SRU German Advisory Council on the Environment

National Implementation of the EU Emissions Trading Scheme:

Market-based climate change mitigation or the continuation of energy subsidies by other means?

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Key Findings

The German approach taken to implementing the EU Emissions Trading Scheme (ETS) has significantly diminished its effectiveness as an economic incentive. Germany's National Allocation Plan I (NAP I) contains a number of mistakes that must not be repeated. As the government prepares its National Allocation Plan II (NAP II), the German Advisory Council on the Environment (SRU) wishes to focus attention on the original purpose of emissions trading: to create conditions that allow the markets to provide cost-effective solutions for combating climate change.

In this Statement, the German Advisory Council on the Environment calls for the new NAP II to take a market-focused approach. The beauty of emissions trading lies in its simplicity. It sets out an overall reduction target to be achieved solely through market mechanisms. This makes emissions trading a key component of any long term climate change mitigation strategy aimed at preventing or controlling harmful changes to the global climate. Yet the scheme has been equipped with a range of special rules for its first trading period. These are the result of overburdening the incentive nature of the scheme with energy and distribution policy objectives. Attempts to meet these objectives have distorted the incentive effect and have thus made climate change mitigation in Germany more costly than necessary.

The ensuing debate on the distribution of assets through the allocation of free emissions allowances has been fired by misleading arguments about the impact of emissions trading on competitiveness. The central argument is that in order to sustain competitiveness, the allocation of emission allowances must either be more generous or 'needs based'. This is driven by vested interests in maximising the windfall profits to be had from emissions allowances and has nothing to do with increasing competitiveness and improving profitability.

Overburdening emissions trading with energy and distribution policy objectives hinders the search for cost-effective solutions to climate change. It is also ineffective as policy support for the promotion of coal-fired electricity and of Germany as a sound location for business investment. Thus, with regard to NAP II and future ETS developments, the German Advisory Council on the Environment calls for a return to the scheme's underlying principles when drawing up emissions trading policy. The Council's recommendations are as follows:

– To abandon periodic allocation of free allowances and instead to auction 10 percent of emissions allowances for the period 2008 to 2012 and 100 percent of emissions allowances from 2012.

Should the problematic process of periodic allocation of free allowances be retained, the German Advisory Council on the Environment recommends the following interrelated alternative measures:

– Greater harmonisation of the EU allocation process and extending the trading period to at least ten years

– A more restrictive approach to allocations for existing installations

– A joint decision to withdraw all special rules

– The abandonment of fuel-specific benchmarks

1 Introduction

1. The EU Emissions Trading Scheme (ETS) was launched at the beginning of 2005. Current preparations for the start of the second trading period (like the first) show signs that the scheme is being overloaded with energy and distribution objectives. From an energy policy standpoint, the aim is to protect the domestic coal industry which could stand in diametric opposition to achieving cost-effective climate change mitigation. In terms of distribution policy, the issue at hand is the allocation of significant assets in the form of free emissions allowances. This conflict of interests is fought out with arguments about how emissions trading impacts on competitiveness. Central to the debate was and still is the ever-recurring argument that a more generous or 'needs-based' allocation process is required to secure German industry's competitive stance. This demand is somewhat paradoxical in that capping emission allowances is an inherent feature of successful emissions trading. More 'needs-based' allocation would no longer achieve this capping objective. The ever-recurring arguments put forward can be summarised as follows:

- High carbon technologies should receive more generous allowances
- 'Needs-based' allocation is the only way for Europe's energy-intensive industries to survive in the global market
- Free allocation of emissions allowances is necessary to promote investment in new power stations

These arguments are all lacking in substance because they confuse two key aspects of emissions trading. Changes in competitiveness result from the fact that emissions trading is integrated into the operational equation as a new scarce resource. The scheme's regulatory provisions thus allow higher profits to be made with low carbon technologies and provide incentives for investment in those technologies. By way of contrast, the market value of allocated emissions allowances alters a company's asset base independent of its new level of profitability. This fires an allocation battle due to the windfall profits to be had from the assets gained from free emissions allowances and has nothing to do with increasing competitiveness and improving profitability.

The confusion between these two problem areas forced a political compromise for the first emissions trading period – one that could endanger the overall aim of the scheme. With its complex allocation rules, the emissions trading scheme takes on an image of energy subsidies by other means, a means that results in significant administrative effort and greater regulatory uncertainty. It is largely ineffective and makes climate change mitigation unnecessarily costly. In the run-up to the first emissions trading period this – along with the misguided competition debate – led to a reallocation of emission reduction obligations to sectors not covered by the emissions trading scheme.

For the second trading period, emissions trading should thus be conducted in line with its original purpose. Rather than ostensibly promoting fuel and business investment policy, cost-saving potential should be exploited solely by providing an overall framework in which the search for cost-effective solutions is left to the market.

2 Emissions Trading: An Effective Approach to Climate Change Mitigation

2.1 The Idea Behind Emissions Trading

2.1.1 Benefits and Conditions

2. By prescribing both maximum emissions for covered sectors and the procedure for allocating emissions allowances, the legislature has effectively made carbon dioxide emissions (CO_2 emissions) a tradable good. This in turns makes polluting the atmosphere with carbon a new production factor in business, one whose costs must be taken into account when planning optimal production quantities.

3. In contrast to standards imposed on individual operators, emissions trading provides for a pre-determined reduction target that allows great flexibility and thus cost-savings because control at the level of individual economic units is left to market mechanisms. The state merely prescribes an overall reduction target and creates the conditions to allow the trading of emissions allowances. Operators can then decide whether it is more beneficial to reduce emissions themselves or to buy in additional allowances. This places businesses in a position to align production to market prices so as to maximise profit and to conduct transactions for as long as further emission reductions result in identical reduction costs in each of the businesses involved. Because further transactions in this situation no longer lead to cost-savings for the individual firm, businesses participating in the emissions trading scheme operate in the aggregate at the cost minimum, meaning the reduction target is met at minimum economic cost (static efficiency). The emissions reduction target is secured by an emissions budget. This scarcity factor drives the market price for emissions allowances, which in turn constitutes a new constraint on installation operators when calculating operational costs.

If the state wanted to achieve a similarly effective result by imposing standards, it would have to lay down an individual, minimum-cost reduction quota. This poses insurmountable problems when it comes to the dissemination of information. Even if it were possible to prescribe a quota, the administrative effort involved would be disproportionately high. Because unused emissions allowances can be traded on the

market at any time, emissions trading (compared with imposed standards) provides businesses with an additional incentive to adjust quantities and advance technology with the ultimate aim of reducing both emissions and costs (known as dynamic efficiency or dynamic incentive) (among others see ENDRES 1994).

4. When the scheme was launched, the transfer of significant assets associated with the allocation of emission allowances was one of the most difficult policy issues to deal with in its implementation. Ideally, original allocations would have neither influenced efficiency (meaning the total costs of the system) nor the competitiveness of individual installations. Nevertheless, the groundrules on allocation of emission allowances must be adhered to. These rest on the basic principle that emissions trading works best if factoring in the market price of emission allowances into the operational equation as production costs is neither restricted by yet further regulation nor distorted by strategic considerations. This means that the allocation process can only be successful if the following conditions exist:

- *Preclude production distortions aimed at maximising allocations*. In multiperiod trading systems, installation operators must not be in a position to use organisational or technical measures to influence future allocations. If, for example, it can be assumed that allocations for the 2008 to 2012 trading period will be made in line with the 2007 base period, there would be an incentive to manipulate future allocations by adjusting production quantities or by adopting specific production processes. Abatement efforts would not only focus on economic efficiency by using technology-provided reduction options, but also on maximising future emission allowance allocations. This would result in the use of suboptimal production technologies and thus to an increase in the overall costs to industry in the quest to combat climate change.
- *Securing long-term rights of use*. If emission allowances are handed out free of charge, they must be linked to a long-term and secure right of use if they are to provide a strong-enough incentive to reduce emissions. Coupled with what are still unknown rules on future allocations, trading periods that are too short in relation to installation operators' investment cycles increase uncertainty and hinder investment.
- *Unrestricted tradability of emission allowances*. Effective and efficient use of full reduction potential is only possible if businesses participating in emissions trading are allowed to trade emissions allowances without restriction at the lowest possible transaction costs. Restrictions on transferability together with high transaction costs hinder the scheme's dynamic incentive effect because it reduces the number of viable transactions and their associated abatement activities.

Such conditions to provide effective and efficient allocation give rise to the logical necessity for the allocation of allowances *not to be linked* to future output. This also

applies to the closing of obsolete installations and the bringing into operation of new ones (see SCHWARZ 2005). This is the only way the allocation process can be kept entirely free from distortion. These conditions play a particularly important role in the ETS and have to an extent been violated by the present allocation process. Significant deficits in terms of effectiveness and efficiency are therefore to be expected with the situation as it stands.

2.1.2 Passing on the Market Price of Free Emissions Allowances

5. Energy providers are frequently criticised for passing on the market price of their emissions allowances to consumers even though they were issued free of charge by the legislature. But from a purely business standpoint, the transfer of costs is correct: it signals the emergence of a new scarce resource, one generated by emissions trading. The signal is transmitted by the current market price and is independent of any price paid (or not paid) in the past.

Emissions trading has produced a new factor market for carbon, thus making it a scarce production factor. In costing theory, production costs are not generated by historical costs (or gifts) but by the costs of resource acquisition in the respective factor markets. Either installations use their emissions allowances (or another available production factor) to produce additional units of output or they sell them on the market. However, the use of emissions allowances in production means waiving the gain to be had from their sale on the market. This gives rise to opportunity costs in the amount of the forfeited sale and forces operators of covered installations to factor in their emissions allowances based on the current or expected market price (SCHMOLKE and DEITERMANN 1994; ROLLWAGE 1994).

Contrary to the ideal of perfect competition, everyday practice does not normally involve the passing on of opportunity costs in full. The degree of cost transfer depends on a range of factors like market structure, consumer response, (distorting) regulation and less than rational attitudes and behaviour. It can thus be expected that competition will be imperfect in the relatively highly concentrated north-west continental segment of the EU single energy market in which Germany operates. This in turn makes the passing on of opportunity costs (based on higher starting prices than under perfect competition) imperfect and dependent on how price adjustments affect the demand for electricity (demand elasticity). Low demand response in the electricity sector goes hand in hand with higher cost transfers. The degree of cost transfer depends on the energy carrier and on basic and peak demand times (European Commission 2005a; SIJM et al 2005, p. 39 ff; CRAMTON and KERR 2002; MATTHES and ZIESING 2006).

6. The logic behind emissions trading is that product prices increase relative to CO_2 emissions, the driver being the market price of and the (opportunity) costs involved in using emissions allowances. A statutory ban on factoring (opportunity) costs into prices would make the scheme virtually redundant. Nevertheless, it is wrong to apportion the most recent price rises solely to emissions trading. Fuel prices on the international market have been rising since 2001 and the ten-year-long low price phase has come to an end.

2.2 Emissions Trading as an Integral Component of a Long Term Climate Change Mitigation Strategy

7. There is international consensus that a rise in the average global temperature compared to pre-industrial times should be restricted to a maximum 2° Celsius to prevent harmful changes in the global climate. In industrialised countries, this calls for radical emission reductions of a magnitude of 80 percent by 2050 compared with levels in 1990. To make the necessary structural changes economically viable, long-term targets are vital in providing planning security. The German Advisory Council on the Environment thus recommends a long-term emissions reduction target for Germany in the above-mentioned amount, plus an interim target to reduce emissions by 40 percent by 2020. Germany also stands to reap additional benefits from innovation-focused environment and economic policy (SRU 2002; 2004b, Section 2.2; 2005). The overall emissions budget and the allocation rules should be set out to ensure that the emissions trading sector plays an adequate role in following the emissions reduction path set out in climate change policy and, at minimum, does not fall short of the prescribed targets.

Emissions trading is an excellent tool for efficient and effective achievement of much-needed emission reductions. The German Advisory Council on the Environment has repeatedly stated its conviction that emissions trading at the primary trading level for fossil fuels is the most effective instrument because the scarcity signal propagates throughout the economy as a whole and takes in cost-effective emissions reduction potential across all sectors. It also provides for accurate achievement of national climate change objectives with the minimum of administrative effort. The Council also believes the current sectoral approach provides a next-best opportunity for targeted climate change mitigation at relatively low costs to the economy overall.

Further, emissions trading should be subject to the above-mentioned long-term targets as they appear to make the projected scarcity, expressed by the forecasted emissions budget, legally binding. This would take account of the long investment cycles in the energy industry (SRU 2002, Para. 473, 540; 2004a; 2004b, Para. 27, 48).

3 Implementation of the EU Emissions Trading Scheme in Germany

3.1 Introduction

8. The Emissions Trading Directive 2003/87/EC was transposed into national law with the Federal Emissions Trading Act (TEHG) of 8 July 2004 and the Federal Emissions Trading Allocations Act (ZuG 2007) of 26 August 2004 (European Commission 2003). The EU Emissions Trading Scheme was launched at the beginning of 2005 and targets selected installations, largely in the energy production sector (over 20 MW heat output) and certain energy-intensive industries (covered sectors). It covers over 11,400 installations throughout Europe. Of these, 1,849 are located in Germany and they account for 59 percent of the country's CO_2 emissions (DEHSt 2005c). The Directive provides for the allocation of free emissions allowances to covered installations until 2008 (known as grandfathering). Because it excludes all other sectors (non-covered sectors include households, trade/retail/services and transport), additional measures must be implemented in those areas to ensure that national climate change targets are met.

The current regime is characterised by periodic issuance of emissions allowances based on allocation rules which are ex ante unknown to recipients. The current and initial three-year trading period (2005 to 2007) is to be followed by subsequent five-year periods. The allocation rules have, however, only been laid down for the first trading period – the rules for subsequent trading periods have yet to be decided.

3.2 NAP I: Structure and Impact

3.2.1 Introduction

9. Member States are required to draw up a National Allocation Plan (NAP) setting out how they will allocate emissions allowances. NAPs must be submitted to the European Commission for approval and comply with a range of requirements. For example, reduction targets must consider Kyoto Protocol commitments (see Annex III of the Emissions Trading Directive).

Germany's NAP I and its Emissions Trading Allocations Act (ZuG 2007) lay down a Macroplan (sectoral emissions budgets for all covered and non-covered sectors), a Microplan (allocation rules at installation level) and a compliance factor. While the Macroplan applies for the first two trading periods (up to the end of 2012), the allocation rules and the compliance factor only cover the first trading period (up to the end of 2007). The compliance factor (Section 5 of the Emissions Trading Allocations Act) expresses the reduction obligation and arises (in simplified form) from the link

between the macro and the micro plans, meaning the link between the emissions budget and the (higher) emissions level in the base period. Consideration of special rules, which exempt beneficiary installations from reduction obligations (compliance factor of 1) leads to an increase in the compliance factor for all other installations (SCHAFHAUSEN 2006; BMU 2004). The following section thus focuses on analysing the structure of the Microplan and the allocation rules at installation level.

NAP I and the Emissions Trading Allocations Act constitute a complex set of regulations with a wide range of special rules and exemptions that can be combined in various ways. Allocation applications submitted by installation operators involve a possible combination of some 58 provisions (DEHSt 2005b). Thus, in drawing up recommendations for the National Allocation Plan for the second trading period (NAP II), it is necessary to take a closer look at the Federal Emissions Trading Allocations Act and to analyse a number of its features.

3.2.2 Returns and Ex Post Adjustments

10. The emissions budget was allocated according to historical emissions (Section 7 ZuG 2007) and (either in whole or in part) according to registered emissions (Sections 8, 10, 11 and 14 ZuG 2007). Different allocation rules were equipped with return obligations, meaning that under these particular rules emissions allowances were only allocated on the condition that they be used by the installation receiving them. This involves all allocations made against registered emissions, including those made against the option rule (Section 7 (12) and Section 8 (6) ZuG 2007). The option rule allows an element of choice in that an existing installation may also be treated as a new installation (Section 11 ZuG 2007). If installations are treated as new installations, they are exempt from reduction obligations for a period of 14 years (see Section 3.2.4). Further, under Section 7 (9) of the Emissions Trading Allocations Act (ZuG) a return obligation (the 60 percent rule) applies whereby excess emissions allowances must be returned to the competent authority if output-driven reductions in CO_2 emissions fall below 60 percent of average annual emissions. The closure rule (Section 9 ZuG 2007) and the special allocation rules for installations using combined heat and power (Section 14 ZuG 2007) allow for ex post adjustments. These are designed to prevent strategic overstating of reported emissions and so-called ‘closure bonuses’ arising from the sale of unused emissions allowances. The rules were not, however, approved by the European Commission, which prompted the German government to take the case before the European Court of Justice (ECJ).

11. Return obligations and earmarking, meaning all provisions that provide for ex post adjustment, diminish the nature of emissions allowances as a tradable production factor. As outlined earlier, unrestricted tradability is the prerequisite for creating cost-

effective reduction potential. It is the opportunity for profitable sale that gives operators the incentive to exploit reduction potential that lies below the market price for emissions allowances. To the extent that they are earmarked for a specific purpose, freely allocated allowances become purpose-related subsidies. This violates a key prerequisite for competition-neutral emissions trading. Because ex post adjustment is designed to prevent registration of overstated emissions, the ban announced by the European Commission amounts to the abandonment of the principle of allocation according to registered emissions (Sections 8, 11 and 14 ZuG 2007) which does not conform with emissions trading in the first place. The ban also affects both the 60 percent rule, which prevents further operation of existing installations that are no longer competitive, and the option rule. Thus the ban on ex post adjustment requires that NAP II do away with those rules that are anyway problematic in terms of efficiency and effectiveness.

3.2.3 New Installations Rule

12. The provisions of Sections 10 and 11 of the Federal Emissions Trading Allocations Act apply to new installations. Under Section 19, existing installations may transfer emissions allowances to new installations as replacement installations for a period of four years (known as the transfer rule) whereupon the compliance factor for the existing installation applies for the entire period. The transfer must take place within three months of the new installation going into operation. These installations receive emissions allowances for a further 14 years without the assignment of a compliance factor. All other, meaning all additional, new installations, receive emissions allowances under Section 11 (ZuG 2007) covering 14 operational years (without the application of a compliance factor) in the amount of the output from expected annual production and an emissions level commensurate with the type of installation involved (new entrants benchmark). The emissions factor used is based on the best available technology and the German government can issue legislation to prescribe the factor for groups of installations with similar products (Section 11 (1) sentence 4, (2) sentence 4, (16) ZuG 2007). Section 6 of the Federal Emissions Trading Allocations Act provides for a reserve to be set aside for the allocation of such emissions allowances.

13. These provisions are designed to allow more generous allocations and exemption from reduction obligations over longer periods (meaning multiple allocation periods), the aim being to promote investment in new installations. This is another instance where the use of periodic reallocation distorts the scheme’s incentive nature. As shown in Section 2.1, the possibility of selling unused allowances provides an ongoing incentive to invest in cost-minimising innovation, including construction of new power stations. This mechanism would be destroyed if special allocation rules exist for the closure of obsolete installations and for existing and new ones. The allocations

represent a form of distortionary earmarking because operators are confronted with differing allocation amounts relative to their investment choices (continued operation, closure, the building of a new installation either as a replacement or as an additional new installation). Operators are thus driven not just to innovate at minimum cost in line with carbon scarcity, but to maximise their allocations. Under this regime, investments in new installations are made less attractive through the simple act of allocating more generous allowances to existing installations (MATTHES et al 2005). By way of contrast, the ban on ex post adjustment mentioned earlier makes closure of existing installations more attractive because operators are allowed to keep their allocated allowances. Part of the logic behind emissions trading is to create the conditions to incentivise innovation while leaving it up to those best placed to decide where the most cost-effective reductions can be made. This logic is contradicted if each individual step (closure, the building of a new installation or the building of an additional installation) is subject to sanctions under the legislature's approach to allocation. With regard to NAP II, existing installations should be given significantly more restrictive emissions allowances and all closure and new installation rules should be abandoned across the board (SRU 2004b, Para. 57).

3.2.4 Benchmarks and Updating

14. Using benchmarks such as those applied for additional new installations (Section 11 ZuG 2007) and for new installations (Section 10 (2) ZuG 2007), NAP I provides further incentives for strategic investment behaviour by allocating allowances according to anticipated output volumes – emissions per unit of output (grams CO_2 per kilowatt hour). In the long term, benchmarks have the same effect as targeted subsidisation of investment in production capacity whose technical processes do better than the benchmark. With a fixed emissions budget, this leads to increased abatement costs, meaning an increase in the price of emissions allowances because the incentive for innovation is too strongly focused on the building of power plants. If future allocations are based not on benchmarks but on future emissions then the resulting distortions will be even greater (BÖHRINGER and LANGE 2003; FISCHER and FOX 2004; SRU 2004b, Para. 55).

One particular criticism of NAP I benchmarks is that they focus on the best available technology at an installation and thus result, among other things, in fuel-related allocation (i.e. different allocations for coal and gas). Allocating higher allowances for coal detracts from the appeal of switching to the fuel that provides the least costly abatement option with the greatest reduction potential. Operators thus have no incentive to switch fuels. Instead, they are encouraged, within the pre-determined path (coal or gas), to achieve reductions through greater efficiency – something that involves inefficiently high investment. High climate change mitigation costs are the

result. The continuation of fuel-specific benchmarks now under discussion with NAP II should thus be rejected.

15. Strategic behaviour can also be fostered by the practice of updating, meaning when the base period for future allocations is ‘rolled over’. Allocation based on future emissions, which at the time of the next allocation will nevertheless be historic, or based on production volumes provides an incentive for strategic increases in emission or production levels that exceed optimal amounts in order to maximise the base for future allocations. This involves allocations under Sections 7 (2) and 10 (1) of the Federal Emissions Trading Allocations Act (ZuG 2007), and also its Section 7 (3) for which the base periods 2000 to 2002 and 2001 to 2003 apply and for which there are plans to extend the base periods for NAP II to cover 2000 to 2005 (SCHAFHAUSEN 2006; FISCHER 2001; SRU 2004b, Para. 55).

16. In the current (learning) phase of NAP I, it is difficult to estimate the extent of the distorting incentive effects of benchmarks and updating. They are nevertheless under discussion for NAP II and for subsequent trading periods. If they become embedded in a stable regime covering multiple trading periods, the distorting incentives provided by benchmarks and updating could gain in importance and should thus be rejected.

3.2.5 Other Special Allocation Rules

17. Special allocation rules still apply for installations that achieved early emission reductions (early actions) (Section 12 ZuG 2007), for process-related emissions (Section 13 ZuG 2007), for installations using combined heat and power (Section 14 ZuG 2007) and for the closure of nuclear power plants (Section 15 ZuG 2007). For installations that achieved early actions between 1994 and 2002 by means of modernisation activities in a specified minimum scope, a compliance factor of 1 applies up to and including the twelfth calendar year following the modernisation activities. In the case of process-related emissions, the competent authority applies a compliance factor of 1 on application if the share of process-related emissions amounts to at least 10 percent of the installation’s total emissions. Upon application, installations using cogeneration receive emissions allowances in the amount of 27 t carbon equivalents per gigawatt hour of generated electricity (kWh net electricity generation). Finally, and also upon application, operators of nuclear power plants receive additional emissions allowances from an annual budget of 1.5 million t carbon equivalents relative to the nuclear capacity closed down. While these allocation rules are primarily of relevance in distribution terms, in their entirety they are instrumental in causing regulatory uncertainty.

3.2.6 Interim Summary: Special Circumstances Foster Uncertainty and Strategic Behaviour

18. Almost half the allocated emissions allowances were issued based on special circumstances which exempt privileged installations from reduction obligations (compliance factor 1). Exemption from reduction obligations by means of special rules covers multiple trading periods, thus severely limiting the scope for future allocations from the outset. The extensive use of the (distribution policy) option rule alone accounts for around 15 percent of the emissions budget (ZIESING and MATTHES 2006). The rule has also led to overshooting of the forecasted budget and has had to be compensated for with greater reduction obligations subject to a compliance factor of <1 (the second compliance factor or proportional cap, Section 4 (4) ZuG 2007). In the latter instance, compensation in the amount of 30 million t CO_2 was agreed for NAP II (DEHSt 2005b).

The at times unexpectedly high use of special rules (particularly the option rule) has resulted in a broad range of compliance factors: reduction obligations thus span levels of zero percent (for 20 percent of covered installations) to 7.4 percent (for 30 percent of covered installations). Operators were hardly in a position to estimate their resulting allocations and reduction obligations in advance (DEHSt 2005a; ZIESING and MATTHES 2006).

19. One result of the uncertain outcome of periodically recurring negotiations (especially in light of the energy industry's long capital investment cycles) is that investment is either postponed or operators choose to implement less ambitious modernisation activities in order to keep their options open (MÜLLER 2005; HUBBARD 1994). Postponing investment is also encouraged by strategic behaviour aimed at maximising future allocations (as outlined earlier) and has contributed to a lack of liquidity in emissions trading (European Commission 2005c, p. 11 f). In the meantime, a different strategy is being openly discussed – one that involves early investment in high carbon technologies to create the right conditions to influence future entitlements to emissions allowances. This is based on the assumption that the allocation rules contained in NAP II will largely constitute a continuation of the Federal Emissions Trading Allocations Act (ZuG 2007) and that no significant changes can be expected until after 2012 (Frankfurter Allgemeine Zeitung, 21.01.2006).

3.3 Failings Due to Overburdening with Energy and Distribution Policy Objectives

20. In its current form, emissions trading is characterised by a wide range of special rules and thus by numerous anti-abuse clauses and extremely modest reduction obligations. This instrumental structure is the result of the overburdening of emissions trading with energy and distribution policy objectives.

21. Many of the special rules contained in the Federal Emissions Trading Allocations Act (ZuG 2007) are aimed at supporting a politically desired energy mix by means of the allocation process. This involves:

- The use of fuel-specific benchmarks as an incentive to prevent the substitution of coal by gas
- Instead, within the respective fuel sectors, the modernisation of power plants is promoted by a range of privileges (transfer rule, compliance factor 1)
- But this is done in a way designed to avoid disadvantaging generation technologies desired by environmental policy (combined heat and power, for example).

Other special rules were designed as compensatory rules from the outset and with the specific aim of:

- Rewarding additional early actions, particularly those involving lignite-powered power plants in eastern Germany
- Compensating for gradual opt-out from nuclear energy
- Compensating for competitive disadvantage arising from process-related emissions, meaning high-energy industries covered by the emissions trading scheme.

In aggregate, the rules more than highlight the attempt to reduce the impact of emissions trading on the energy mix and to block the associated incentive effects. While modernisation within each fuel sector is striven for, full exploitation of all cost-effective abatement options that would foster undistorted emissions trading is not. This makes Germany's climate change mitigation activities unnecessarily costly.

To temper the incentive to modernise existing power plants, the reduction targets contained in the Macroplan were significantly softened and fell far short of those in industry's original voluntary agreement. The Macroplan for both NAP I and NAP II has thus relocated considerable portions of the reduction obligations to non-covered sectors in which emission reductions must be achieved using less-effective measures (SRU 2004a; 2005). This gives covered sectors a relatively constant budget which for the trading period 2005 to 2007 provides reduction obligations of only 2 million t/a and of 10 million t/a for the second trading period 2008 to 2012 (or 2.2 percent of the base

period levels). The covered sector thus makes only a marginal contribution to the required overall emissions reductions of 25 million t/a by 2012 (BMU 2004; SRU 2004a; ZIESING 2005). Hence, Germany's implementation of the ETS is for the most part unambitious and increases the cost of climate change mitigation.

22. Given the structure of German electricity supply and the resulting influence wielded by major energy providers and industrial consumers, it is unsurprising that the effectiveness and efficiency of emissions trading should be undermined in this way. Almost half of German electricity generation is still based on coal, and the electricity generators' current investment plans point to an increase rather than a decline in the share of coal and lignite used in electricity production (BMU and BMWi 2006). Germany has thus created the foundation for an undisrupted, influential alliance to 'protect' coal as an energy carrier. This influence is evident both in the NAP I decisionmaking process and in the current energy debate.

Key industry representatives and those responsible for economic policy within the German government rejected emissions trading well into 2004 (RUDOLPH 2005, p. 336 f). Once it became clear that rejection was no longer politically feasible, representatives from industry and the big energy providers relied on low reduction obligations and on pushing through a range of special rules aimed at 'needs-based' and case-by-case allocation of emissions allowances. With major support from the Minister for the Economy, they achieved a number of partial successes in this regard (RUDOLPH 2005, p. 343 f). Some of the special rules, like the option rule and the second compliance factor which have since proven problematic, were agreed during the night of the last crisis talks held on 30 March 2004 with high-ranking members of the coalition parties.

Emissions trading is characterised by a debate on supply security, competitiveness and regional development policy which ultimately comes down to the relative weighting given to the various energy carriers in Germany (BMU and BMWi 2006). In the debate on security of supply, energy providers with high coal usage and the Federal Ministry for the Economy and Technology (BMWi) in particular point to coal's relative price stability and long-term domestic availability. By supporting coal-generated power, energy-intensive electricity consumers in industry hope for a cheaper electricity supply. The demise of coal and lignite and their use in electricity generation is, after all, a key factor in regional economies. This is particularly the case in the structurally weak states of eastern Germany, in North-Rhine Westphalia and the Saarland, where sweeping and rash capacity reductions would have severe adverse structural impacts and corresponding political consequences.

23. Added to this is the debate on the continuation of nuclear opt-out. This has been further heated by the new grand coalition government and in the run up to the

Energy Summit on 3 April 2006. Currently, there are signs of an alliance being forged between representatives of nuclear opt-out and those of coal-based electricity production. This first took shape at the SPD energy conference on 6 March 2006.

24. The political climate is thus unfavourable for implementation of a NAP II that sets out an ambitious climate protection goal and aims to allow market-based incentives to take effect with the least possible distortion. Plus, the system is overburdened with serious distribution conflicts which are often fuelled by issues concerning fair allocation of emissions allowances and their impact on competitiveness.

The EU Emissions Trading Scheme has had significant distribution effects of a scope entirely new for an environment policy instrument. These arise from the transfer of assets associated with the allocation of emissions allowances and also from the transferability of the costs of emissions trading (CRAMTON and KERR 2002). In Germany alone, some 499 million emissions allowances will be issued in each year of the first trading period (DEHSt 2005c). At an assumed price of 20 euros each, this amounts to almost 10 billion euros. In the covered sectors, businesses with higher allowances have profited most on account of the special rules that apply (SCHAFHAUSEN 2006). The debate on the distribution of these considerable assets has, however, been led by competition policy arguments that fail to take account of the basic mechanisms of emissions trading as an instrument of economic incentive.

(see Section 4). A critique of the misguided competition debate is thus indispensable, not least to avoid a repetition of the mistakes made with NAP I.

4 The Misguided Debate on Competitiveness

4.1 The Impact of Emissions Trading on Competitiveness and Distribution

25. The distribution debate sparked in the lead up to the legislative regulation of emissions allowance allocations continues and has become even more heated as the legislature prepares for the second trading period 2008 to 2012. All special rules share a common feature in that in the public debate, they are all justified by competition issues. The central argument has always been, albeit in various forms, that generous or ‘needs-based’ allocation is necessary to secure existing competitiveness (BDI 2004; 2006; RWE 2004; Vattenfall Europe 2004). This is, however, misguided because it confuses two key aspects of emissions trading, namely competition and distribution (see also SPIETH 2006). The diminishing effect on economic efficiency of many of the allocation rules contained in the Federal Emissions Trading Allocation Act (ZuG 2007) and developed in response to the rush for allocations shows how important it is to

separate distribution and competition effects within the debate when designing a purposeful emissions trading system.

The term competitiveness defines the ability to make a profit from business activities. This ability is (also) influenced by emissions trading because it integrates a new scarce resource factor into the operating equation. Free trading of emissions is competition-neutral because all consumers are confronted with the same new scarce resource, expressed in the form of the emissions allowance price. This alters the factor price for all installations equally (see Section 2.1).

By way of contrast, the amount of emissions allowances allocated alters the asset base of a business independent of its new earnings position. With the free issuance of emissions allowances, assets are transferred to businesses and (where allocation occurs at installation level) to installations. In free markets, this free gift has the effect of an across-the-board subsidy not linked to output and thus of a balance sheet increase in business or asset value. This increase has no impact on competitiveness because it involves pure windfall profits that arise solely from the free issuance of allowances and constitutes no additional revenue from output. The output decision still depends on the returns on investment under the new regime (see Section 2.1.2). Windfall profits are competition-neutral and are relevant only in terms of distribution. It goes without saying that all operators wish to reap the benefits.

4.2 Smokescreen 1: High Carbon Technologies Need More Generous Allowances

26. Those in support of ‘needs-based’ allocation to secure competitiveness emphasise their arguments by placing particular focus on high-emission electricity production or production processes.

What actually decides relative competitiveness under the changed conditions of emissions trading is the level of CO_2 emissions involved in the technology used and not the amount of freely allocated emissions allowances. A change in individual competitiveness is brought about by a shift in the relationship between resource scarcity and production factors. Emissions trading has shifted pricing mechanisms to place greater burden on high carbon technologies, meaning that under the new regime these achieve lower income than low carbon technologies. This shift is the kernel of the intended incentive effect of the emissions trading scheme. Rather than constituting a distortion of the markets, the reduced competitiveness of high carbon technologies is the intended outcome of regulation that makes carbon a scarce resource.

Competitive advantages can only be achieved through efficient use of scarce CO_2 emissions, while competitive disadvantages arise solely on account of the need for higher input quantities, meaning the use of high carbon production processes. Thus,

under the emissions trading scheme, low carbon technologies are the key to business success because they alter the cost structure relative to the quantities involved in different input factors.

27. Individual competitive standing is altered by the very existence of emissions trading as a new form of regulation and not on account of the quantity of free emissions allowances. In other words, high carbon technologies are not made any more competitive through the issuance of free emissions allowances. Attempts to use allocation policy to support high carbon energy carriers are thus destined to failure.

4.3 Smokescreen 2: 'Needs-Based' Allocation is the Only Way for Europe's High-Energy Industries to Survive in the Global Market

28. European businesses that are unable to integrate higher energy prices into their product prices suffer a cost disadvantage on the global market compared with their non-European competitors who are not subject to a similar climate change policy regime. This is where the high-energy industries more severely affected by rising energy costs find their arguments for more 'needs-based' allocation of emissions allowances.

This is another instance where competitiveness is determined by the ability to make a profit under the new regime of scarce emissions. And once again, the relationship between the CO_2 emissions from the technologies used (from the production process) and carbon scarcity is key. If profits drop to such an extent that relocation of business activities appears advantageous, the decision remains unaffected by a 'needs-based' allocation because the windfall profit does not improve the profits achieved from normal business activities. However, the German government can try to achieve through negotiations at multilateral level that non-European countries introduce regulations similar to those that put a monetary value on carbon. Businesses could also counter higher energy prices by balancing their cost disadvantages with process innovation or by creating pricing scope through product differentiation (different types of steel, for example) that allows them to transfer costs. This could see Europe's pioneer role become a competitive advantage (SRU 2005; 2002).

29. The risk of business relocations brought about by emissions trading needs to be put into perspective in any case because the choice of location depends on a range of different factors. Also, high-energy sectors present an extremely heterogeneous image which can sometimes make case-by-base analysis necessary. Even in the most energy-intensive sectors, energy costs are dominated by other cost categories like the cost of labour and materials (EIKMEIER et al 2005). The greater importance of transportation costs sees the sales markets for the German cement and paper sectors

more concentrated in Germany and the EU. They should be better protected to allow better passing on of cost than is the case in the metal sectors with their greater focus on global markets. Then again, in the metal industry the cost of raw materials and currency fluctuation play a much bigger role than electricity price fluctuations (EIKMEIER et al 2005, Section 5.5; REINAUD 2005; p. 67). Only if the factors at differing locations are the same or similar, does the role of differing electricity prices increase in importance.

4.4 Smokescreen 3: 'Needs-Based' Allocation is Necessary to Promote Investment in New Power Stations

30. Another facet of the competition argument involves the claim that generous allocation of emissions allowances makes a much-needed contribution to the modernisation of Germany's power stations. If this were the case, emissions allowances would have the additional function of subsidising new investment. Looking at the longer term, this (contested) hypothesis indicates that lower refinancing costs for businesses with strong cash flows could be an indicator of competition distortion from the across-the-board subsidisation arising from the allocation of emissions allowances. This is, however, reliant on conditions that do not exist in the energy industry.

This argument is based on the premise that businesses that have difficulty in obtaining finance from the capital markets are more dependent on internal financing. A business's cash flow would thus increase commensurate with the extent to which emissions allowances need not be auctioned or excess allowances can be sold on the market. Working on this assumption, the free input of liquid assets in the form of emissions allowances would lead to selective distortion – that is, to a subsidisation of refinancing costs. This is based on the hypothesis of investment-cash flow sensitivity, which in turn is based on a relationship between companies' ability to finance their operations from internal resources and investment. To be more precise, it assigns credit-rationed businesses a higher sensitivity between cash flow (as an approximation for a company's ability to finance its operations from internal resources) and investment behaviour (FAZZARI et al 1988; 2000). This hypothesis is contested and even its proponents concede that the sensitivity prevalent between the 1970s and the 1990s has diminished and is now a less-valid argument (ALLAYANNIS and MOZUMDAR 2004, p. 919). The critique goes deeper, however, because other studies show that businesses which are clearly not credit-rationed also have greater sensitivity between cash flow and investment (KAPLAN and ZINGALES 1997; 2000). Yet other empirical studies indicate equal sensitivities for rationed and non-rationed businesses (GEORGE et al 2004; 2005). This not only casts doubt on whether sensitivity between cash flow and investment provides a reliable indicator of credit rationing, it also attracts more far-

reaching criticism in that there is currently no recognised model with which to measure credit rationing as such. Given that this would involve forming comparable groups by categorising rationed and non-rationed businesses, most studies do this on an ad hoc basis using other one-dimensional indicators like company size, degree of debt and dividend payments (BRUINSHOOFD 2004, p. 14 ff; KAPLAN and ZINGALES 2000).

31. A survey of businesses regarding their financing practices shows that management decisions on the choice of capital structure are secondary to the amount of cash flow. Instead, factors likes creditworthiness and financial flexibility are key (GRAHAM and HARVEY 2001, p. 189 f). In their responses, Germany's four biggest energy providers state that they enjoy excellent creditworthiness and point to their rankings with well-known credit rating agencies such as Moody's and Standard & Poor's. On Moody's ranking scale of Aaa to C, Vattenfall has a rating of A3, EnBW has an A2, RWE receives an A1 with 'low credit risk', while E.ON gets an Aa3 and 'very low credit risk'. Standard & Poor's system ranges from AAA to D. It gives both Vattenfall and EnBW an A-, RWE gets an A+ with 'strong financial security characteristics' and E.ON is credited with an AA- and 'very strong financial security characteristics' (E.ON 2006; ENBW 2006; RWE 2006; Vattenfall Europe 2006).

Large sections of Germany's energy industry possess inordinately high credit-worthiness which means that their refinancing costs are low. This puts paid to any talk of the need for generous allocation of emissions allowances to secure their abilities to invest and maintain their competitive stance. The hypothesis, at least in terms of the German energy industry, does not appear to hold out. When it comes to competition, the deciding factor is the actual return on investment.

4.5 Interim Conclusion: Does Emissions Trading Assist Business Location and Investment?

32. The evidence shows that the quantity of emissions allowances allocated has no influence on a company's ability to increase profit. Thus, the allocation rules used in emissions trading are hardly suited to strengthening the competitive base for high carbon electricity supply. This applies both for the differing allocations made under the German Emissions Trading Allocations Act and for those between different countries within the EU Emissions Trading Scheme. While the allowances issued with every free round of allocations constitute a one-off subsidy and a significant transfer of assets, they are at best an indirect means of providing the intended policy support to promote coal-fired electricity supply. Neither the huge transfer of assets nor the special rules can improve the competitive base for high carbon electricity production. At most they fill the 'war chest' and at best they provide for cross-cutting subsidisation by allowing

companies to fund their operations from internal resources. This line of argument also assumes that companies refrain from exploiting their own profit opportunities.

33. Even if this succeeded, emissions trading does not provide a suitable instrument for subsidisation policy. Emissions trading is an instrument of scarcity expressed by the emissions budget and the value of the emissions allowances traded on the market. Subsidisation policy by means of allocating emissions allowances would diametrically oppose the idea behind emissions trading because the emissions budget only allows someone to receive something that has been taken from someone else. Instrumentalising allowances in this way would also raise the question as to who could claim an entitlement and in what amount. It would inevitably result in the allocation and distribution conflicts outlined in this paper. This is illustrated in the call for compensation in the amount of 30 million t CO_2 under NAP II on account of proportional capping resulting from use of the options rule in NAP I (Section 3.2.6).

Finally, subsidisation of individual businesses through the allocation of emissions allowances does not necessarily guarantee investment in the modernisation of energy production as desired by environment policy. The deciding factor, as repeatedly emphasised, is the actual return on investment. What could actually happen is that ‘war chests’ are filled to provide scope for entirely unrelated transactions like strategic business take-overs.

5 NAP II: Recommendations and Conclusions

5.1 Stability and Simplicity: The Greatest Contributors to Competitiveness

34. The failed attempt to have emissions trading serve energy and distribution policy objectives results in targets being missed with far-reaching negative implications: (1) climate change mitigation is made more costly, (2) costs are transferred to installations that do not benefit from special rules, (3) economically questionable transfer of assets with significant follow-on effects, and (4) ineffectual policy support for coal which is seen as a strategic energy resource. There is thus no justification for the distortion of emissions trading caused by the use of special rules, either on grounds of energy policy or on those of climate change policy.

35. Overburdening of the target-setting system has resulted in extreme complexity and the regulatory uncertainty and deficits in effectiveness and efficiency this brings. This overburdening is thus the most pressing problem in emissions trading at present. In setting out the structure for the second trading period, efforts must be based on the original purpose of providing effective climate change mitigation. For this reason,

withdrawal of the special rules must be made a priority because they diminish efficiency and characterise the instrument of emissions trading as a continuation of policy favouring specific fuels by other means. If the trading periods are retained, they should be extended to at least ten years to provide greater congruence with investment cycles in the energy industry. The need to simplify emissions trading itself has already been recognised by the European Commission and its harmonisation is to be welcomed (European Commission 2005b).

5.2 Auctioning is 'Needs-Based'

36. Many distortions are inherent in periodic reallocation of emissions allowances. A truly effective and efficient system can only be achieved through the auctioning of emissions allowances or by abandoning periodic allocations and instead adopting a system of one-off allocation of free allowances for an indefinite period based on historical data.

For the coming 2008 to 2012 trading period, the scope of the Directive should be fully exploited and 10 percent of emissions allowances should be auctioned. The system should then switch completely to auctioning for the years beyond 2012. The evidence has shown that free allocation has led to intensive lobbyism with all the negative outcomes described above – all of which increase the cost of regulation. As to the competition-related lines of argument, these merely serve as strategic smokescreens in the battle for windfall profits. Auctioning is the simplest and most transparent of all allocation methods and prevents the distribution conflict currently experienced in the emissions trading sector. It must be remembered that the conflict involving the National Allocation Plan only encompasses allocations within covered sectors. In contrast to free issuance of emissions allowances, auctioning has a key macroeconomic advantage in that the value of emissions allowances does not fall to the covered sectors in the form of windfall profits, but to the state in the form of auction proceeds. This opens up new financial scope to reduce distorting taxes or to reduce debts (tomorrow's taxes) and represents more equitable distribution of climate change costs between covered and non-covered sectors (the latter being households, trade/retail/services and transport).

37. If auctioning falls foul of existing power relations, then consideration should be given to making current allocations a policy constant and to doing without renegotiations in the future. This would at least solve the problem of periodic allocations. Emissions trading would then be more effective and efficient, and the more stringent reduction targets would be achieved by devaluing emissions allowances. Doing without auction proceeds would, however, mean waiving the added gains in terms of effectiveness and efficiency.

5.3 Return to the Underlying Principle: Providing a Framework versus Regulating Individual Operators

38. The wide range of special rules reveals the underlying problem of emissions trading in its current form: the attempt to use allocations to serve energy and supposed competition policy while incentivising individual businesses to act in a certain way stands in diametric opposition to the instrument's efficient operation. The explicit aim of emissions trading is simply to create a framework by causing artificial scarcity within the existing pricing mechanism. This new scarcity factor, expressed in the form of the price of an emissions allowance, is the factor needed to incentivise climate-compatible innovation. The market plays the role of an information instrument. As has been shown in the incentive distortions outlined above, 'rewarding' supposedly wise investment choices by the issuance of emissions allowances on the part of the legislature turns this principle on its head.

As already stated, the German Advisory Council on the Environment recommends the complete abandonment of periodic, free allocation of emissions allowances. This means two things:

- Auctioning 10 percent of emissions allowances for the period 2008 to 2012
- Auctioning 100 percent of emissions allowances from 2012 onwards.

If the problematic process of periodic free allocations is retained, the Council proposes the following alternative yet interrelated recommendations:

- Greater harmonisation of the European allocation process
- Extending the trading periods to at least ten years
- Withdrawing all special rules, and particularly the option rule
- Withdrawing the closure rule
- Significantly more restrictive allocations for existing installations
- Withdrawing the new installations rule
- Withdrawing fuel-specific benchmarks.

The aim is to allow the European Emissions Trading Scheme to develop its true potential, namely that of providing cost-effective climate change mitigation. This paves the way for efficient implementation of further, more ambitious emissions reduction targets.

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The German Advisory Council on the Environment
Secretariat
Reichpietschufer 60
10785 Berlin
Phone: +49 –030 /26 36 96-0
Fax: +49 –030 /26 36 96-109
E-Mail: sru-info@uba.de
Internet: www.umweltrat.de

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