Costing for carbon

Industrialised nations are considering cap-and-trade carbon schemes that could introduce a range of potential costs and benefits for the mining industry

UNLIKE a simple carbon tax, cap-and-trade schemes allow the authorities to set economy-wide limits to carbon emissions and let producers trade emissions rights.

With carbon taxes there are no limits placed on the quantity of carbon emissions – carbon emitting behaviour just becomes more expensive, thereby encouraging emitters to find ways to avoid or minimise their carbon tax liabilities.

Cap-and-trade schemes limit the quantity of carbon emitted and allow market mechanisms to price the cost of emissions reduction. Emitters that find the cost of reducing emissions is higher than the market price of emissions rights (say coal-fired power stations) will have to buy emissions rights to keep emitting.

Conversely, emitters that can cut their emissions more cheaply than the market price of emission rights can sell their permits in the market. Both approaches result in an explicit money cost attached to carbon emissions.

IMPLEMENTATION IN EUROPE

The European Union (EU) is one of the most advanced jurisdictions in the implementation of a carbon-reduction scheme, having launched its Emission Trading Scheme (ETS) in 2005.

The legislation is the largest multi-country, multi-sector greenhouse-gas-emission trading system world-wide and has become the cornerstone of the EU's strategy for fighting climate change.

Following the initial two trading periods since the introduction of the ETS in 2005 (2005-2007 and 2008-2012), the scheme is currently under revision for the third ETS trading period, starting in 2013.

In its first phase, the EST included some 12,000 installations, representing approximately 40% of EU CO_2 emissions. It covered energy activities (for example coal-fired power stations), the production and processing of ferrous metals, the minerals industry, and pulp, paper and board activities.

The EST has since been expanded to include other sectors, for example, aviation (although this will not take effect until 2012) but, ultimately, the European Commission aims for the post-t2012 ETS to include all greenhouse gases and all sectors.

The first carbon-trading period established free trading of emission allowances across the EU, as well as the necessary infrastructure to do so, and developed a dynamic carbon market. But the first two trading periods also showed that differing national methods for allocating allowances to installations threatened a fair competition in the internal market.

Changes due to be implemented include extending the scope of the ETS Directive to include other greenhouse gases (nitrous oxide and perfluorocarbons), many more industrial sectors and provisions for CO_2 capture and geological storage.

The revisions will introduce an EU-wide single cap and will no longer allow national allocation plans in the member states, which has been the case up to now.

In order to achieve further harmony across the EU, auctioning will become the basic principle for allocation of EST permits.

It has been estimated that the revenues from the auctioning of allowances will amount to at least €33 billion (US$44.7 billion) per year.

Member states have been advised to increase the share of this revenue used to fight and adapt to climate change (both within the EU and in developing countries) from 20% to 50%.

These funds will be used for increased research and development, technical improvements, energy conservation and efficiency measures.

Meanwhile, a further 300 million allowances from the new-entrants reserve will be used to support up to 12 carbon capture and storage demonstration projects.

The ETS has not been wholly successful however, and a risk of carbon leakage (relocation of businesses to less costly jurisdictions that are not implementing ETS schemes) was identified in 2009 as an area to be addressed.

Industry sectors (such as steel production) have been deemed to be at serious risk of carbon leakage if production costs increase by at least 5% at the same time that trade intensity (the ratio of the total value of imports versus exports) increases by 30%, or if costs increase by 30% or more, or trade intensity increases by 30% or more.

> "Despite the Copenhagen setback, cap-and-trade schemes remain the regulatory method of choice by industrialised countries to control greenhouse-gas emissions"

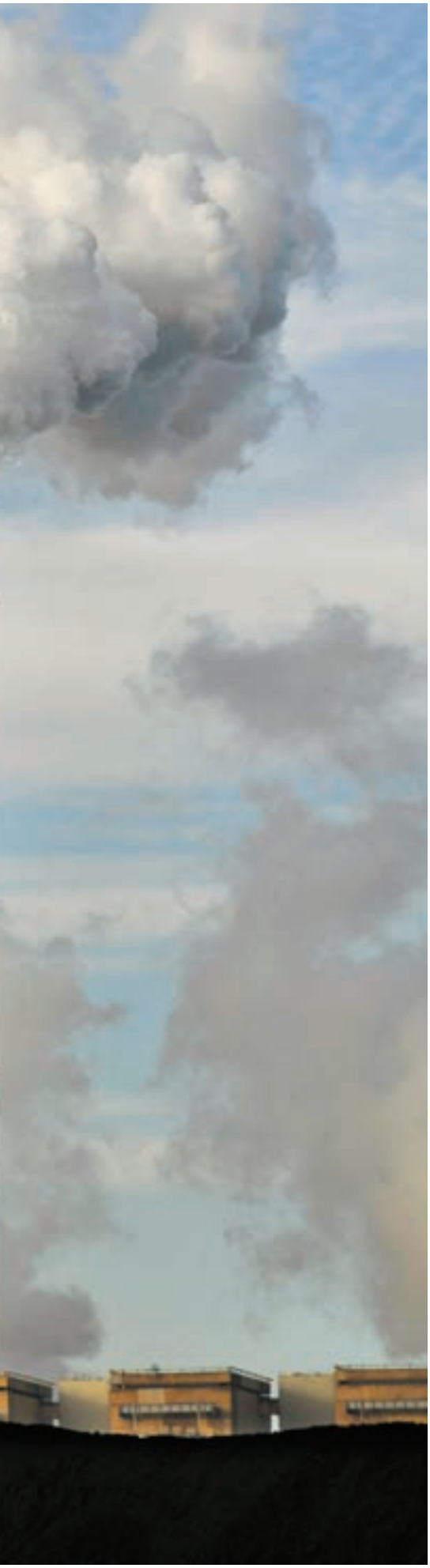
Those sectors that have qualified as being at risk of carbon leakage will be allocated European-wide free allowances, which will be gradually reduced every year until 2020.

The EU will continue to assess the risks of carbon leakage in light of international efforts to reduce greenhouse-gas emissions, and plans to produce an analytical report assessing the situation with regard to energy-intensive sectors deemed at risk by the middle of this year.

Unless climate change policies are truly supported worldwide, however, the current EU scheme could seriously damage small and medium-sized producers, will increase the dependency on imports and will fail to improve the CO_2 balance.

Instead the scheme could only export the issue while costing growth and unemployment, which could have been prevented if some of the measures were designed with more proportionality in mind.

European coal-fired power stations face higjher costs under ETS



COMPARING SYSTEMS

In August 2009, the Minerals Council of Australia published a useful comparison of the Australian CPRS with the Waxman-Markey cap-and-trade scheme presently before the US Congress and the EU emissions trading scheme currently in place.

According to the Minerals Council, the CPRS will cover 75% of Australian greenhouse-gas emissions in 2011 and will rise to 90%-95% after 2015, compared with 45% in the EU and up to 78% in the US by 2015.

Transport and agriculture are excluded from the EU ETS, as are coal mining fugitive emissions in both the EU and the US.

The Australian CPRS also ramps up much faster: 70% of permits will be auctioned at the outset, compared with 15%-18% in the US scheme and only 3% in the first eight years of the EU ETS. The 70% threshold will not be reached in the EU until 2020 and not in the US until 2030.

The Minerals Council also points to the much tougher regime for Australian power generation. While 85% of Australia's electricity generation is coal fired, compared with 48% in the US and 30% in the EU, the Australian CPRS allocates permits to Australian coal-fired generators equal to 13% of emissions for just five years until 2016.

The US will provide permit allocation to coal-fired generators at 50% of emissions for two years and at least 40% until 2025 before being gradually phased out by 2030.

European power generators receive virtually 100% free allocation of permits for the first 8 years of the EU ETS. Even after 2013, certain EU power generators will be able to apply for allocated permits for up to 70% of their emissions.

AUSTRALIA'S VANISHING CARBON SCHEME

Until just a few months ago, Australia looked set to become another early adopter of a cap-and-trade scheme to reduce greenhouse-gas emissions.

The country's Carbon Pollution Reduction Scheme (CPRS) was scheduled to begin in mid-2011, but a failure to reach a global deal at the COP15 meeting in Copenhagen in December, and a newly-invigorated Australian conservative opposition has changed the political landscape in Australia. This will at least delay the Australian legislation to beyond the next election and will in all likelihood result in changes to the scheme.

The latest CPRS legislation was rejected by the Australian Senate (the upper house) in late 2009 on the vote of the conservative opposition parties and the Green party, however, the government proposes to re-introduce the CPRS Bill this month.

To help the legislation through this time, the government has foreshadowed a soft start to the CPRS in 2011, when the carbon permit price will be capped at A$10/t CO_2-e and unlimited permits will be available.

But while the timing seems to be slipping, the intention is that Australia's CPRS will cover most sectors of the economy with the exception of agriculture (which will not be covered before 2015).

As with the EU's ETS, all operations emitting more than 25,000t/y of CO_2-e will be liable to have emission permits under the CPRS.

Free permits will be issued to 'emissions intensive trade exposed' (EITE) businesses in recognition of their probable inability to recover their emissions cost in export markets.

EITE businesses emitting more than 2,000t CO_2-e per A$1 million revenue or 6,000t CO_2-e per A$1 million value added will be entitled to an allocation of up to 90% of their emissions, and allocations of up to 60% will be permitted for EITE businesses emitting between 1,000 and 2,000t CO_2-e per A$1 million revenue or between 3,000t and 5,000t CO_2-e per A$1 million value added.

For activities falling below these levels, no permits will be available since they would not be regarded as emissions intensive under these rules.

Overall, up to 30% of total permits will be issued free to EITE businesses, although the quantity of permits would fall as the cap is reduced. These thresholds will be applied across industry-wide averages, however, which will ensure that no mining activity (apart from coal) will be affected by the EITE provisions. Essentially, this means that the mining industry will not be sufficiently emissions intensive to receive any free permits.

Yet the impact of the CPRS, particularly on mining, is set to be relatively low. Using the Australian Treasury's own emissions projections, new research by the Centre for Population and Urban Research at Monash University concludes that the government's target of a 5% reduction on 2000 levels is "not plausible" under the CPRS. High immigration levels, population growth and the government's refusal to consider nuclear power are inconsistent with the CPRS.

Since over 80% of Australian emissions growth until 2020 is projected to come from population growth, the CPRS as presently structured will require politically unacceptable permit prices to be effective, or the authorities will have to re-think the scheme and the targets.

> "In Australia, the mining industry will not be sufficiently emissions-intensive to receive any free permits from the Carbon Pollution Reduction Scheme"

As of late February, the conservative opposition parties in Australia had adopted a set of ad-hoc policies that they claim will achieve the government's 5% reduction by 2020 target without the need for the CPRS, which it labels as an 'environmental tax scheme'. These claims are not supported by informed opinion but they appear to have struck a chord with the public.

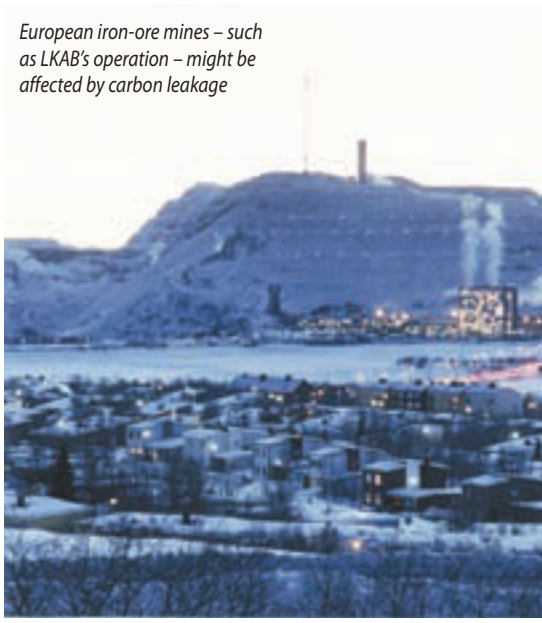
At the same time, the government freely admits that it has failed to sell the CPRS to voters and is now promoting other issues in the lead up to the next Australian general election – due before the end of the year.

US PLAYS CATCH UP

With the change of administration at the start of 2009 the US has been playing catch-up to other developed countries in implementing environmental policy, and in June passed the American Clean Energy and Security Act of 2009 (Waxman-Markey).

With the passage of this legislation by the US House of Representatives, and the introduction of the Clean Energy Job and American Power Act of 2009 (Kerry-Boxer) in the Senate, clear expectations are

The US will encourage the coal industry to invest in carbon capture and storage



European iron-ore mines – such as LKAB's operation – might be affected by carbon leakage

developing regarding the structure of a US cap-and-trade programme.

The cap-and-trade scheme proposed by the act would set mandatory caps on 87% of US greenhouse-gas emissions including electric power and heavy industry, and aims to reduce emissions by 17% on 2005 levels by 2020 and 83% by 2050.

Like the EU, the US recognises that carbon leakage could be a concern, and is planning similar measures to the EU to combat this. These measures include rebates for carbon-intense industries to offset their costs, as well as international negotiations to maintain competition.

The role of offsets in a federal programme will be important and a provision has been made to allow 2,000Mt/y CO_2-e of offsets to be split equally between domestic and international activities. Further assistance will also be provided to EITE industry sectors as seen in the EU and Australia.

PROGRESS ELSEWHERE

Other jurisdictions around the world are also in the process of developing their own carbon-reduction schemes.

In Canada, the federal government has made a clear commitment to reducing greenhouse-gas emissions by passing the federal Climate Change Accountability Act last year.

The act will require incremental cuts in emissions by 25% on 1990 levels by 2020 and 80% by 2050, but the federal strategy for these reductions has yet to be defined. Both a cap-and-trade scheme and a national carbon tax have been proposed by different parties.

Meanwhile, Canadian provinces are in the process of implementing their own reduction schemes. Quebec is set to become the first jurisdiction in North America to implement a cap-and-trade system.

The government of Quebec has unanimously voted to amend the Environmental Quality Act. The amendments will allow the government to set emission ceilings throughout the province, to require that certain emitters compensate for their emissions by purchasing recognised emission allowances and to provide for payment to a 'Green Fund' of amounts collected as part of the greenhouse gas cap-and-trade system.

The scheme should be introduced in the province in 2012.

Ontario also introduced legislation to enable a cap-and-trade scheme last year. In December the Ontario legislature passed the Environmental Protection Amendment Act (Greenhouse-gas Emissions Trading), the foundation for the province's cap-and-trade programme, which will allow the programme to link to other systems in North America and abroad.

This is the first step towards implementation, which could also occur as early as 2012.

Also in December, Bluenext, the international environmental exchange, announced that it was developing China's first standard for voluntary emission-reduction projects, seen by many as the first step towards a Chinese national cap-and-trade system.

Bluenext will be working alongside the government-backed China Beijing Environmental Exchange, and commentators speculate that China may beat the US in implementing its cap-and-trade system.

IMPACT ON MINING

Implementation of these emissions-reduction schemes worldwide could have both costs and benefits for the mining industry.

By far the hardest hit area of the industry will be coal mining, which will incur costs for both the energy used in producing coal and for fugitive emissions from coal mines.

For European coal producers and coal-based energy generators, the ETS will certainly increase costs and, although it will certainly lead to increased efforts and investments into newer and better technology, not all operators will be in the position to remain competitive under these circumstances.

This will speed up some closure plans and lead eventually to more closures of mines and power generators. It will increase, in the medium and longer-term, the EU's dependency on other energy sources and energy imports. This stands in strong contrast to the EU's discussions on supply security in energy, but also other raw materials.

The current proposals to address expected electricity price rises and the increasing costs for CO_2 allowances still threaten those industries that are under serious threat from international competition and could have far reaching consequences for the whole EU economy.

Europe's iron-ore supply and domestic production may also be affected, and is particularly at risk of carbon leakage.

The iron-ore supply to Europe's steel industry is largely dominated by imports from producers around the world that do not have to comply with equivalent ETS schemes.

The few producers in Europe, the largest of which are LKAB Group's Swedish operations, will be subject to ETS and will have to compete with a strong international competition while being subject to increasing costs in CO_2 rights and electricity prices. Furthermore, potential new EU iron-ore projects are threatened by still unpredictable costs due to the new scheme.

The EU magnesia industry, supplying refractory material to the steel sector, is under threat because the process itself, not fuel-related emissions, will not be excluded from the ETS cap. The process produces emissions due to calcination, which are constant and determined by the chemical reaction.

A sector that for decades has been exposed to dumping from China and which has scored highest on the Commission list of 'sectors exposed to risk of carbon leakage', the magnesia industry will be burdened with additional costs which could eventually lead to the closure of several mid-sized operators in Europe and in increase the dependency of Europe's steel industry on one or two European suppliers and imports.

In Australia, coal mining will receive special consideration because the majority of emissions come from fugitive methane and CO_2 emissions released as the coal is mined. Assistance will be available to existing coal mines, with fugitive emissions intensity above a threshold of 0.1t CO_2-e per tonne of saleable coal produced. During a five-year transitional period, assistance will be given to individual coal mines according to their emissions above the threshold.

For emissions-intensive mines, carbon liabilities will be reduced by about 70% from the levels that would otherwise occur.

Special provisions will be also made for coal-fired power generators, which will receive an allocation of up to 13% of free permits over ten years. These permits will be shared among coal-fired generators that have an emissions intensity above 0.86t CO_2-e per megawatt hour generated.

Australian gold miners may also be disadvantaged by the CPRS because they will bear the same emissions control requirements of all other Australian industries, without any benefit from the EITE provisions.

In the US, the gold industry will not be included in the cap-and-trade scheme and gold producers will be eligible for special assistance to compensate for higher power costs. The Canadians are expected to follow the US, while the other major producer countries – Russia, China, South Africa and Peru – have yet to propose carbon penalties or controls.

However, for all this concern, the CPRS will have only a minor effect on the Australian mining industry, with a carbon permit price of US$20/t CO_2-e as implied by the government's 5% reduction by 2020 target.

Emissions from mining activities include onsite mining and milling direct and indirect emissions, plus concentrate transport emissions, plus metallurgical emissions at complexes such as the Mt Isa lead smelter, the Olympic Dam copper smelter and refinery, and the Murrin Murrin and Yabulu nickel plants.

Using 2009 as a bench mark, a US$20/t CO_2-e permit price levied on mine-site activities would add just 1.6c/lb to Australian copper mining costs, 4.1c/lb for nickel, 0.5c/lb for lead and 0.8c/lb for zinc. These exclude metallurgical costs except for operations with co-located

Australian coal mines will receive special consideration

metallurgical plants.

Within the US's Waxman-Markey Bill, provisions have also been made for the coal sector, encouraging research into carbon capture and storage, for example, although the bill has not been unanimously supported by the US mining industry. The National Mining Association says the legislation needs to support realistic timeframes that will not needlessly displace coal (which provides half the nation's electricity) with costlier fuels and maintain the global competitiveness of US industries, including mining, that are energy intensive and trade exposed.

The legislation also provides some opportunities, particularly for the US coal-mining industry.

Until recently, converting the collection and destruction of coal mine methane into a valuable and marketable commodity occurred mainly outside the US.

However, increasing participation, sophistication and liquidity in the US carbon market is making it possible to convert this historical liability into a new source of revenue for North American coal mine owners.

Companies with financial and technical expertise, and capital, are now in place to partner with mine owners to help them evaluate project opportunities, understand the rules, regulations and processes required to maximise the value of such projects, provide capital to finance projects and secure the necessary engineering and other technical expertise to undertake a successful project.

This feature was compiled from contributions by Michael Farrell, a principal of minecost.com, Corina Hebestreit, secretary general of Euromines (the European association of mining industries, metal ores and industrial minerals), and Gregory Arnold, managing partner for CE2 Capital Partners. All photos: Bloomberg News

Emission-intensive mines in Australia will get a 70% saving on liabilities