there is also little infrastructure to support such technology.

Policies such as carbon pricing have been conceived to try and address these issues, encouraging investment in all forms of ‘clean’ energy production, whilst facilitating efficient private investment in the areas of greatest need across the energy sector.

EU Emissions Trading System (ETS)

The EU Emissions Trading System (ETS) was the first emissions trading system to be set up, and is considered a major part of EU energy policy. The way in which it does this is by allocating companies that fall into predefined eligibility criteria an agreed number of allowances to emit carbon dioxide. These allowances are initially free but over time are moved across to a system under which they are auctioned. Companies subsequently have to buy the number of allowances required to perform their day to day business.

The number of allowances is then also subsequently cut each year. For example, in phase 3 (starting 2012) participants are required to make a 1.74% reduction each year (amounting to a total reduction of 21% by 2020).

The system is designed in such a way that it is meant to replicate the supply and demand conditions of competitive markets. When a company is required to buy allowances it will go to the market and, based on the number of allowances available, the price will vary.

This market is still relatively young and new companies and industries are being included in the scheme during each round.

In actual fact, the carbon market is completely artificial, in that if the regulatory framework was removed the market theoretically no longer exists as parties would no longer have any incentive to continue with the scheme.

Potential vs. outcomes

This section is designed to generate debate regarding the EU carbon market, its effectiveness to promote both conventional and green investment and its current suitability for the UK.

The carbon market has been operating since 2005. How effective has it been at generating investment?

The actual level of investment attributable to the carbon scheme is difficult to assess given it volatile past.

Phase 1 of the carbon scheme (2005-2008) the carbon price effectively hit zero when it was revealed that the European Commission had allocated too many allowances to companies within the scheme.

Why has the carbon price fallen during phase 2?

Phase 2 (2008-2012) started relatively well with carbon prices around 30€/t. However, the recession and tightening of the financial markets has resulted in reduced levels of demand across the economy. This has subsequently meant that the carbon price has gradually declined to its current level of approximately 13 €/t.

Lower demand has resulted in companies reducing their output, which will also reduce the number of permits they require. For this reason there are an excess number of permits, and so the price has fallen.

Why is the carbon market now an issue?

The carbon market itself is not the issue; it is the current lack of investment incentive it provides. At its current price of approximately 13 €/t it does not place a high enough additional cost on inefficient technologies and so there is little incentive to invest in cleaner alternatives. When combined with the restricted availability of credit and capital that has arisen from the banking crisis, policy makers are beginning to worry.

There are suggestions of the UK implementing a minimum price would this work?

The Environmental Audit Committee has called for a minimum carbon price of at least €100 (£88) per tonne[1].

A minimum carbon price may have some positive impact because it should help to address uncertainty within the carbon market for investors. By guaranteeing that a minimum cost is going to be incurred by businesses there will be more incentive to invest. However, this will not eliminate all uncertainty. There is still some degree of policy uncertainty concerning the exact details of phase 3, and there is still the possibility of the EU tightening its emissions targets.

The problem is, where would one set the minimum price? What price level would be required to reduce reliance on fossil based generation and facilitate renewables investment?

This is a very good question. Industry estimates vary from 40-70€/t, and whilst the Environmental Audit Commission has asked for a minimum price of €100 €/t, it is important to remember that the carbon price has never broken 40€/t.

[1] Financial Times – Carbon Markets Failing – say british MPs, (February 2010), http://www.ft.com/cms/s/0/d89b64ee-1452-11df-8847-00144feab49a.html

Per Lekander of UBS wrote an interesting article entitled “Uncertain Outlook for EU Carbon Price[2]” outlining the complexities of carbon pricing.

Further complexities also exist because the ETS scheme is EU-wide, and therefore a minimum price would be best applied at an EU-wide level. However, the EC may not endorse such measures and so the UK may have to impose its own minimum price.

Would investor confidence return in phase 3 given that emissions allowances will be cut further?

Looking forward, the EC has set out to reduce allowances and create additional incentives for investment within the third phase of ETS. Firstly, the cap will reduce annually by 1.74% of the annual total phase 2 cap, amounting to a total reduction of 21% by 2020.

Secondly, companies will have their use of Certified Emission Reductions (CERs) limited to 50%. Currently it is estimated that 80-90% of companies reductions are achieved using CERs. The idea behind the 50% cap is that it will make companies invest and achieve savings within the EU.

The EC has also announced that it will make available €300 million in allowances for the demonstration of 12 carbon capture and storage projects. At current prices, this probably would not provide sufficient incentive to invest in such experimental technology.

Is the UK alone in this issue?

This situation is not unique to the UK. Currently, Europe is to move towards ‘regional’ hubs and markets, with the ultimate goal of having a harmonised EU energy market. In this case instead of an investment bank, the Third Package has set out guidelines for the establishment of the Agency for the Cooperation of Energy Regulators (ACER), which will have an advisory role on regional and EU issues. The idea is that ACER would direct investment towards the resolution of cross border issues and the EU’s overall energy mix, creating an EU-wide market instead of 27 individual ones.

[2] APX, Energy Viewpoints Issue 16 - Uncertain Outlook for EU Carbon Price (2008)

Other carbon policies in the UK

Carbon tax

A straight forward carbon tax could be applied, under which, for every tonne of CO_2 produced a company pays a specified charge to the government to offset the impact of CO_2 emissions

The advantages of a flat rate tax on carbon is that companies are aware of their tax commitment, ensuring a degree of financial certainty, and the flat rate is applied equally across all companies regardless of income.

The main criticism of such a tax mechanism is that it does not account for movements in the market prices and so is set according to politics rather than economics. Also such mechanisms are felt to disproportionately impact on smaller scale manufacturing.

Climate Change Levy (UK)

The Climate Change Levy (CCL) was introduced in the UK in April 2001, with the aim of encouraging businesses to improve their energy efficiency and reduce their carbon footprint. As a general rule of thumb the CCL currently applies to "industrial and commercial energy supplies to the industrial, commercial, agricultural, public and service sectors[3]."

The current CCL rates can be found on HM Revenue and Customs website[4]

Electricity generated from renewables and approved environmentally friendly scheme are not included within the CCL.

As part of the CCL, companies can agree to sign a Climate Change Agreement (CCA) which binds them to a set number of targets to reduce carbon emissions and improve energy efficiency. This entitles them to a discount of 80% from the CCL.

Subsidisation

Subsidising clean technologies given the complexities already examined within the carbon market may create a more efficient outcome, given that it would spur entrepreneurial behaviour within the sector.

---

[3] DECC - Tackling climate change, http://www.decc.gov.uk/en/content/cms/what_we_do/change_energy/tackling_clima/ccas/cc_levy/cc_levy.aspx

[4] HM Revenue and Customs, Climate Change Levy – introduction

However, ironically, because of the existence of a carbon market, undertaking such activity may cause further economic inefficiency. If the current low carbon price rises after subsidies have been put in place there is the potential for super normal profits to be made within the green industry.

Although economically inefficient subsidies may provide the additional incentive to invest given the potential generation gap faced in the UK and across Europe.

If subsidies were to be used on a wider basis it would be important to encourage growth within the industry in a manner that does not end once the subsidy is withdrawn. Creating a mechanism and the rules to for such a system will require a detailed understanding of current market conditions, potential future demands and technology developments, as well as the investment process.

Demand efficiency

The supply of energy is not the only area that is going to receive investment. Smart meters are due to be installed in every UK household to help customers measure energy usage and react accordingly to maximise energy efficiency and lower their energy bills.

Whilst any moves to aid businesses and households to save energy are useful, ultimately the energy saving on its own is not going to solve the potential shortage in generation capacity.