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Emission Assets: Changing the Competitive Landscape of the European Power Market

Real estate agents refer to "location, location, location" as the key determinant of value for properties in the housing market. European power generators quickly are becoming familiar with a different kind of property value: emission assets. For power generators participating in the European Greenhouse Gas (GHG) Emissions Trading Scheme (to be launched in January 2005), "allocation, allocation, allocation" will be the key to unlocking value to the emission assets.

Drax is the largest coal-fired plant in Western Europe, and produces more than eight percent of all electricity generated in England and Wales.

The "value at stake" for players having to operate under carbon constraints in the European power generation sector is, without question, financially significant. Our analysis illustrates that GHG emissions policy may well be the biggest determinant of power plant asset value in Europe for several years to come—given the concomitant and substantial impacts on wholesale power prices, fuel mix, generation mix, and renewable energy premiums. In an emissions trading system, companies are assigned emission targets and can sell or purchase allowances to help meet their targets. With so much value at stake, power generators can little afford not to analyze the options for permit allocation—a decision which, based on the European Union's principle of subsidiarity, is left to individual Member States.

The introduction of GHG emissions constraints throughout the European Union power sector will add significant extra costs to power generation, increase power prices, accelerate the shift to natural gas, and have dramatic consequences for the commercial viability of existing power stations in the region. In many cases, depending upon the allocation method selected, it will alter the relative competitiveness of specific power plants.

The scale of financial implications for power generators will vary considerably by country because of the differences among countries in how well they are meeting their emissions reduction targets. Regardless of one's country of focus, however, the potential value-at-stake from decisions regarding emissions permit allocations can be calculated from a few simple assumptions.

Let us assume that the United Kingdom decides to use a reference year in which efficient coal plants are running at high load factors and the quantity of emissions permits given covers a high proportion of the output. Both of these seem reasonable given the political affinity towards coal in the UK and the UK's relatively good position in reaching its carbon emission reduction targets.

Running baseload, a coal plant will emit approximately 8,000 tons of carbon dioxide (CO_2) per mega watt (MW) each year. If permits are given to cover 70 percent of emissions, that equals 5,600 tons per MW. An assumed carbon emission permit value of 5 Euros per tonne (at the lower end of market expectations) gives a value for carbon emission permits of 28,000 Euros per MW per year. Put in terms of the Drax power plant, one of the UK's best known plants, that is more than 100 million Euros each year. The minimum period for which permits likely are to be allocated is a pilot period of 2005-2007, followed by a second phase from 2008-2012, and the value of carbon emissions is expected generally to rise through time.

Will the value of carbon emission permits received be offset by the cost of buying permits to cover generation by the plants? No. Power generators and traders are sophisticated enough to see the opportunity cost of carbon emission permits and factor it into the price at which they will sell electricity. This means that the electricity price will rise to offset this extra cost. If the UK market were starting at nearly an equilibrium position, then new gas-fired generation would come onto the system as prices rise, and this would limit the increase (gas-fired plants have lower carbon emissions per unit output than coal). However, with the current excess capacity in the UK market, there is plenty of room for prices to rise before new plants will be competitive with existing coal-fired generation.

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Even without including the value of emission permits received, many power stations in the UK will make more money with carbon emissions trading. This is because the marginal plant on the system is generally less efficient than other operating power plants. As the marginal plant adds its cost of emissions into its bids, the resulting price rise is greater than the additional costs faced by most of the infra-marginal power stations. As prices rise more than costs, profits will increase. The effect will be most evident for nuclear and hydro plants, which will incur no carbon emissions costs. The profit increase for viable plants likely is to be reinforced as carbon emission costs accelerate the closure of marginal capacity—thus, bringing the market back into balance and strengthening wholesale prices. Closure decisions may, however, be affected by the mechanism chosen for permit allocation; if power plants are granted their permits on the condition that they remain operational, this secondary effect will be less pronounced.

The plan for allocating emission permits among affected installations will be set by all Member State Governments before March 2004. The European Commission has the right to reject these plans if they appear to violate competitive principles. There are a range of mechanisms that can be used to decide how many permits the power sector as a whole receives vis-à-vis other sectors and on what basis this is split among the power stations. The system for distributing permits will have a direct effect on the value of power plants through the number of permits they receive. There also may be an indirect effect through ongoing distortions to the power market if receipt of future permits is conditional on future operating patterns. It actually is possible for carbon emissions trading to drive power prices downward if the permit allocation system includes particular features.

In short, the permit allocation mechanism is the critical variable that determines who wins and by how much. Of course, for every winner in the permit allocation contest, there inevitably will be a loser.

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