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Emissions trading in Europe: Effective tool or flight of fancy?

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The EU Emissions Trading Scheme – Issues and Challenges

On 1 January 2005 the European Union's Emissions Trading Scheme will be launched. While emissions trading is, in principle, widely considered to be an effective and cost-efficient way of achieving compliance with countries' commitments under the Kyoto Protocol, the National Allocation Plans which were prepared and recently published by EU member states have come under heavy fire.

Sonja Butzengeiger* and Axel Michaelowa**

Greenhouse Gas Emissions Trading in the European Union – Background and Implementation of a “New” Climate Policy Instrument

The history of the EU emissions trading scheme (EU ETS) is quite astonishing.¹ Its roots can be found in the Kyoto Protocol (1997) of the UN Framework Convention on Climate Change (UNFCCC). The Kyoto Protocol defines absolute, binding emissions targets for 38 so-called “Annex-B-countries” which essentially are the industrialised countries and some countries in transition. These targets apply to the “commitment period” 2008-2012. In order to reduce compliance costs, “flexible mechanisms” have been defined – emissions trading at country level and the project-based mechanisms Joint Implementation (JI) and Clean Development Mechanism (CDM). Interestingly, the European Union did not support those mechanisms at the international negotiations. This was due to a somewhat ideological conflict that had started in the first years of

international climate policy. The USA was the herald of efficiency and markets while the EU was supporting an approach based on harmonised policies and measures. The EU argued that mitigation efforts should take place at home. However, after the Kyoto agreement was reached, European policymakers turned around to embrace the concept of emissions trading. The first wake-up call for EU negotiators was the failure of the 6th Conference of the Parties to the UNFCCC in The Hague in late 2000. It was generally ascribed to stubbornness on the part of the environment ministers of France and Germany that scuppered a deal with the USA brokered by the UK. The second wake-up call was US president Bush's rejection of the Kyoto Protocol. Thus the EU realised that without accepting market mechanisms, the Protocol would never enter into force. On the domestic side, a decisive catalyst

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¹ Emissions trading itself is not a new instrument. It has been practiced in the USA on regional pollutants SO₂ and NO_x since the mid-1990s. Denmark and the United Kingdom established CO₂ emissions trading schemes with a relatively limited sectoral/geographical scope.

was the fact that the Commission had become wary of the fiscal approach to greenhouse gas reduction as, since 1992, all attempts to introduce a carbon tax had failed due to consistent opposition from the UK. As no other policy instrument was delivering reductions and CO₂ emissions were increasing in the EU in the late 1990s,² the European Commission published a Green Book on CO₂ emissions trading in March 2000. The Commission's call for inputs led to a strong response from emitters, a lesser one from NGOs. Very soon the Commission supplemented the ongoing consultation process in the Green Paper with a multi-stakeholder working group in the European Climate Change Programme. This group met 10 times between July 2000 and May 2001 and concluded its work with the clear recommendation that European trading in GHG permits should be established "as soon as practicable". Astonishingly, the group – bringing together diverse interests with about 30 representatives from some member states, industry and environmental pressure groups – achieved a high degree of consensus.³ In October 2001 the European Commission advanced the debate to a new level by adopting a proposal for a directive on EU-wide trading in GHG permits. The proposal's main points survived all further debates:

- mandatory introduction of trading in GHG permits in all EU Member States as of 2005
- coverage of power and heat generation, iron and steel, oil refining, pulp and paper, cement and other building materials
- coverage of CO₂ emissions only.

From 2001 onwards, emitters were thus getting the impression that they would face a carbon-constrained future even if they still had the hope that the initial allocation of permits would leave them on the safe side. The unsophisticated attempts of German industry to block the scheme failed and in late 2002 the Council of ministers presented its position. After an astonishingly quick resolution of differences with the EU Parliament, the directive was published in July 2003 and became law in October. The trading scheme will start on January 1, 2005. From a laggard in the use of market mechanisms, the EU thus became a world leader in just three years by implementing the world's most comprehensive emissions trading scheme covering

more than 10,000 installations in 25 member states. The international climate policy regime, currently struggling due to the withdrawal of the USA from the Kyoto Protocol and the still outstanding ratification by Russia, urgently needs such political signals. The EU ETS might become a nucleus for an expanding trading scheme at company level worldwide. Emitters and governments of major countries such as Canada and Japan and Australia are already thinking about linking their planned trading programmes to the EU ETS.

Strengthening the international climate policy regime beyond 2012 is necessary in order to reach the deep, long-term emissions reductions needed to stabilise greenhouse gas concentrations. Opponents of stringent climate policies usually argue that emissions reduction is too costly. The mitigation of greenhouse gas emissions does indeed cause costs. However, the costs and damages resulting from the negative impacts of climate change also have to be considered. Re-insurance company Swiss Re recently stated that, "the economic costs of natural disasters, aggravated by global warming [...] threaten to double to \$ 150 billion/year in 2014, hitting insurers with \$ 30-40 billion in claims, or the equivalent of one World Trade Centre attack annually".⁴ Only countries that have accumulated experience in harnessing all low-cost options for emissions mitigation will be able to bend the emissions curve downwards at manageable costs in the long run. Here the EU has also made a remarkable step to link the EU ETS with the flexible mechanisms of the Kyoto Protocol. In April 2004, the EU Parliament agreed on a legal text, the so-called "linking directive", that allows the use of CDM credits from January 2005 without any limit. The survival of the Kyoto mechanisms is thus guaranteed even without the entry into force of the Kyoto Protocol and the linking directive is the first large-scale incentive for private companies to participate in CDM projects.

Crucial Elements at the Political Level

The allocation of emission entitlements, the "allowances", is undoubtedly the most relevant issue in the implementation of the EU ETS. It is financially relevant for all the installations covered. Each stake-

² EEA: Annual European Community greenhouse gas inventory 1990-2001 and inventory report 2003 (Final draft), Technical Report, No. 95, Submission to the UNFCCC Secretariat, European Energy Agency, April 2003.

³ P. Zapfel, M. Vainio: Pathways to European Greenhouse Gas Emissions Trading: History and Misconceptions, FEEM Working Paper, No. 85, Milan 2002.

⁴ Thomas Atkins: Insurer warns of global warming catastrophe threat, <http://www.commondreams.org/headlines04/0303-07.htm>. Note that this increase is not only due to negative effects of climate change, but also to changes in global population, characteristics and quantity of modern infrastructure, etc.

⁵ For a detailed analysis of the NAPs see Regina Betz, Wolfgang Eichhammer, Joachim Schleich: Designing National Allocation Plans for EU emissions trading – a first analysis of the outcome, forthcoming in Energy & Environment, 2004.

holder strives to maximise its allocation of allowances. Consequently, national allocation plans (NAP) are an extremely sensitive issue in political terms. The emissions trading directive only provides broad criteria for member states concerning how to establish allocation plans. Consequently, intense lobbying and political struggles could be observed in nearly all the EU member states. In most cases, those efforts resulted in lax emissions targets, complex special allocations to powerful interest groups and in some cases even in an over-allocation compared to actual emissions.⁵ Especially the accession countries hope to profit from the reductions made during economic transition in the 1990s. In the coming weeks and months, the EU Commission, which has to approve NAPs, will scrutinise them and rumours indicate that they will not pass unscathed. It might be questioned, however, whether the Commission will be able to enforce a considerably stricter allocation. Generally, the demand for allowances will be shifted from large companies that had lobbying clout to smaller ones that were unable to push through special allocations. Moreover, demand for CDM and JI will shift from the private sector to governments because a lenient allocation for industry has to be made up for elsewhere. Current disputes and concerns about distortions of competition between member states indicate that it would be advisable to conduct a harmonised allocation process for future periods of the EU ETS, even if this means that a cumbersome negotiation process will have to be completed at the EU level.

Another relevant aspect is the implementation procedure within member states as the time scale is quite ambitious. Some member states such as Spain and Greece did not manage to prepare a draft of their NAPs. But even the more advanced ones are struggling. In Germany, for example, a working group for emissions trading⁶ had been established as early as 2000. However, the complexity of allocation rules resulting from intense lobbying in the past months as well as the famous German thoroughness made it necessary to establish a federal emissions trading office⁷ with a staff of 80-110 employees. However, this office is still being constituted and has not yet officially started its work. Thus, there is currently no government support for the installations covered in their preparations for emissions trading (see below). The

problem seems to be that the legal basis is still missing. This deficit can be expected to be resolved in the coming weeks. A supposedly final debate in the lower house of Parliament on the NAP law made several changes to the NAP draft.

Critical Elements at the Company Level

According to the preliminary, and still informal, provisions of the German government, operators of installations need to submit their applications for the permission of CO₂ emissions and for the allocation of allowances by August 15 this year. Those applications have to be accompanied by a verified emissions inventory for the years 2000 to 2002. If an operator intends to claim extra allowances for early action measures, electricity production in combined heat and power installations, process emissions or cases of hardship, he needs to submit proof of those special circumstances as well. All this causes a lot of time and effort – since not only paperwork has to be conducted but also old receipts and confirmations have to be provided. Larger companies can be expected to manage this easily – either by putting their own employees onto those tasks or by hiring external consultants. Small and medium sized companies, however, might have to struggle to complete the above-named tasks in time. It might be assumed that many of them simply did not have the capacity to follow the stormy political process in Germany in the past months in detail. Several conversations with operators have also revealed that some of them do not even know about the upcoming tasks and deadlines yet. The HWWA is currently conducting an empirical study on the transaction costs that arise for the installations/companies covered by the EU emissions trading scheme. The results are expected for early August.

Conclusions

The EU ETS is a grandiose experiment that could pave the way for the EU becoming a pioneer in market mechanisms to counter global change. The speed of its implementation has surprised seasoned observers of Brussels decision processes. However, a timid approach to the national allocation of allowances could reduce the credibility of the instrument and prevent learning that will be crucial for later, deep cuts in greenhouse gas emissions. Moreover, it will reduce the private sector acquisition of emission credits from the CDM which is necessary to embark on a global strategy for emissions reduction. A short-term bow to powerful interest groups from sunset industries risks shutting off the way forward for the sunrise industries that will grow on mitigating global climate change.

⁵ Arbeitsgruppe Emissionshandel, AGE. Also see www.bmu.de/emissionshandel.

⁷ Deutsche Emissionshandelsstelle, DEHST. Also see www.umwelt.bundesamt.de.

Claudia Kemfert*, Jochen Diekmann** and Hans-Joachim Ziesing***

Emissions Trading in Europe: Effective Tool or Flight of Fancy?

Europe has reacted to the challenges of climate change by establishing a European-wide emissions trading system. Within the first phase from 2005 until 2007 all 25 European countries will be able to trade emission allowances.¹ The idea of emissions trading is very charming: to reach the overall goal of emissions at minimal economic costs. However, the success of such a system significantly depends on the design, the organisation and the monitoring process. The European Parliament and the Council decided that each member state shall allocate the initial allowances on the basis of its National Allocation Plan (NAP). Up to now some, but not all, European countries, including Germany, have notified their NAP to the European Commission. Comparing this outcome with the allocation solutions of other European countries raises the question whether a successful emissions trading system can actually be achieved. Divergent economic and political interests could stop the process before it starts. In this paper, we highlight the basic features and weaknesses of the European emissions trading system. We assess the outcomes of the NAP in Germany and the consequences for an efficient emissions trading system in Europe.

European Emissions Trading

An emissions trading system can, theoretically, reach a certain emission target with lowest economic costs. This brings advantages in comparison to other economic instruments. However, in reality this goal cannot be reached automatically but needs sincere rules and guidelines. First, it needs to be harmonised with other energy and environmental policy instruments in Europe. The policy mix with some instruments might be complementary and beneficial, with others however more competitive and less favourable. Second, as the initial phase of the emissions trading programme from 2005 until 2007 covers only one greenhouse gas and only the large emitters (partial

trading system), and as there are no binding international commitments on total emission targets, it can be interpreted mainly as a "learning phase" for the next period beginning in 2008, which at the same time is the first commitment period according to the Kyoto protocol. Third, the directive contains many "may" clauses leaving decisions on main characteristics of the allocation process to the member states. Fourth, as some past reductions are counted as early action without concrete proof as to whether these initiatives were made in order to reach additional abatements, the overall efficiency of the programme can be undermined. Some large lobbyists can profit from these rules and other special arrangements, while others are disadvantaged.

The initial allocation of allowances is the crucial factor for the successfulness and efficiency of the emissions trading programme. If the initial allocation of allowances is too high, the emissions trading system becomes ineffective. The discrepancy between industrial and political interests can lead to an initial allocation of allowances that is less efficient.

An optimal allocation of emissions allowances could be reached by a grandfathering system based on past emissions. Another alternative would be to auction emission allowances, which could also lead to an optimal allocation and could additionally bring revenues that could be used for tax reductions. However, for reasons of fairness and in order to avoid competitive disadvantages, the EU directive prescribes that member states shall allocate at least 95% of the allowances free of charge to the installations, and leaves it up to the individual countries to find their national solutions with regard to many aspects of the allocation plan.²

In Germany as in other European countries, the government decided to allocate all initial allowances

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¹ European Commission: Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, in: Official Journal of the European Union, L 275/32, 25.10.2003.

² European Commission: Emissions trading – National allocation plans, Final national allocation plans and available drafts of national allocation plans, 2004, http://europa.eu.int/comm/environment/climat/emission_plans.htm.

free of charge to the large emitters. One primary goal was to be fair and not to distort competitiveness. However, as it is nearly impossible to determine an optimal allocation of allowances exogenously because of incomplete information, climate policy interests and economic interests differ substantially.

The National Allocation Plan (NAP) in Germany

According to the Kyoto protocol and the European burden sharing agreement, Germany is committed to achieving a 21% reduction in emissions of greenhouse gases by 2008 to 2012 compared to 1990 levels. Up to now a 19% reduction has already been realised.³ For CO₂ emissions only, the average emissions level from 2000 to 2002 represented a reduction of 15% compared to 1990. Taking into account the projected development of non CO₂ emissions the German government defined the CO₂ target for the period 2005 to 2007 as 859 million tons – only 0.5% less than the figure for 2000-2002 of 863 million tons. And within these limits the total quantity of allowances allocated to the trading sector is 499 million tons of CO₂, compared to 501 million tons in 2000-2002 (-0.4%). That, indeed, is only a marginal reduction rate. And it has to be kept in mind, that a lot of special arrangements had been made, for example:

- in favour of those industries where the process-related emissions dominate as well as in the case of new installations since 1994, and where early actions are accepted, no reduction compared to the 2000 to 2002 level is stipulated;
- if an old installation is replaced by a new one the operator can keep the allowance given to the old installation for 4 years and for the new installation no reduction will be necessary for another 14 years;
- the extra allowances for combined heat and power plants (CHP) and for the compensation of phasing out nuclear energy amount to 1.5 million tons in each case.

All in all the German NAP is very comfortable for the trading sectors. Only those industries which are not in a position to call for special rules are committed to reducing the CO₂ emissions by 2.45% within the first period from 2005 to 2007.

³ Federal Ministry for the Environment, Nature Conservation and Nuclear Safety: National Allocation Plan for the Federal Republic of Germany 2005-2007, Berlin, 31 March 2004, translation: 07 May 2004; Bundesregierung: Entwurf eines Gesetzes über den Nationalen Zuteilungsplan für Treibhausgasemissionsberechtigungen in der Zuteilungsperiode 2005 bis 2007 (Zuteilungsgesetz - NAPG), Kabinettsbeschluss vom 21.4.2004 (Draft of a German National Allocation Plan Law).

Concerning the non-trading sectors, the CO₂ emissions have to be reduced from 362 million tons in 2000/2002 to 360 million tons in 2005/2007. This also seems to be only a small reduction. But considering the fact that the temperature-adjusted emissions in 2000/2002 add up to approximately 373 million tons the reduction rate (3.5%) will be much higher than the rate for the trading sector. And in contrast to the obligations imposed by the EU directive there is no clear information in the German NAP as to which policies and measures will be implemented to guarantee that these targets will be achieved.

All in all the German NAP – as well as many of the NAPs in other European countries – does not seem to be very ambitious, especially concerning the allowances given to the trading sectors, and is not very clear with respect to the non-trading sectors.

In Germany, not only large lobby groups have expressed considerable concern about the whole emissions trading system, but the Ministry of Economics and Labour has also contended with difficulties vis-à-vis the Ministry for the Environment. This has led to very complicated rules for certain emitter groups which can guarantee neither an optimal emissions trading system nor the overall climate goal. In the end, the overall effectiveness of the emissions trading system can be undermined by such strategic behaviour. An initial allocation of allowances that is too large can distort the climate goal. A “requirements oriented” allocation of allowances as requested by the industrial lobbyists can lead to the fact that there will be no emissions trading at all because of less demand and a too large supply of allowances. Some special rules for CHP or other process-related emissions were negotiated especially for those industrial sectors with high marginal abatement cost curves and fewer substitution opportunities. Some special rules can also undermine the effectiveness of the emissions trading system.

Conclusion

The NAPs must be compatible with the climate goals and emissions reduction targets. Within the first period there will be no concrete sanction mechanism if countries fail to achieve their target, as is planned for later periods. A stringent allocation of allowances would prevent too high a burden on private households and the transport sector. In addition, it would also increase the incentive for other flexible mechanisms such as Clean Development Mechanisms (CDM) and (later on) Joint Implementation (JI). Conversely, some important aspects of the trading system, such as the treatment of newcomers or how to react to the dynamics of the

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market, are not regulated at the European level. This provides a large scope for strategic action and creates uncertainties.

In Germany as well as in many other countries, negotiations between politicians and industrial lobbyists has led to a less effective emissions trading system. It is questionable whether there will be significant emis-

sion trading at all. The climate goal cannot be reached if industries get the emissions allowances that they need to continue business as usual. In the future, it would be desirable to harmonise the specific rules of the initial allocation plan among all European countries in order to avoid strategic behaviour and a weakening of the entire trading system.

Joachim Schleich and Regina Betz*

EU Emissions Trading and Transaction Costs for Small and Medium Sized Companies

According to the EU Directive on Emissions Trading certain installations of the energy industry and of most other carbon-intensive industries will participate in the EU-wide CO₂ trading system (EU ETS) starting in 2005. Installations covered under the EU ETS are listed in Annex III to the Directive and include combustion installations exceeding 20 MWth, coke ovens, refineries and – if they exceed particular thresholds – also installations from the steel industry, the pulp and paper industry and the mineral industry (e.g. cement clinker, lime, glass or ceramics).

The EU ETS requires companies to submit a number of allowances for cancellation corresponding to their actual annual CO₂ emissions. Every company can sell its surplus allowances or, if permitted, save them for future years (banking). From an economic point of view, emissions trading is expected to achieve efficiency gains in reaching the emissions target: companies which can abate their emissions at low cost have an incentive to do this to an increasing extent, since they can sell their surplus allowances at a profit to companies with high abatement costs. Since abatement measures will be realised where they are cheapest, environmental targets can – under ideal conditions – be met at minimum costs. As one of the cornerstones of the European Climate Change Programme, the EU ETS is expected to result in the world's largest emissions trading system to fulfil the EU's obligations under the United Nations Framework Convention on Climate Change and the Kyoto Protocol in a cost-effective and economically efficient way. Nevertheless, those savings in overall compliance costs may, at

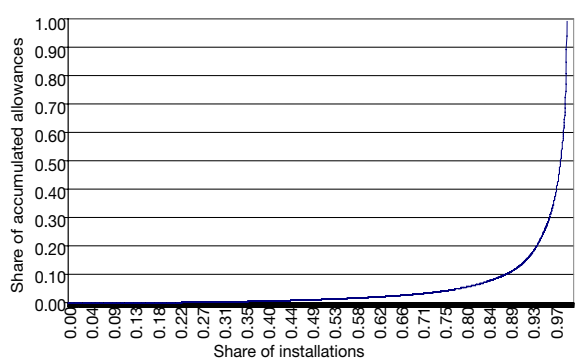
least to some extent, be countered by two sources of transaction costs: costs for administrating the system and transaction costs incurred by companies participating in the EU ETS. In some member states costs for administering the system will be charged to the participants. In Germany, for example, there will be a fee. In Denmark, Ireland or Lithuania, where parts of the allowances will be auctioned off, revenues from the auctions will be used to cover administrative costs.

In the remainder of the paper we shall focus on transaction costs incurred by companies. Two types of costs may be distinguished. First there are transaction costs which are directly implied by the Directive and its national implementation such as costs for the application procedures for allocation and permits, service charges for the accounts in the registry or costs for monitoring, verification and reporting CO₂-emissions (MVR-costs). Likewise companies have to deal with national tax or balance-sheet related issues of emissions trading. Second, in order to benefit from emissions trading and in order to develop synchronised trading and emission abatement strategies, companies need to project emissions, identify and appraise abatement measures, forecast prices for allowances, conduct sensitivity analyses, find trading partners, carry out the trades, manage carbon risk etc. Some of these transaction costs only accrue once at the beginning of the EU ETS such as costs for application procedures for allocation and permits. Others accrue annually, such as MVR-costs, and yet others depend on the number of trades or the trading volume, such as costs for finding trading partners.

Since a large share of these transaction costs is not proportional to company size, transaction costs are

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Distribution of Allowances in Germany



Source: Calculations are based on the list of installations published by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety on 29 April 2004, <http://www.bmu.de/de/1024/js/sachthemen/emissionshandel/oeffentlichkeit>, where the reported quantities do not include additional allocations for early actions or combined heat and power.

particularly burdensome to small and medium sized enterprises (SME). This is particularly important since the criteria for installations to be included in the EU ETS as given in Annex I – in particular the threshold of 20 MWth for combustion installations – imply that the vast majority of companies in the EU ETS will be SMEs. A list of installations covered by the EU ETS in each member state is part of the so-called National Allocation Plan (NAP), where member states state (i) the total quantity of allowances to be allocated in each period, and (ii) how these allowances will be allocated to individual installations. For example, based on the (preliminary) allocated quantities in Germany, about 75% of the installations receive less than 50,000 t of CO₂ allowances per year (see Figure 1). In addition, about 90% of the allowances are allocated to 10% of the installations with the highest emissions, in particular to the large power producers RWE, Vattenfall and Eon. Moreover, an analysis of the available NAPs suggests that overall allocation will be fairly generous, at least in the first phase of the EU ETS in 2005-07.

As a result, companies receive many allowances compared to actual emissions and the additional costs of compliance are likely to be rather low. For example, German allocation rules imply that the above-mentioned installations which receive less than 50,000 t of CO₂ allowances annually will be short by less than about 1250 t per year (assuming emissions in 2005-07 will not be higher than in 2000-2002). Thus, given projected prices for allowances, which recently are well below 10 €/t CO₂, transaction costs for these companies will be high compared to the costs of compliance. As a result, small companies may not even bother spending resources to identify and appraise emission abatement measures. Thus, SMEs are un-

likely to invest in additional abatement measures, although some of these measures may be cost-efficient. Instead, SMEs may just buy or have someone else buy the missing allowances on the market. Since in this case, SMEs increase the demand for allowances in the market for EU ETS allowances, the costs of compliance for other participants may even be higher than if small emitters had been excluded from the EU ETS.

According to Article 27 of the Directive member states may apply to the European Commission for some installations to be temporarily excluded from the EU ETS for the period 2005-07. However, Article 27 also requests that for these installations the reduction target, penalties, monitoring, verification and reporting requirements must be the same as for installations covered by the EU ETS. So far, only a few member states have decided to make use of this provision. For example, the Netherlands intends to exclude small emitters with less than 25000 t of CO₂ emissions per year. These 139 installations (of the total 333 installations in the Netherlands) contribute less than 1.5% of the total CO₂ emissions of the covered installations. For the Netherlands the European Commission may accept the exclusion criteria because the installations are already covered under an existing voluntary agreement (Benchmarking Energy-Efficiency covenant) where targets have to be reached and monitoring is mandatory. So a strict application of the criteria such as equal MVR requirements would not lead to real reductions compared to the EU ETS in these types of transaction costs. In addition, since emission reduction targets have to be the same, the overall costs of compliance for excluded companies are expected to be higher because they cannot trade cost savings across companies. Thus, using the opt-out provision of the Directive is likely to reduce only some transaction costs, in particular those related to the trading of allowances. But actual savings will depend on whether or not the European Commission applies the criteria for opt out rather strictly.

In any case, since most Member States will not use the opt-out provision, reducing transaction costs for participating in the EU ETS will be crucial, in particular for SMEs. In general, transaction costs may be lowered by the standardisation of monitoring, verification and reporting requirements. Likewise, intermediaries such as brokers may be used to reduce search and other information costs. Similarly, if the EU allowance market turns out to be sufficiently liquid, one or several exchanges are likely to emerge where allowances may be traded at low transaction costs. More specifically, SMEs may form pools to procure services, such as

MVR or trading allowances. Such pools may be organised for regions or they may be sector-specific.

To conclude, the significance of transaction costs in

the EU ETS in general and their effect on SMEs and on the performance of SMEs should be evaluated carefully and included in the Commission's review of the EU ETS in 2006.

Werner Betzenbichler*

The Role of the Verifier: Validation and Verification in "Cap & Trade" and "Baseline & Credit" Systems

After several years of development based on the requirements set by the Kyoto Protocol as well as on the experiences from emission trading regimes for hazardous gases in the USA two different schemes for greenhouse gas emissions trading are considered to deliver a suitable approach for emissions trading. Both systems enable private entities to generate and sell tradable allowances or credits by the introduction of more efficient technology. And both systems require the independent assessment of the emission performance of technologies or projects. The two schemes are categorised as

- "baseline & credit" systems, which reward the emissions reduction of a project that reduces greenhouse gas emission below a baseline. This baseline represents the scenario, which represents reasonably the emissions which would have occurred otherwise. Credits will be issued according to the amount of greenhouse gases reduced.
- "cap & trade" systems, which allocate emissions allowances to installations covered by the scheme. It is the responsibility of the operator of each utility to fulfil the reduction obligation either by measures on the plant side (reduced activity level or efficiency improvement) or by purchasing emissions allowances from the market.

The most prominent schemes are the Clean Development Mechanism (CDM) according to article 12 of the Kyoto Protocol as an example of a "baseline & credit" system, and the EU emission trading scheme, which became law with the publication of the EU Directive 2003/87/EC on 25 October 2003 and has since been implemented across EU member states. The latter is a classical "cap & trade" system allocating emis-

sion allowances for free by grandfathering, at least at its beginning. Both schemes will be connected by the EU Linking Directive, which governs the conversion of credits generated by CDM projects into EU emission allowances to be used as compliance tools for industrial operators.

This document discusses the specific requirements of these two schemes concerning the role and the tasks of accredited assessors. A general approach to these issues has been published by the draft of the international standard ISO14064, which is currently under development. It provides a specification for the verification of GHG emissions that can also be considered a suitable framework for the EU ETS scheme. The development of ISO14064 parts 1, 2 and 3 for the monitoring and reporting of entity and project GHG emissions and for the validation and verification of GHG emissions has now reached committee draft 2 stages. As part of its development there is cooperation between TC207 (the ISO technical committee that looks after ISO14064) and CASCO (the ISO Committee that develops conformity assessment standards, e.g. ISO Guides 62, 66, 65 etc.) in order to discuss the potential development of a conformity assessment standard for GHG verification and validation.

Independent Assessment in the CDM

The modalities and procedures of the CDM laid down in the Marrakech Accords have defined the role and the tasks of Designated Operational Entities (DOE). These legal entities have to ensure the compliance of emission reduction projects with all the requirements set by the Marrakech Accords. The process of accreditation of such a DOE as well as the process of registration of a CDM project and of the issuance of certified emission reductions (CER) is supervised by the CDM Executive Board. A DOE

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Tasks of a Designated Operational Entity

A Designated Operational Entity ... shall be accredited (or have applied for accreditation) by the CDM Executive Board (EB) ... and comply with the Marrakech Accords and CDM EB ... Decisions. In addition the Entity shall:

- Validate proposed CDM project activities
- Verify and certify reductions in GHG emissions
- Comply with applicable laws and requirements of the Parties hosting CDM project activities when carrying out its functions
- Demonstrate that it has no real or potential conflict of interest related to the project
- Perform only one of either validation or verification and certification related to the same CDM project (Upon request to the CDM Executive Board, exceptions to this may be allowed). For small-scale CDM project activities the same operational entity may undertake validation, and verification and certification.
- Maintain a publicly available list of all CDM project activities it has been involved in
- Submit annual activity reports on CDM project activities to the CDM Executive Board
- Make the Project Design Document (PDD) and the monitoring report obtained from the project as well as the validation report and verification report publicly available, as required.

Further requirements and information related to Designated Operational Entities: <http://cdm.unfccc.int/DOE/>.

Source: www.vmanual.info.

has to be seen as the sole interface between the CDM Executive Board and the project participants, who are submitting new methodologies to be approved, new projects to be registered and new monitoring reports as the base for the issuance of CERs.

An overview of the different requirements and tasks of a DOE is given by the Validation and Verification Manual (see www.vmanual.info). It was developed in 2003 by several applicant entities (DNV, TÜV SÜD, KPMG) under the umbrella of the International Emissions Trading Association (IETA).

The content of the Validation and Verification Manual is drawn on the experiences gathered to date by the Prototype Carbon Fund (PCF) and third party validators/verifiers. It provides guidelines for the validation and verification process, serves as a tool for third party validators/verifiers, and presents templates for validation and verification reports. The Validation and Verification Manual shall:

- guarantee the quality and ensure transparency of the validation and verification process to enhance trust in the work of third party validators/verifiers, and
- allow third party validators/verifiers to work in a consistent manner, promoting fair and equal treatment of projects.

The Validation of Project Design Documents

The purpose of a validation is to have an independent third party assess the project design or the project

design document. The validation process includes in particular

- the project's baseline
- the envisioned monitoring of project performance parameters including the emission reductions
- the project's compliance with relevant UNFCCC and host Party criteria.

The DOE performing the validation should receive sufficient evidence to allow it to confirm that the project design as documented is complete, sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions. Figure 1 shows the main steps of a validation process.

A core element of the offered validation approach is a risk analysis of all elements, which could include incomplete information, potential for non-conformity or material misstatements. Applying this risk-based approach enables the validation team to determine the need for investigations, on-site inspections and interviews during the validation process. The results of these assessments should provide the necessary input for the appropriate validation opinion.

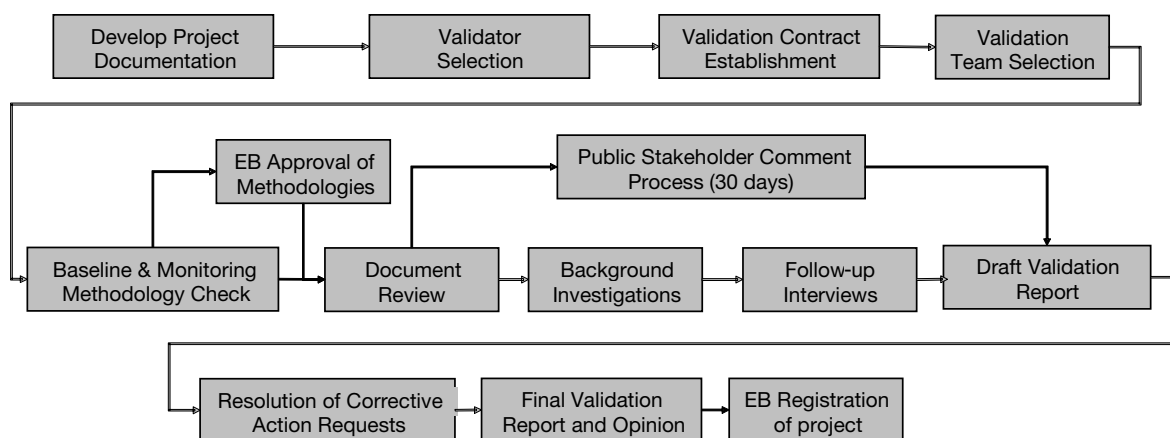
The assessment of the baseline, i.e. the emissions that would have occurred without the project, is one of the most important technical challenges in the course of such a validation. According to the interpretation given by the CDM Executive Board it requires evidence that the project itself does not represent the most likely baseline scenario. Such evidence could be provided by a barrier test, which is already integrated in the methodology previously approved by the CDM Executive Board. In fact, the missing evidence for such barriers is the most frequent reason for denials of a positive validation to date. It is the responsibility of the project participants to provide the required evidence to obtain the necessary level of assurance that a project meets all the requirements.

After the validation is completed, the validator shall provide a validation opinion. The validation opinion shall either form the basis for UNFCCC registration of the project or shall explain the reason for non-acceptance. This opinion will be an important decision factor for project proponents either to proceed or not to proceed with the project.

The Verification of Emissions Reductions

Once a CDM project is registered and finally implemented the project participants have to survey the

Figure 1
Main Steps of a Validation Process



Source: www.vvmanual.info.

greenhouse gas emission reductions by following the monitoring plan approved in the context of the registration procedure. In most cases the project owners will elaborate a monitoring report annually (this is not a requirement, but a reasonable frequency especially for technical projects). This report will include the project performance parameters, i.e. the emission reductions achieved and if necessary further environmental or sustainability indicators.

Again the report has to be submitted to a DOE in order to get the emission reductions verified and certified. Verification is the periodic independent review and ex post determination by the DOE of the monitored reductions in GHG emissions during the verification period.

By the process of verification the verifier has to check, whether

- the project has been implemented as planned
- the monitoring system and quality management procedure are in place and appropriately operated
- the reported GHG emission reduction data is “free” of material misstatements
- the reported GHG emission data is sufficiently supported by evidence (for project emissions and if necessary also for baseline emissions).

The means of verification, such as document review, interviews and on-site inspections, are similar to those of validation, but their focus is on appropriate measurement data rather than on additionality aspects. Also this kind of assessment uses a risk-based approach that assigns a higher workload to areas with

higher risks of material misstatements or non-conformity. The audit conclusion is based on the interaction of four key verification principles:

- compliance with monitoring plan
- materiality / accuracy
- coverage
- quality of evidence.

An on-site visit is deemed to be indispensable for this kind of assessment. After performing all required investigations the verifier has to document his conclusions in his verification statement. It shall give the final verdict on the project in terms of the completeness, comparability, accuracy and correctness of the reported GHG emission reductions. This statement forms the base for the step of certification, at which the DOE requests the issuance of CERs according to the amount of the emission reductions. With that step the DOE takes on the liability for the verified amount of emission reductions. The verification statement should therefore include a high level of assurance.

With regard to the annual repetition of verifications and the need for local presence it is more likely that more regionally or nationally operating DOEs might start business in the near future. Nonetheless the liability aspect will set a high hurdle for smaller entities, which may have problems covering the financial risks implied.

Verification in the EU Emissions Trading System

We shall now deal with further work which is recently under development by IETA member companies

working on verification within the EU ETS. An IETA subgroup is working on “Guidelines for an accredited verification system of the greenhouse gas emissions within the EU Emissions Trading Scheme”, which should be recommended to all member states by the Commissions in order to avoid market distortions and enable the scheme to sustain tangible emission reductions between individual member states.

The European Emission Trading Directive (2003/87/EC) lays down in several articles and especially in its Annex V the need for independent verification. The verification of emissions within the EU Emissions Trading Scheme is required to ensure that the reported emissions are credible, reliable and accurate (Annex V). The text of the EC directive that establishes the emissions trading scheme recognises the value of consistent community-wide market conditions. The directive states that, “a Community scheme would minimize distortions of competition and potential barriers to the internal market that might otherwise arise as a result of a number of disparate trading schemes (and hence prices for carbon) being established in the European Union” (General Remarks).

The EU ETS Monitoring and Reporting Guidelines Annex 1 details in its Section 7.4 the issues of verification and materiality. The scope of verification with EU ETS includes assessments of:

- the total emissions reported by the installation
- the installation’s conformity with the terms of the Permit, specifically the implementation of the defined and approved monitoring methodology and the Monitoring and Reporting Decision requirements in Annex 1 and those additional annexes applicable to its activity.

The verifier’s responsibility is to form an independent statement and report to the installation on the total emissions data as to whether it has been derived in accordance with the approved monitoring methodology (not to be confused with methodologies within the CDM) without material misstatement and whether the installation’s Report conforms to the requirements of the permit.

It is the responsibility of the Competent Authority to approve the monitoring methodologies, and changes thereto. The Competent Authority also considers the acceptability of uncertainties inherent in proposed monitoring plans.

The installation is responsible for:

- ensuring that the monitoring methodology is approved by the Competent Authority, and is regularly

reviewed and updated in accordance with the requirements laid down in the monitoring and reporting guidelines;

- the overall control environment (including information systems, internal controls and resources) from which emissions information is derived;
- conformity with the approved monitoring methodology and the requirements of the Monitoring and Reporting Guidelines.

The required components of the verification methodology, as outlined in Annex V of the EU ETS, are detailed below. It is the verifier’s responsibility to design the verification activities that are to be applied to each installation in sufficient detail and commensurate with the Verification Risk Analysis. The verifier shall record the rationale and objective evidence for its decision on the verification process.

As each installation is required to submit verified emissions information, verifiers should perform the verification process on emissions information at each and every installation. Sampling of a group of installations, even when the group is under common management, will not provide sufficient, appropriate evidence on which to issue verification statements at an installation level.

The verification process shall include the following stages:

- contract review
- strategic analysis
- risk analysis
- definition of the verification plan
- process analysis
- reporting.

When planning the audit, verifiers should make enquiries of management to obtain an understanding of:

- management’s assessment of the risk that the emissions information may be materially misstated as a result of error, fraud or bias;
- the accounting and internal control systems management has put in place to address such risk;
- management’s understanding regarding the accounting and internal control systems in place to prevent and detect error;
- whether management has discovered any material errors.

At the end of the audits and inspection the verifier should be able to give his expert opinion whether he sees any further risk that the emission report contains a potential for material misstatements.

Some EU countries like Germany and the UK do require the verification of the baseline data used for setting the allocation of emissions allowances by the grandfathering approach. In this case baseline does not mean a hypothetical course of emissions in a non-realised scenario, but the real emissions of previous years to be used for this purpose. The principle of verification is the same as for the later verification of emission reports. The main difference is to be seen in the fact that in former years no monitoring guidelines existed. Therefore no operator can be obliged to deliver data in a quality and manner that was not applied at that time. Nonetheless the risk for material misstatements can still be considered as a relevant criterion.

The Necessity of Accreditation Schemes

Accreditation provides confidence in certificates and reports by implementing widely accepted criteria set by the European (CEN) or international (ISO) standardisation bodies. The standards address issues such as impartiality, competence, repeatability and reliability; leading to confidence in the comparability of certificates and reports across national borders. Governments have confidence in testing and certification and verification in support of regulatory functions.

Accreditation means that evaluators (i.e. testing and calibration laboratories, certifiers, verifiers and inspection bodies) have been assessed according to

internationally recognised standards to demonstrate their competence, consistency, impartiality and performance capability.

During the time the CDM has been operationalised, it has been recognised that this scheme needs a new unique level of accreditation. Several members of the Kyoto Protocol are not involved in standardisation and multinational accreditation processes. Therefore it was decided to delegate the task and right of accreditation to the CDM Executive Board. The Board by installing an accreditation panel has developed rules and standards for DOEs which are related to already existing standards like EN45011/ISO Guide 65. The stringent approach of using one single accreditation body provides a high level of confidence on harmonised validation and verification approaches among the DOEs.

The analysis has proved that neither EN45012/ISO Guide 62) nor ISO Guide 66 are suitable for the accreditation of EU ETS verifiers. The monitoring and reporting guidelines document specifies processes that could be covered by either of the accreditation standards EN45004 and EN45011. Furthermore it remains the responsibility of each EU member state how it accredits independent verifiers. This involves a high risk of inconsistencies concerning the implementation of the EU ETS in different countries. Thus, there is a high potential for market distortion. This conflict should be resolved by a common approach on this topic. This is a basic condition for the acceptance of trades between operators from different countries.

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The German National Allocation Plan – a Critical Analysis Taking into Account Important Findings of the Pilot Project Emission Trading North

On 25 October 2003 the EU directive for the trade in greenhouse gas emission allowances became

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effective. It compelled European Union member states to draw up national allocation plans (NAPs) for the first commitment period 2005-2007 which had to be published and notified to the Commission and the other member states by 31 March 2004 at the latest. After very tough negotiations the German Minister of Environmental Affairs and the Minister of Economic Affairs

finally agreed on a compromise on 30 March based on a number of last minute changes and special treatments. The established allocation rules are still controversial and the coming months and years will reveal whether the chosen design stands the test. Politics is called upon to secure cost efficiency and the inherent flexibility of emission trading by minimising transaction costs, maximising market liquidity and establishing an effective incentive structure for emission reductions. To let these advantages become reality, stakeholders need to know how the instrument works and should have a chance to participate in a constructive dialogue with decision-makers. For these reasons, the Energy Foundation Schleswig-Holstein in cooperation with the Association of the Chambers of Industry and Commerce in Schleswig-Holstein and the Union of Employers' Associations in Hamburg and Schleswig-Holstein initiated the one-year pilot project *Emission Trading North – Benefits for the Economy and the Environment* starting in May 2002. This article presents a brief overview of the pilot project¹ and discusses the practicability and the economic efficiency of selected rules of the German NAP, taking into account the main findings of the project.

The Pilot Project Emission Trading North

The opportunity to prepare themselves for EU emissions trading at an early stage was seized by nine companies from Schleswig-Holstein and Hamburg: three from the power sector, three from the paper and pulp sector, and one each from the cement industry, the non-ferrous metal sector and the renewable energy sector. Special attention was paid to the development of emission inventories, the identification and evaluation of emission reduction potentials, the development of an emissions trading strategy, including an internet based multi-period trading simulation and, as the key issue for this simulation, the allocation of emission allowances.² Emission Trading North revealed a number of methodical problems closely related to the question of system boundaries and proposed consistent solutions with respect to the general allocation method, new entrants and shut-down of installations, process

emissions, combined heat and power plants (CHP), municipal waste installations and fuel substitutes. The detailed analysis following below is based on four fundamental general recommendations:

- minimisation of special treatments and transaction costs to realise the advantages of the instrument
- European harmonisation of the allocation method to avoid competitive distortions between countries and activities
- extension of the emissions trading system in the medium term to include more activities and sectors in order to raise the potential of further (direct and indirect) emission reductions and to overcome problems related to threshold values, especially of combustion installations
- early announcement of the climate policy mix and measures applied to those installations outside the scope of the emissions trading directive to avoid competitive distortions and to increase investment security.

Critical Analysis of the German NAP

The German NAP differentiates between a macro plan and a micro plan. The macro plan sets the national targets for the energy and industry sectors and other sectors, defines a common compliance factor of 0.9755 and a reserve for new entrants of 9 m t CO₂ for the commitment period 2005-2007. The micro plan contains general allocation rules as well as special allocation rules for early action, process emissions, CHP and the shut-down of nuclear power stations.

The CO₂ allowances for existing installations are allocated to companies free of charge. In general, the quantity is based on historic emissions, i.e. the installation's average emissions in the years 2000 to 2002 and the compliance factor mentioned above. If the current emissions are less than 60% of the historic emissions an ex post correction will take place with the excess allowances being transferred into the reserve.

When discussing the optimal allocation method for existing installations during the course of Emission Trading North it became clear that the grandfathering method involves a number of disadvantages in terms of economic efficiency. In particular, there is an incentive for operators to systematically overestimate individual emissions and/or activity levels, and at the same time a special treatment of early action is advisable to reward installations that performed better than required in the past. Besides this, it does not take into

¹ Detailed information on the project is available under www.emissionshandel-nord.de.

² The allocation issue is analysed in detail in: M. Hahn, M. Klein, M. Kruska, K. Barzantny: Zwischenbericht Emissionshandel Nord – Anforderungen an einen Nationalen Allokationsplan, report for the Energiestiftung Schleswig-Holstein 2003, http://www.emissionshandel-nord.de/Download_allg/ehn_zwischenbericht.pdf; and in: M. Kruska, M. Hahn, M. Klein, K. Barzantny: 10 Forderungen an den nationalen Allokationsplan – Schlussfolgerungen aus dem Pilotprojekt „Emissionshandel Nord“, Energiewirtschaftliche Tagesfragen 53, 2003.

account the different potential of emission reductions. The benchmarking approach, on the other hand, offers the possibility of incorporating technological progress as well as technological potentials. Emission Trading North, therefore, recommended the intensification of research on this issue to allow for a wide application of the benchmarking approach, especially with respect to the determination of realistic future reduction targets for the energy and industry sectors. Unfortunately, the German NAP took benchmarking into consideration only for new entrants, as described below.

For process emissions an allocation method based on historic emissions for the same period as combustion emissions is used in the NAP, but no reduction constraint (i.e. a compliance factor equal to one) is applied to take account of the smaller technological potential for emission reductions in production processes.

The results of Emission Trading North argue in favour of the inclusion of process emissions into the EU trading system because process emissions contribute to climate change in the same way and quality as combustion emissions. Furthermore, incentives for process or product innovations should be maintained by offering the possibility of selling excess allowances in the market. According to the EU directive, however, account has to be taken of the potential, including the technological potential, of activities. Therefore the application of a compliance factor of one was recommended by the project until the year 2012. For the long term, however, the project rejects a special treatment of process emissions because this not only means limited incentives for innovations and market segmentation but also implies an increasing (relative) reduction commitment of combustion emissions with respect to more ambitious emission caps.

In the German NAP a reserve of allowances is set aside for allocation to (additional) new entrants which will also be issued free of charge and without applying a compliance factor for 14 years according to the "first come, first served" principle and using a fuel-based benchmark for the energy sector and the best available technology approach (BAT) for the industry sector. The activity level is derived from the capacity and the expected average annual production level. The term "new entrants" refers either to increased production capacity of existing installations or to completely new installations in the period 2005 to 2007. Furthermore, the NAP explicitly introduces a "transfer rule" for new entrants replacing existing installations. For a period of four years operators are allowed to transfer the

(higher) quantity of allocated allowances from an old installation to a new installation producing a comparable product. Subsequently, they receive allowances based on average historic emissions without applying a compliance factor for 14 years. In the case of a shut-down allowances cease to be allocated to the installation from the year after the closure.

Emission Trading North underlined the necessity of a consistent treatment of new entrants (new installations), of the replacement of existing installations by new ones and of capacity extensions. In order to avoid incentives that could lead to higher environmental impacts and to assure economic efficiency, new entrants or new installations should not be privileged over the modernisation or modification of existing facilities or over an increase in production. Therefore, the majority of Emission Trading North participants and the expert advisory board favoured a strict buy-in solution for newcomers: any increase in absolute emissions – no matter whether due to an increase in production, capacity extension, newly built plants or the substitution of existing ones – has to be covered by buying the resulting deficit of allowances on the market. As the aspect of new entrants and shut-downs was regarded as a symmetrical problem of paying or receiving a price for a newly introduced input factor, it was consequently argued that any operator shutting down his facility in a given compliance period should be allowed to keep the total allocated quantity until the end of that period. While the German NAP chose exactly the opposite strategy (end of allocation at shut-down, new entrants receive allowances for free), it maintains a certain consistency by making the transfer of allowances to replaced plants possible and treating capacity extensions as new entrants if there has been a technological investment for the extension. However, it should be noted that productivity increases in existing facilities balancing shut-downs of other facilities and leading to lower specific and absolute emissions are not favoured by these rules as they could have been, compared to other emission reduction measures.

The operation of CHP can either be credited as early action or operators can receive additional allowances amounting to 27 t CO₂ equivalent per GWh of electricity produced in cogeneration, in order to compensate for potential competitive disadvantages. An ex post correction factor is applied to avoid abuse of this special treatment.

Emission Trading North intensively worked on the issue of system boundaries and had a close look at

the problems related to CHP. Building or enlarging municipal or industrial CHP implies the avoidance of indirect emissions (power from the public grid) but leads to an increase in direct emissions at the site, although the overall emissions decrease. Operators that reduce the combined production of heat and power achieve a reduction of emissions at the site and thus generate an individual surplus of emission allowances, at the same time generating more emissions in the overall system. To compensate for these disincentives Emission Trading North proposed two alternative options:

- the allocation of additional allowances free of charge to the CHP operator and obtained from a national reserve
- the augmentation of the existing CHP feed-in tariff high enough to counteract the disincentive for CHP generated by the allocation of emission allowances.

While the first option was chosen for the German NAP, it remains unclear if the compensation will be high enough.

Finally, the EU directive explicitly excludes municipal waste installations from the categories of activities covered by the trading system, and the Monitoring Guidelines published in January 2004 so far do not contain transparent and standardised rules for municipal wastes or rather mixed fuels with both fossil and biomass carbon. There is a general recommendation to apply weighted emission factors based on a transparent and documented calculation which shall be agreed with the competent authority. However, those fuels mentioned are used as a common input material for certain industrial and combustion processes covered by the directive, e.g. in the cement industry, competing with the waste industry on this market.

Emission Trading North revealed the competitive distortions with respect to the chosen EU system boundaries. Consequently, the project argued in favour of the inclusion of municipal waste installations in the trading system as soon as possible, an operational and consistent definition of the term "waste installation" with respect to the trading directive and other relevant directives and, last but not least, the application of standardised procedures at the European level to determine actual emission factors of fuel substitutes.

Final Remarks

The pilot project Emission Trading North illustrated that capacity building projects are highly important to increase the acceptance of emissions trading and to

allow for business-friendly solutions. With respect to the review process required by the EU directive until June 2006, this finding implies that a constructive dialogue between business, science and politics on experiences in the pilot phase of the trading scheme should be organised. At present, the allocation of allowances reflecting the emission reduction commitments of individual installations is the main challenge for industry. Therefore, distributional aspects and fundamental discussions on future energy strategies are currently dominating the national debate. This is likely to remain the main topic in the next commitment periods, too. Nevertheless, business and politics are called upon to secure cost efficiency and the inherent flexibility of emission trading by minimising transaction costs, maximising market liquidity and establishing an effective incentive structure for emission reductions. In this context, future work should focus on internationally harmonised rules for new entrants and an optimal framework for investments in most efficient technologies, research on the benchmarking approach to determine realistic future reduction targets, the minimisation of the administrative burden and consistent solutions to the problem of system boundaries. The latter could be solved by an optimal extension of the trading system, e.g. by applying a mid-stream approach to fuel suppliers.

As part of the above-mentioned last minute changes concerning the design of the NAP the total volume of emission allowances allocated was increased significantly. This leads to a less stringent compliance factor with respect to the trading system and implies higher contributions by the non-trading sector, i.e. private households and transport. The question of how emission reduction targets should be defined in terms of the macroeconomic efficiency of climate protection measures was not discussed in detail in the course of Emission Trading North. Nevertheless, the authors argue that thereby efficiency potentials are partially blocked and the cost of climate protection artificially increased. Unless the architects of the NAP follow the general recommendation to include as many emitters as possible either directly or indirectly by the means of a mid-stream approach, business, politics and science need to put additional effort into deducing the most efficient emission reduction targets between the trading and non-trading sector.

Jens-Peter Wegner*

German NAP Punishes Early Actions on GHG Reduction

After the quarrel between Germany's economics minister Clement and his antagonist, environment minister Trittin, over the German National Allocation Plan (NAP) at the end of March 2004, the importance of which was magnified politically, things seem to have settled down again. Clement's intervention was aimed at decreasing the "burden" for industry and energy production. However, companies which will be included in the European emissions trading scheme (ETS) and which are now in the process of preparing themselves for the forthcoming regulations, realise that the plan is far from perfect.

Early mitigation efforts – so called "early actions" – will not be honoured appropriately. Precisely those industrial branches and companies which have invested in climate-friendly technologies/fuels since 1990 and thus have been the driving force of Germany's achievements in terms of CO₂ reduction will be disadvantaged compared to those which have not carried out any early actions.

The basis for the allocation of emission allowances to German operators is the effective CO₂ emissions of an installation in the period 2000-2002, multiplied by a "reduction factor" of 0.9755. This leads to the perverse effect that installations with high relative emissions in this reference period receive a higher cost-free allocation than installations with the same output but lower relative emissions. The same goes for operators which have used less CO₂ intensive fuels such as, for example, gas instead of coal or lignite. While the German government previously promised to honour such early actions, recent allocation rules de facto punish them.

The German sugar industry is one example of this. With the realisation of enormous investments – especially between 1991 and 1994 – the sugar industry reduced relative emissions by 42% between 1991 and 2001. This constitutes a 100% over-fulfilment compared to the overall voluntary agreement of German industry (reduction of relative emissions by 21%). Within industry as a whole, the sugar industry holds the top position in terms of relative CO₂ reductions. However, emissions have not only been reduced in relative terms. In absolute figures, a reduction from about 4.6 to 2.2 million tons annually has been achieved. Thus, about 2.4 million tons of CO₂ are avoided annually. In

contrast, the NAP seems to give preferential treatment to the German energy sector. This sector has achieved only 15% CO₂ reductions since 1990 – which is only half of the German average – but will be subject to the same allocation rules.

However, the above-mentioned reductions of greenhouse gas emissions will not be honoured appropriately. Under the new allocation rules, the best allocation which can be obtained by an accepted "early-action installation" is a reduction factor of 1 instead of 0.9755 for 12 years after the implementation of the mitigation measure. But, as many of the sugar plants in Germany are being operated close to the physical optimum and as some of them additionally use low-emissions fuels, their operators hardly have a chance to realise further reductions in order to reach current/future targets or even to become sellers of allowances.

Especially those installations which have used gas in the reference period 2000-2002 seem to be penalised twice. Not only do they receive a lower allocation, they do not have the mitigation option to change to low-emissions fuels. This constitutes a comparative disadvantage to competitors which still use more CO₂ intense fuels such as oil, coal or lignite. Finally, they must fear being blackmailed by their gas suppliers as a switch to other fuels would be costly in terms of emission allowances.

Those facts result in significant distortions within industry and industrial sectors which, according to our legal understanding, violates the principle of equal treatment. Large emitters of the past are the beneficiaries of the current allocation plan – not the pioneers in CO₂ reduction. In brief: early action rules urgently need to be revised! Let us hope that German parliamentarians are not driven to make even more devastating decisions in the light of their huge time pressure.

The described discrepancies at the national level are even enhanced at the EU level. Some EU member states intend to exclude some sectors from emissions trading (which are covered in other states) or not to impose reduction targets compared to actual emissions. Given overall emissions trends in those countries, this is not logically understandable. The European Commission must take care that all member states impose effective reduction targets, comparable to those in Germany. This might be a crucial factor for the long-term acceptance of emissions trading!

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