Submission to the Environmental Audit Committee Inquiry
The role of carbon markets in preventing dangerous climate change

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The EU Emissions Trading Scheme

- **Extent to which the carbon price will be sufficient to drive low carbon investment, in particular decarbonisation of energy**

1. Our analysis suggests that the carbon price is the backbone of climate change policy – and its existence both facilitates some of the transition and enhances the credibility and consistency of complementary climate policy instruments. If we are to decarbonise the power sector, large-scale deployment of renewables must play a central role (Neuhoff, 2007b). Without tailored support schemes in addition to the carbon price, the market is unlikely to choose 'the right' technologies (Neuhoff and Twomey, 2008). Thus tailored support scheme for renewables are required. Our analysis has illustrated the advantage of feed-in type systems over the ROC scheme (Butler and Neuhoff, 2008) – and we have explored how the UK could structure a transition to such a scheme while maintaining investment security and enhancing economic effectiveness (Johnston, Kavali and Neuhoff, 2008). Success will depend not only on the financial support scheme for individual projects, but will require changes to market design, planning and administrative procedures. For low-carbon technologies to succeed and reduce costs, the expectation and confidence of technology companies in the growth of future demand for their technology facilitates investment and enhances innovative activity (Neuhoff, Lossen, Nemet, Sato and Schumacher, 2007, Foxon, Kohler and Neuhoff, 2008, Neuhoff). The European Renewables Directive creates a target and reporting framework to address these concerns, and the long-term expectation in growing demand for new technologies in a carbon constrained world – as formulated with ETS – can further enhance market success.

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- **Impacts on and responses by UK firms covered by the EU ETS**

2. We have pursued surveys across management and investors in the UK and across the EU to better understand the response of private sector investors to carbon EU ETS (Neuhoff, 2007a). We find that one needs to differentiate between investors – and tailor the design of climate policy and EU ETS to match their requirements. Strategic decisions of large corporations and pension funds might be driven by long-term targets and their credibility that can be reinforced with a stringent EU ETS design. The associated uncertainties are too high for technology companies that are more focused on specific policy design for renewable energy. In contrast, project investors are often focusing on the direct impact of the carbon price on the viability of their projects, and are therefore more concerned about short-term volatility and uncertainty associated with the carbon price. We combined and compared several models to illustrate the range of uncertainty of projections for carbon emissions (Neuhoff, Ferrario, Grubb, Gabel and Keats, 2006).
3. The analysis points to three aspects that need to be considered in the design of emission trading. First, a clear and simple framework, preferably with full auctioning, enhances the visibility of the scheme, and reduces uncertainties associated e.g. with future free allowance allocations. Second, the ability of future carbon prices to rise to levels that are necessary to meet future emission reduction targets is important. It enhances the credibility of government policies, and facilities projections of future market shares and opportunities. Price caps or safety valves, in contrast, undermine this visibility and would be difficult to determine given the uncertainties about future coal, gas, oil and technology prices. Also, clear limits on the use of international off-sets are important to create visibility of emission reduction objectives (and technology opportunities) within Europe (Neuhoff, 2008a). Third, given increasing evidence on the carbon price uncertainty and volatility (Grubb, 2008), policy instruments to ensure a price floor can facilitate project investment using bank finance and thus reduce finance cost. This can be achieved with the use of a reserve price in allowance auctions (Hepburn, Grubb, Neuhoff, Matthes and Tse, 2006), or by governments issuing long-term physical option contracts on future carbon prices (Ismer and Neuhoff, 2009).

- **Implications of the EU ETS for business competitiveness, and how to address them**

4. Together with Climate Strategies we convened and pursued extensive studies on the implications of emission trading for European Competitiveness (Grubb and Neuhoff 2006). Given the broad range of aspects that influence the competitiveness of an economy, or more operational, a sector of the economy,

we decided to move to analysis that focuses on leakage effects – defined as the direct impact of unilateral carbon pricing on investment, operational or closure decision of an economy. Detailed quantitative analysis of the sector specific impact across all manufacturing industries in the UK pointed to a narrow set of activities that could potentially be at risk of leakage (Hourcade, Neuhoff, Demailly and Sato, 2008).

5. Several approaches have been proposed to address such leakage concerns. Sectoral agreements received much attention in international discussions, but both their politics and economics make them unlikely candidates to address leakage concerns. Given the sensitivities associated with international discussions on competitiveness, sectoral cooperation might be enhanced if it is not intended to address leakage concerns. (Colombier and Neuhoff, 2008). Free allowance allocation is the second instrument that is argued to be suitable to address leakage concerns. The challenge is, that in order to address leakage concerns, the allocation has to affect investment, operation and closure decisions and thereby distort the carbon price signal and environmental effectiveness. This points to the need of carefully balancing leakage concerns and domestic efficiency (Grubb and Neuhoff, 2006).
6. Direct provision of state aid is a third option to provide support towards investors that face higher carbon costs in Europe than in other parts of the world, and both legal and economic aspects are discussed in detail in Neuhoff and Matthes (2008). The economically efficient approach to address leakage concerns are border adjustment. In Ismer and Neuhoff (2007) we argue how careful implementation can overcome WTO constraints and limit administrative complexity. The political sensitivities of border adjustment are the real barriers for its implementation, and have to be carefully considered and addressed (Neuhoff, 2008b). International cooperation to limit the use of border adjustment (Neuhoff and Ismer, 2008) offers the opportunity to address concerns of developing countries about proliferation or discriminatory application of border adjustments, concerns of the trade community about technical constraints and complicities of inhomogeneous application of border adjustment, and ensures that the use of border adjustment is manageable in political processes in developed countries.

- **Allocation or auctioning of EU ETS credits, and the use of auctioning revenues**

7. With analytic models we have demonstrated the significant distortions that repeated free allocation of allowances creates (Neuhoff, Grubb and Keats, 2005). For the case of the power sector, detailed simulation models point to the cost increases associated with these inefficiencies (Neuhoff, Keats and Sato, 2006). Comparison across the national allocation plans that were

announced for phase II (and subsequently implemented with only small alterations to the allocation methodology) highlights the empirical relevance of the academic concerns (Neuhoff, Rogge, Schleich, Sijm, Tuerk, Kettner, Walker, Ahman, Betz, Cludius, Ferrario, Holmgren, Pal, Grubb and Matthes, (2006). As a result the revisions to the EU Directive envisage full auctioning for the power sector (other than in new member states), and prescribe a harmonised European allocation using benchmarks for other installations. The complications of such benchmarks are discussed in Neuhoff and Matthes (2008) and are likely to fuel much discussion during 2009.

8. The design of auctions, as a more efficient allocation methodology was always clear, and the theoretical literature pointed to the simple design options (Hepburn, Grubb, Neuhoff, Matthes and Tse, 2006). Detailed analysis, based on experience from other sectors and from industry participants, confirmed these assumptions and lead to a simple straw-man for the auction design (Neuhoff, 2007c), that is in line with the approaches that have emerged since. The forthcoming debate will have to focus on approaches to coordinate or integrate auctions across European countries so as to increase simplicity and robustness of the European Emission trading scheme. The use of auction revenues will need to balance the interest of treasuries to balance the debt accrued when bailing out the badly regulated financial sector, with environmental objectives. In addition, with potentially higher carbon prices, distributional implications for poor households will have to be addressed – which can be achieved with a fraction of the auction revenue if well targeted (Neuhoff and Matthes 2008).

Development of a global carbon market

9. Multiple trajectories can potentially result in a long-term convergence to a global carbon markets. This can involve different design options to link schemes (see Neuhoff, 2008a) or build on top-down approaches. The quantitative analysis points to huge uncertainties of base line emissions in countries like China (Neuhoff, 2008c) that would prevent any attempt of direct linking of emission trading schemes, pre 2015 or 2020. The uncertainty could only be managed if private sector agents would be prepared to invest in and bank CO_2 allowances valued at hundreds of billions of dollars. This is, however, a very unlikely scenario.
10. It seems important to build international frameworks based on the specific requirements of emerging and developing economies to pursue effective climate policies (Neuhoff 2006). In the project *International support for domestic climate policies*, country case studies explored the drivers and barriers for individual policies in developing countries, and the type of support they would require for faster, more ambitious and more encompassing

implementation (Neuhoff, 2008c). The detailed analysis points to the importance of using intermediate indicators – that not only measure the direct emission reductions achieved with a specific policy, but already provide feedback about effective implementation, possible barriers, and success of transformational policies and activities.

11. The changing perspective is increasingly reflected in international discussions, with the G77 and China proposal for Technology Action Plans that can encompass a set of National Appropriate Mitigation Actions (NAMAs). This approach offers emerging economies and developing countries the opportunity to enhance their institution capacity and stakeholder support in the field of environmental and technological policies, and can thus create the basis against which these countries can eventually take absolute targets and participate in broader emission trading schemes.
12. Two direct implications for the design and implementation of the European Emissions Trading scheme are:
    a. a reduced role for CDM project mechanisms. As long as the project mechanism offers the opportunity for stakeholders to benefit personally from project credits, further action is unlikely to be pursued. Also, the support tends to go to carbon and energy intensive sectors, and thus prevents a shift towards lower-carbon activities.
    b. an increased importance of auctioning and hypothecation of auction revenue. In the absence of emission trading with developing countries, developed countries (Annex 1 countries) have to find other mechanisms to make resources available to account for their differentiated (historic) responsibility. Taxation of international aviation and shipping can provide some resources, but a credible commitment to use some of the auction revenue for support of domestic action in developing countries is probably necessary to provide the resources that are perceived to be necessary (e.g. financial flows calculations by UNFCCC).

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