

ZEW

Zentrum für Europäische
Wirtschaftsforschung

 **Öko-Institut**

Final Report

for the preparation of an opinion on the proposed

Directive on the Implementation of EU-wide Emissions Trading COM(2001) 581

On behalf of the

**Ministry of the Environment and Transport
of the State of Baden-Württemberg**

by

Marcus Stronzik, Centre for European Economic Research (ZEW)

Martin Cames, Öko-Institut - Institute for Applied Ecology

Mannheim/Berlin, March 1, 2002

Table of Contents

1	General assessment	3
2	Main issues	5
2.1	Allocation	5
2.1.1	<i>Allocation method</i>	5
2.1.2	<i>Allocation criteria</i>	7
2.2	Voluntary or obligatory participation, enabling clauses	11
2.2.1	<i>At the Member State level</i>	12
2.2.2	<i>At the sector level</i>	13
2.2.3	<i>At the company level</i>	16
2.2.4	<i>Possibilities to opt-in</i>	18
2.3	Project-based mechanisms	20
2.4	Consideration of other greenhouse gases	22
2.5	Regulatory overlapping	23
2.5.1	<i>Voluntary commitments</i>	24
2.5.2	<i>Ecotax</i>	25
2.5.3	<i>Promotion of renewable energies</i>	26
2.6	Electricity generation	27
2.6.1	<i>Direct or indirect apportionment of greenhouse gas emissions</i>	27
2.6.2	<i>Consideration of electricity generation from combined heat and power</i>	29
3	Bibliography	32

1 General assessment

It is generally to be welcomed, that with the present Proposal for a Directive (COM(2001) 581) the European Commission has resolutely pursued the debate on the introduction of Europe-wide trading with greenhouse gas emissions, which was initiated with its Green Paper in March 2000 (COM(2000) 87). Emissions trading can be employed in accordance with free market principles as an innovationist, cost-efficient climate policy instrument, which, with regard to its precise targeting, is superior to other approaches.

In its timing, the Proposal fits well into the international framework laid down in the Kyoto Protocol. Similar to the Protocol, the Proposal provides for five-year budget periods from the year 2008. An institutionalized regular process of evaluation will guarantee that undesirable trends within the European emissions trading system and changing overall conditions in the course of climate negotiations can be responded to. The three-year pilot phase, beginning in 2005, enables business enterprises located in the EU to gain early experience with this policy instrument. As a result of inadequate previous experience with this new instrument, the establishing of a learning period is particularly welcomed.

The proposed Directive strives for a compromise between the four – partly competing – criteria of simplicity, effectiveness, subsidiarity and transparency; a considerable task, bearing in mind the only slowly emerging international framework and the diversity of variedly-involved interests, which has been largely coped with successfully. Substantial issues raised in the debate on the Green Paper have found their way into the draft Directive. Mention can be made of the following two issues, to which the Ministry for the Environment and Transport of the State of Baden-Württemberg drew attention in its contribution to the debate on the Green Paper (UVM 2000):

- Selection of the sectors to be included: The provisions of the IPPC Directive have been amended, to the extent that combustion plants with a thermal capacity in excess of 20 MW will be included.
- Co-ordination between the EU and Member States in defining targets: The precise definition of reduction targets is left to the Member States. However, to some extent at least (see below) general conditions for their formulation are laid down. A process is provided for the co-ordination of the procedure, in which national allocation plans are examined by a regulatory committee (Article 23) and, in the case of a negative ruling, are subject to rejection.

In conclusion, attention is drawn to two important proposals to supplement the present draft:

- Substantiation of Annex III: The proposed Directive does not lay down an EU-wide reduction target for the installations affected. In accordance with the principle of subsidiarity, it is left to Member States to decide how they want to distribute reduction commitments from the Kyoto Protocol among individual sectors. This should be disclosed through the drawing up of national allocation plans. The criteria for national allocation plans are, however, of a very general nature. In this respect, the relationship between subsidiarity and transparency does not appear to be well-balanced, to the detriment of transparency. With regard to the crediting of earlier avoidance action, the criteria catalogue could, for instance, specifically provide that the Commission limits the base period to which allocation relates, and also lays down precise demands concerning available data, or a procedure for determining values in the case of missing data. The inclusion of new emitters was also largely left open. The application of EU-wide benchmarks (uniform

emission factors) would restrict the scope for potential distortions in competition and ensure greater planning security for the business enterprises involved.

- Consideration of electricity generation from combined heat and power (CHP): The present draft Directive can lead to a deterioration in the competitiveness of CHP plants on the heating market, where they will likely compete with supplies that are not covered by the emissions trading system (for example, gas-fired condensation boilers). The draft Directive should therefore be amended with regard to the inclusion of CHP plants. A possible solution would be for the proportion of fuel in CHP plants, which is employed for the generation of district heating, to be exempted from the obligation to dispose of emission allowances. From the administrative point of view this approach would be relatively easy to implement, because it would only be necessary to ascertain and verify district heat turnover. The proportion of fuel to be exempted from the allowances obligation can then be determined in connection with a certified rate of efficiency for heat generation of the CHP plant.

The prime objective in the formulation of EU-wide emissions trading should be the avoidance of regulations, which adversely affect competition between participants, or which weaken the competitiveness of participants vis-à-vis potential rivals who are not covered. Because both of these cases bear the risk of distortion in competition, the draft Directive should in this respect be improved without fail.

Based on the Ministry's contribution to the debate, the following issues are dealt with below in more detail:

- allocation,
- voluntary or obligatory participation, enabling clauses,
- project-based mechanisms,
- consideration of other greenhouse gases,
- regulatory overlapping and
- inclusion of the electricity sector

2 Main issues

2.1 Allocation

2.1.1 Allocation method

In the initial phase from 2005 to 2007, the allocation of allowances free of charge (described in the Green Paper as "grandfathering") is binding for all Member States.¹ On account of the pilot character of this period, international commitments from the Kyoto Protocol (in effect from 2008) and as yet unforeseeable future international agreements (in effect only from 2012), this specification appears appropriate, particularly against the background of political acceptance on the part of the companies affected. This is all the more the case, because the USA has pulled out of negotiations, and as a result auctioning would tend to lead – dependent on the choice of redistribution key for auction proceeds – to a deterioration in the competitiveness of European companies vis-à-vis their American rivals.

Furthermore, though auctioning is theoretically preferable to free allocation from the point of view of efficiency, the initial auction in particular appears to be not without problems. Before commencement of the first auction, and because of the lack of reliable information, companies might possess only a vague idea of the evolving market price. The issuing of allowances in the course of an auction, apart from the question of the protection of vested interests, is therefore also linked with the problem of great uncertainty on the part of companies concerning the burden of cost to be expected. In contrast, free allocation enables companies to slowly acquaint themselves with the new policy instrument, while they gather experience and examine their technological options for avoidance.

It would be worth considering whether – as in American trading with SO₂ emissions – a small quantity ought to be withheld for auctioning, in order to set early price signals and to provide for improved market transparency, without at the same time burdening companies at the first auction with too high a level of uncertainty regarding costs. In this way, the advantages of both methods could be usefully combined. In the USA, the first auctions were conducted even before commencement of the programme, which led to a substantial improvement in planning security, and can be identified as one of the factors contributing to the success of the procedure (Koschel et al. 1998). Especially at the introduction of emissions trading, great uncertainty prevails concerning not only market liquidity but also the ensuing price to which future avoidance decisions will be orientated. The objection that, on account of the lack of information on prices, the burden of cost resulting from emissions trading is very difficult to estimate, could be countered – at least in part – through the setting up of an auction reserve.

In general, the draft Directive leaves this possibility to the discretion of Member States, at least for allocation periods after 2008. Such a regulation should however be laid down at an

¹ In a strict sense, grandfathering relates to an historical right to do something within a predetermined period of time. In Article 10 (1) it is stated, that "Member States shall allocate allowances (for the initial period) free of charge". Free allocation to all participants would also be achieved with a zero revenue auction, if proceeds from the auction were redistributed to companies. In its introductory comments on the allocation procedure (Point 13), the Commission takes particular account of the effects of allocation on individual participants. At the same time, distortions in competition should be avoided. This indicates that Article 10 (1) is to be interpreted rather as a procedure in the sense of "grandfathering", because the redistribution of funds with a zero revenue auction would have a different degree of impact on each individual participant (Bergmann 2002).

EU level, in order to avoid distortions. If the matter is left to the discretion of Member States, the situation of a "prisoner's dilemma" arises. The price signal produced is, so to speak, a public good, and no-one can be excluded from its use. The Member State, which conducts such an auction, burdens its companies with additional costs, because the total amount of allowances is not allocated free of charge. From an economic point of view it is unlikely that this information would be voluntarily generated.

For the second phase, from 2008, the method of allocation is for the time being left open. The procedure should be decided upon in the course of a process of examination, in which early experiences are evaluated. On account of the early point in time and inadequate previous experience, as well as changing international conditions, the regular reconsideration of the chosen guidelines is to be welcomed, on account of which the possibility to respond to undesirable trends or changing requirements is conceded. The Commission intends to examine the whole range of experience with regard to the allocation of allowances by June 30, 2006. In this respect, the Commission sees itself faced with a dilemma. On the one hand, it is desirable to allow the experience of the pilot-type preliminary phase to flow into the decision-making process; on the other hand, the procedure ought to be established well before commencement of the second period, in order that uncertainties on the part of companies are kept to a minimum. This is also acknowledged by the Commission. That is why it has put forward the request, that it be able to decide independently – with the support of the regulatory committee (Article 23) – upon the allocation method for the period 2008-2012, under the condition that this proposal be approved by the Member States. This procedure appears appropriate for resolving the timing dilemma, in so far as the procedure is cut short, and it therefore finds our support. Bringing about a decision on the allocation method at a political level – in the Council or Parliament – could prove problematical with regard to time limitation, quite apart from the particular interests of Member States. A time-consuming process of co-ordination bears the risk, however, that at the commencement of the second period the procedure is still undecided. This should be avoided at all costs.

According to Article 10 (2) of the Proposal, harmonized regulation within the EU is also intended for the period after 2008. This is to be welcomed, for with differing allocation methods in different Member States, the relevance in respect of EU law lies in the fact that with "grandfathering", cash-value benefits in the form of emission rights are handed over to companies free of charge, and that these rights are tradable across national borders; whereas companies in Member States with auction procedures have to bid for these emission rights, or buy them on the EU market. The extent to which Article 87 EC (formerly Article 92 EC Treaty) – state subsidies – and Article 97 EC (formerly Article 102 EC Treaty) – provisions of Member States that distort competition – apply, is dependent on the predominant method of allocation (for detailed comments see UVM 2000).

On the other hand, an abrupt change from 2008 in favour of an auction procedure might give rise to considerable legal problems, quite apart from economic friction. In order to ensure a balance between the protection of vested interests, on the one hand, and the utilization of the efficiency benefits of an auction, on the other hand, attention is drawn to the possibility of a gradual transition from free allocation to auctioning by means of "grandfathering" for a limited period – a hybrid procedure. For instance, free allocation could be limited to an average remaining useful – or service – life. Because the Commission has chosen an installation-related approach, such a proposal is worth considering. For formulation purposes, the regulatory committee (Article 23) could lay down an average useful life for particular types of installation. In the course of time, with the limitation of free allocation, more and more rights will accrue to the stock of allowances available for auction.

2.1.2 Allocation criteria

The Draft allows Member States considerable flexibility in deciding upon the formulation of allocation rules in the case of free issue. Annex III contains general guidelines for the drawing up of national allocation plans, and the following criteria are listed, which should be considered:

- EU burden sharing within the framework of Article 4 of the Kyoto Protocol (COM(1999) 230);
- Share of total emissions of the respective Member State represented by those sources covered by the Directive;
- Technological potential to reduce emissions;
- Emission reductions as a result of other EU Directives (for example, renewable energies) are not to be considered;
- Unavoidable increases in emissions resulting from new legislative requirements;
- No allocations in excess of expected requirements;
- Information on the inclusion of new market entrants;
- Information on the consideration of early action on avoidance;
- Inclusion of provisions for public participation.

On the one hand, it is a question of allowing Member States to decide, in accordance with the principle of subsidiarity, how they intend to implement international reduction requirements. On the other hand, distortions in competition between companies participating in emissions trading should be avoided. The chosen approach allows Member States to take account of specific national characteristics. For instance, it is declared national policy in Germany to phase-out nuclear power. The burden on businesses with a high proportion of atomic energy would be doubled, because they would have to replace their present share of nuclear power with other energy sources. Under conditions of competition this would occur primarily with fossil sources (e.g. gas), leading to an increased demand for reduction. The present Proposal allows the possibility of achieving a balance between national business enterprises, in order that energy suppliers with a high level of nuclear power are not disproportionately burdened.

The criteria are expressed very generally. In the final analysis, the responsibility to examine the appropriateness of the selected allocation criteria is left to the regulatory committee (Article 23), which has to decide on the validity of the allocation plans put forward by Member States. In view of the intended time-frame this appears to be problematical, because objections and counter-objections have to be expected, which will prolong the process of final determination. A high degree of standardization should therefore be striven for, and divergence from these requirements individually justified. The current procedure allows too much room for interpretation. The relationship between subsidiarity and transparency does not appear to be quite balanced. The examination of reasons for divergence from a requirement must be carried out more easily, and with less expenditure of time and money.² Further specification

² Specific national characteristics in Germany, in the form of nuclear power phase-out, prove after an initial rough estimation to be probably rather less relevant for the preliminary allocation phase. According to the "remaining electricity" that – based on 85% plant availability – could be generated until the end of useful life of each nuclear power plant, as laid down in the "nuclear compromise", the following decommissioning will result: Obrigheim (Baden Württemberg) 2004, Stade (Lower Saxony) 2005, Biblis (Hesse) 2008. All other nuclear power plants will probably be decommissioned after 2010, unless the operators – as in the case of Stade, whose decommissioning has now been announced for 2003 – transfer the remaining electricity to other nuclear power plants.

of allocation criteria would considerably increase the transparency of the system. National characteristics should be picked up by other policies and measures (see also the comments at 2.5). Member States should nonetheless retain a certain manoeuvrability in the determination of sectoral contributions to emission reductions. At the moment, however, it appears to be too-generously applied.³

Furthermore, the criteria are not only very general, they carry – according to interpretation – the risk of contradiction. If a country wants to reward early climate protection action, for instance, it can happen that the quantity of allocated allowances for a particular installation exceeds actual emissions. The treatment of this conflict of objectives within the framework of Annex III is not clearly evident. The questions arise, whether certain criteria can be conceded priority over others, and which points represent a binding secondary condition for others. The interrelationship of the individual criteria needs to be further clarified.

For the avoidance of distortions in competition between participants in emissions trading, the allocation rules should be formulated as uniformly as possible, and also be applied uniformly in the Member States. With regard to greater standardization, starting-points can be found in Annex IV. The formula "Activity data x Emission factor x Oxidation factor", mentioned in Annex IV, could be stipulated as a binding criterion for the setting up of national allocation plans. Because Annex IV refers to the calculation of emissions, this formula must be substantiated with regard to its application to the allocation of allowances. A possible approach is outlined below.

A distinction could be made between combustion- and process-related emissions (for example, in the manufacture of cement) of an installation. Whereas with combustion-related emissions, the emission factor would be independent of plant technology and result purely from fuel input, in the case of process-related emissions, plant-specific benchmarks should be laid down throughout the EU.⁴ In contrast to combustion-related emissions, process emissions are dependent, as a rule, on the respective plant technology.

In the case of combustion-related greenhouse gas emission, fuel input should be used as a measure of level of activity. With process-related emissions, production data (output) can be used. In both cases, a base period has to be defined, to which the level of activity relates. To achieve standardization and limitation of the latitude accorded to Member States, the time-window for the choice of the base period should be narrowed down.

In determining the time window for the choice of the level of activities, a conflict of interests arises between trailblazers and latecomers in the field of climate protection. How previous avoidance action is to be accounted for, depends on the positioning of the time window.

New entrants and previous achievements

Up to now, there has been no specification of how new entrants and previous avoidance measures are to be treated. Annex III merely demands that the allocation plan provides information on both points.

³ A certain restriction of latitude is already guaranteed by reference to EU burden sharing in the criteria catalogue, because within the framework of national allocation plans Member States have to disclose how sectoral reduction goals will be deduced.

⁴ In order not to excessively restrict Member States in their decisions on how to reach their Kyoto targets through the application of national or EU-wide benchmarks (uniform emission factors), they could be allowed to grant bonuses in the course of allocation to companies that are particularly energy-efficient. This would have to be specially justified by the respective country, however, as a "divergence from the norm". In order not to endanger achievement of the ecological objective, general allocation rules would have to be tightened up elsewhere.

In accounting for previous avoidance measures, the general rule applies: the earlier the base period before commencement of the programme, the better previous action on reduction will be rewarded.⁵ However, an early base year might also involve problems of data availability. If the year 1990 is applied, for instance, the question arises as to what extent reliable emission data (or information on the level of activity) is available for this year for a particular company. If adequate data is not available, but an early year is nevertheless chosen, then the application of conservative benchmarks is conceivable, which take account of uncertainties regarding the data situation. If a company can convincingly document its emissions for this year (for example, with monitoring data), it can then also apply these figures. A later base year, on the other hand, disadvantages companies that have already reduced their emissions some years earlier. If the base period falls after adoption of the Directive – that is, very close to 2005 – companies then have the incentive to postpone investment in avoidance until the commencement of emissions trading, in order to avoid being "punished" with reduced allocation. The criteria catalogue could be more precisely defined to the effect, that the Commission narrows down the base period to which allocation relates, lays down certain demands on available data, and establishes procedures for determining values in the case of missing data. The base period should in any event lie before adoption of the Directive and cover a minimum of two or three years, in order to smooth out cyclical fluctuations. Problems regarding the choice of the referential period can only be briefly touched upon here. Because it is of decisive importance, however, for the question of initial allocation, further research (examination of data availability, etc.) should determine precisely how the period could be narrowed down.

The Proposal leaves the question of the inclusion of new entrants entirely to the discretion of Member States. Analogous to earlier comments on the formulation of allocation criteria for existing emitters, the application of uniform standards for new entrants throughout the EU – differentiated according to technology – appears to be advisable, in order to guard against distortions of competition. In establishing the quantity of allowances available to new entrants in the allocation plan, the criteria catalogue could be supplemented with reference to expected growth in the sector in question. Should further substantiation not occur, the danger will arise, that individual Member States will allocate rights disproportionately to existing emitters at the cost of potential competitors. On account of the strategic behaviour of long-established market participants, this again holds the risk of higher barriers to market entry for new emitters, who would have to purchase rights – in the worst case, for their total emissions – from existing emitters.

Shutdown / closure of installations

The Proposal links the allowance for greenhouse gas emissions to the permit for an installation. Whereas the permit is restricted to a particular installation or place of location, allowances can be transferred. It cannot be deduced from the rules and regulations, that the free allocation of the preliminary period is coupled to operation of the respective installation. It is the intention of the Commission that within the framework of initial allocation plans the total quantity of allowances be laid down, which is earmarked for each company for the period 2005 to 2007. The question, whether an installation continues to be allocated rights in the event of its closure during this period, remains unanswered (Vis 2002).

One argument against binding the allocation of allowances to the operation of a particular plant, is that such a method tends to lead to the prolongation of the useful life of plant, be-

⁵ This statement is only valid, however, when the allocation is orientated towards historic emissions. Where efficiency standards are applied – as proposed above with process emissions – this statement must be qualified accordingly. In this case, trailblazers receive a comparative advantage vis-à-vis those competitors who still operate plants with a higher emission intensity, solely due to the fact that in allocation the same standard is applied to both.

cause the operator must fear disadvantages from the replacement of existing plant through a low-emitting new plant, in particular against the background of the vague rules in the proposed Directive concerning new entrants. According to the rules for new emitters, they are either allocated fewer rights (with free allocation also for new emitters) or they have to purchase rights (at an auction).⁶

The required examination of whether an installation is still in operation, involves moreover a certain administrative effort. The Commission reckons that 4-5000 installations will be covered by the emissions trading system, which will then have to be inspected on an annual basis.

The utilization of a plant as a "cold reserve" could further serve the purpose of circumventing the condition of operation.⁷ Here the operator would not shut down his plant, but rather declare it to be reserve capacity. Operation at low load, as a possible form of evasion, would not make economic sense.

The main argument for binding the allocation of allowances to the operation of a particular plant, is that the granting of so-called "shutdown premiums" is avoided. Should an operator decide for other economic reasons (sales, marketing, etc.) to shut down plants not running at full capacity, if the allocation is not bound to operation he will continue to receive rights. And because he does not replace the shut-down plant, he can sell his "spare" rights on the market and thus receive, as it were, a premium for the shutdown.

The future Directive should clarify the position regarding the treatment of plant closures, to avoid the situation that the problem is variedly handled in different countries. Arguments against binding rights to the operation of a particular installation appear to be more significant. The continuation of allocation over an indefinite period following shutdown does not appear, however, to be adequate to the problem. It is very difficult to justify why a plant, which is closed down in 2006, should continue to be allocated rights even in the fourth budget period. In order to avoid indefinite allocation, its continuation in the case of shutdowns could be restricted to the five-year period (three years in the preliminary phase) in which the shutdown occurs. In this way, "shutdown premiums" would occur on a reasonable scale.

Planning security

It appears to be problematical, that allocations for every period within the framework of a particular allocation plan might be calculated anew, which would result in uncertainty on the part of affected companies. On account of vague international requirements, in particular for the period after 2012, this is not altogether wrong. In this respect, a useful requirement would be that the probable guidelines for the following two or three periods be already included within the framework of the allocation plan, so that companies at least have a certain idea

6 The question of binding the allocation of allowances to the operation of a particular plant influences the investment decision, whether plant is replaced at some time at the same location. With regard to the possible transfer of production abroad, it is only the level of environmental requirements that plays a role, and not whether rights are bound to the operation of a particular plant. International competition for the location of industry is influenced only by differing regulatory standards (reduction requirements). Another question is, whether the costs arising from the intended environmental regulation are at all a relevant factor in decision-making. As a rule, other reasons may be more decisive for such investment decisions (availability of labour, market, maintenance etc.).

7 An operator generally has the opportunity, not to shut down plant completely, but rather – as is the usual practice – to mothball it (over-capacity in the German power business). This so-called "cold reserve" (e.g. an oil-fired power station) can then be brought back into operation after a preparatory period of a few days. Such a plant possesses the necessary permits, is not regarded as shut down, and is in fact not shut down. If it was little in operation in the past, the plant also receives few allowances. A problem arises, when a coal-fired unit, which has been operated in recent years at full capacity, is de facto shut down, but declared to be a "cold reserve", and a new gas-fired unit built. Additional allowances for the gas-fired unit would not be required, because its emissions would already be fully covered by the newly-available rights for the coal-fired unit, for which – as a "cold reserve" – allowances continue to be allocated.

about future regulations. In the energy sector in particular, investments with long-term capital lockup are involved. Such an approach increases the danger of stranded investment and thus of increasing short-term orientation of investment decisions.

A particular risk is attached to the regulation governing the transition from the first to the second phase (2007/2008). Allocated rights are always only valid for the phase in which they are issued. Allowances for the year 2005 can also be used in 2006 and 2007, but not in 2008. Whereas this does not pose a problem for later transition periods, because according to Article 13 surplus rights are replaced with new allowances, this does not apply for the changeover in 2007/2008. Article 13 (2) lays down that Member States "may" issue new allowances to replace surplus allowances from the former period, but does not oblige them to do so. As a result, it is not guaranteed that rights from the preliminary phase will retain their validity beyond transition. To what extent this restriction on the banking of allowances will actually be effective, will depend on just how many States ignore replacement at the beginning of 2008.

A possible reason for the restriction on the transferability of rights from the first to the second phase could be found in international commitments to reduction targets in the Kyoto Protocol. If in the preliminary phase a massive number of allowances are hoarded, and surplus rights not considered when national plans for the second phase are drawn up, this will lead to additional emissions and the danger of falling short of Kyoto targets. The question is, whether rights in considerable number will in fact be transferred. With unrestricted banking of allowances, Member States would on the contrary be forced to be not too generous in allocating rights in the preliminary phase, in which no international commitments exist; and this would in turn represent a certain compensatory regulative. The endangering of planning security through the intended restriction within the framework of the EU system, appears in this respect to be the greater danger. Article 13 (2) should therefore be deleted. The banking of allowances should also be allowed between 2007 and 2008.

2.2 Voluntary or obligatory participation, enabling clauses

The question of whether participation in emissions trading should be voluntary or obligatory has already been thoroughly discussed in connection with the Green Paper on emissions trading (COM(2000) 87). There are three dimensions of voluntary action:

- At the Member State level: Should it be left up to Member States to decide whether or not they want to participate in European emissions trading, or should the regulations be obligatory for all States?
- At the industrial sector level: Should it be left up to Member States to decide, which sectors they should oblige to participate in emissions trading, or is it necessary to specify these sectors at an EU level?
- At the company level: Can companies themselves decide whether they participate in European emissions trading, or should this decision be laid down EU-wide through an order of the EU Council?

These dimensions are discussed and assessed in the following three sections. In addition, the question is discussed, whether those actors, who are not presently covered, should be given the opportunity to opt into the scheme.

2.2.1 At the Member State level

The Proposal provides for no particular regulations regarding the geographical area of applicability of the Directive. To this extent, all installations of the named sectors⁸ in all Member States are registered indiscriminately. Opting out on the part of individual Member States is not provided for. The question therefore arises, on which basis the ultimate decision on the Proposal will be taken, and whether individual Member States, which perhaps do not want to participate in the emissions trading system, can be obliged to implement the Directive.

The Directive is based on Article 175 (1) EC (COM(2001) 581), and would thus have to be adopted by a qualified majority of Member States. It could be argued, that instead Article 175 (2) should be applied, because the Directive has a considerable effect on a Member State's choice between different energy sources and also concerning the general structure of its energy supply. This would mean, that the Directive could only be adopted by unanimous vote.

The fact is, however, that the proposed emissions trading system in no way results in commitment to a particular energy source or a particular structure of energy supply. Through the introduction of emissions trading, Member States have, on the contrary, a greater degree of freedom, because they can provide their contributions to reduction and stabilisation not only in their home markets, but also through the acquisition of emission rights from other Member States. The possibilities of choice between different energy sources will ultimately even be enlarged. There can therefore be no question of a considerable effect on either the choice between different energy sources or the general structure of energy supply.

Consequently, it can be assumed that the proposed Directive can be adopted according to Article 175 (1) EC by a qualified majority of Member States. In the end this means that individual Member States, which do not actually want to participate in an EU-wide emissions trading system, can be obliged to implement the Directive. Whether it comes to that, however, cannot be resolved at present. The Commission is seriously considering the question, whether it would make sense to push through the proposed Directive against the resistance of two major EU States (for example, Great Britain and Germany) (Vis 2001).

The question can nevertheless be raised as to the consequences to be expected, were not all Member States to participate in emissions trading. It is conceivable, for instance, that Denmark and Great Britain, which in the meantime have established their own emissions trading systems, will not participate in EU-wide emissions trading, because they want to continue their own systems. This would ultimately lead to the situation, that a number of different emissions trading systems, with differing prices for one tonne of CO₂, exist side-by-side, which at best would only be of limited compatibility. EU-wide trading with emission rights would hardly be achievable under these conditions. Later harmonization of the different approaches would also be made more difficult. One only needs to think of the years of efforts towards harmonization of energy and CO₂ taxation.

Other countries would possibly renounce participation in emissions trading altogether, because they would not want to additionally burden their companies. This would in turn lead to the situation, that distortions would arise in competition between participating and non-participating Member States, and the European internal market be obstructed as a consequence. Non-participating Member States would therefore have to ensure, through compara-

⁸ Annex I of the Draft Directive names the following sectors: energy conversion, iron and steel, cement, glass, ceramics, paper and board. The chemicals sector is not covered as such. However, energy conversion installations (power generation, steam and heating boilers, etc.) at the sites of chemical concerns are covered, in so far as their thermal capacity exceeds 20 MW.

ble policies and measures, that on the one hand they fulfil commitments in accordance with the Burden Sharing Agreement (COM(1999) 230), adopted by the Council on June 16, 1998, and on the other hand, that as a result of non-participation they do not allow their domestic companies inadmissible competitive advantages. As was mentioned in the statement on the Green Paper, this is an extremely difficult undertaking. Absolute equality of competition in the form of an equal burden of costs can never be guaranteed (see comments on Question 7 in UVM 2000).

From an economic perspective, this would all initially result in the situation, that a uniform price for emission rights would not evolve. Gains in efficiency, which could be achieved through emissions trading, would also be fewer. In addition, in the case of voluntary participation of Member States it would also have to be clarified, for which period of time voluntary participation should be effective, or when participation in European emissions trading should be obligatory.

These considerations clearly show, that an emissions trading system based on the voluntary participation of Member States would turn out to be very complicated. This could hardly be desirable, particularly for the preliminary phase. All in all, the indications are, that the obligatory participation of all EU member States, as proposed by the Commission, is not only relevant to the objective of a EU-wide preliminary phase, but also gives rise to the least distortion in competition and fewer market barriers, as well as promising the greatest gains in efficiency.

Nevertheless, the substantive objections of individual Member States should be taken seriously, and an amicable solution sought to contentious issues. In the case of fundamental opposition to obligatory emissions trading on the part of individual States before commencement of the first commitment period, the intention of the Directive would be jeopardised to such an extent, that further implementation would appear to be pointless. It would then surely be more advisable to utilize the remaining time to develop a generally-acceptable emissions trading system to coincide with the first commitment period of the Kyoto Protocol, or to actively participate in the formulation of international emissions trading between the Annex I countries of the Kyoto Protocol.

2.2.2 At the sector level

With regard to the consideration of different industrial sectors within the framework of the European emissions trading system, the following formulation options could generally be considered:

- A non-harmonized list of registered sectors: According to this, every Member State would be free to decide, which sectors are obliged to participate in the emissions trading system.
- A harmonized list of registered sectors: In this case, the sectors, which are obliged to participate in the emissions trading system, would be laid down throughout the EU.
- A harmonized list of registered sectors, which can be individually extended as required by individual Member States, with or without the agreement of other Member States. With this formulation, there are a particular number of sectors that are obliged to participate in emissions trading. In addition, individual Member States can oblige further sectors of their domestic market to participate in emissions trading.

In deciding upon these formulation options, care must be taken that, firstly, distortions of competition as well as market barriers do not arise, and secondly, the trading system is easy to understand and transparent for all participants.

Bearing these criteria in mind, in the proposed Directive the second of the above-mentioned options has been chosen. The Directive itself lays down which sectors will participate in emissions trading (COM(2001) 581, Annex I). Individual Member States can neither add further sectors nor exempt individual sectors among those registered from the obligation to participate in emissions trading.⁹

Every other variation would lead inevitably to differing formulations of the Directive's registration section in different Member States. As a result, distortion in competition and adverse effects on the free movement of goods could be no longer ruled out. From that point of view, and from an economic and European legal perspective, the only sensible formulation option has been chosen.

The question arises, however, whether the Directive's list of registered sectors is, on the one hand, sufficient in scope, and on the other hand, sufficiently clear and practicable. Altogether six sectors are listed: energy, iron and steel, cement, glass, ceramics as well as paper and board. In part, there are trivial limitations, such as in the energy business, where combustion plants smaller than 20 MW are not included. Activities such as waste incineration, in respect of which great uncertainties exist regarding monitoring and control, are likewise excluded. The chemicals industry is only covered to the extent that combustion plants with a thermal capacity in excess of 20 MW are operated for the generation of power for internal use.¹⁰

The Commission maintains that as a result of this sectoral limitation, 46% of total CO₂ emissions forecast for 2010 will nonetheless be covered, which represents almost 40% of greenhouse gas emissions recorded in the Kyoto Protocol (COM(2001) 581). The Commission's figures cannot be examined here, because plant-specific, EU-wide emission records are not yet available. They do not however appear to be implausible, for the sectors registered do in fact contain the few really energy-intensive industrial sectors. Rough estimations for Germany show that the share of total CO₂ emissions represented by the registered sectors is actually larger (52% in 1995, StBA 2001). From that point of view, one can assume that these sectors are of sufficient scope to ensure that a large enough market with adequate liquidity is achieved.

Environmental organizations demand that the chemicals industry, with its process-related emissions, be also included from the beginning, and that the Directive be extended as soon as possible to other industrial sectors (CNE 2001). With regard to the first demand, the Commission points out that if the scheme is extended to include the chemicals industry, 34,000 additional actors would have to participate in the preliminary phase (COM(2001) 581). On account of the heterogeneous structure of the European chemicals industry, enormous problems would be involved, in particular with regard to reporting, control and verification. It is therefore quite sensible to initially exclude the chemicals industry, particularly as 60% of the

9 In an earlier draft of this Directive there was also the option of exempting individual sectors from participation in emissions trading, when greenhouse gas emissions could be achieved through other measures. As long as the same greenhouse gas reductions were actually achieved through such other measures, this regulation would presumably not result in distortions in competition or adverse effects on the free movement of goods. From the administrative point of view, however, such a regulation might well be considerably more costly. It would also be important, that greenhouse gas reductions achieved with other measures could be precisely quantified, and that sanctions, comparable to those in the emissions trading system, be threatened where reduction objectives were not attained. From an overall economic viewpoint, the opting-out of individual sectors leads to the situation, that achievable gains in efficiency prove to be fewer. Because all technological measures outside the emissions trading system can also be conducted as avoidance strategies within the emissions trading system, no advantage is discernible from the opting-out of individual sectors, particularly from an overall economic perspective.

10 The same applies basically to other industrial sectors. In so far as they operate combustion plants with a thermal capacity in excess of 20 MW for the generation of power for internal use, they would be covered by the emissions trading system, although other emissions of the sector are initially not covered.

sector's CO₂ emissions are already covered through the inclusion of power generation for internal use. There is basically nothing to be said against extending emissions trading to further sectors. The Commission emphasizes, that this should be realized through amendment of the Directive and not be left to the regulatory commission. In any case, extension should only then take place, when early experiences have been gathered. For the pilot phase, the group of registered sectors is quite sufficient to enable all elements of the emissions trading system to be tested.

It remains to be examined, whether the list of registered sectors could possibly be reduced. It is conceivable, that the glass as well as the paper and board sector, that respectively account for less than 1% of CO₂ emissions, be removed from the list. The scope of the emissions trading system would hardly be diminished as a result. This does not however appear to be advisable, for the number of registered sectors would thereby be reduced from six to four, with the consequence that the possibility to gather experience with intersectoral trade in emission rights would be further restricted.

All in all, it appears that the sectoral limitation proposed by the Commission represents a well-balanced compromise between the objective of adequately covering greenhouse gas emissions, so that an efficient market with adequate liquidity can be set up for emission rights, and the objective of keeping the group of participants to a manageable size, so that, particularly in the pilot phase, the emissions trading system remains transparent for participants and gains in efficiency are not offset by transaction costs.

It should also be questioned, whether, apart from the sectors that have been obliged to participate, further sectors should be granted the right to participate voluntarily in the emissions trading system, possibly only in individual Member States. This could, for instance, be of interest to those sectors, which would like to gain experience with emissions trading from the very beginning, or expect that their constituent companies would primarily or exclusively function as sellers of emission rights.

It should be considered at this point, that the Proposal does not refer to industrial sectors or their respective industry associations, but rather to installations in the listed sectors. Industry associations, on the other hand, generally represent a number of business enterprises and thus a number of installations in a particular sector, without however assuming responsibility for a single one of these installations. The consideration of other sectors would therefore not be compatible with the rest of the emissions trading system, and the actors involved (industry associations) would not be compatible with the categories of the proposed Directive, whose structure is installation-related. The granting of the possibility of participation to further sectors would be a logical violation, and would require a fundamentally different concept for the whole Directive.

Furthermore, the question arises, how possible voluntarily-undertaken commitments for reduction and stabilization on the part of an industrial sector should be divided among constituent companies, and in which form, and through whom, emission rights should be allocated. An approach similar to the voluntary commitment on climate protection on the part of German industry, by which collective reduction commitments are scrutinized on the basis of comparatively general information provided by companies and industry associations, appears hardly advisable. Because emission rights represent a real value, which can be traded nationally and internationally between companies, they have to correspond precisely with the actual emissions of individual installations. A detailed, installation-specific record of the use of fossil energy sources is in this respect absolutely essential.

The Commission points out, that the proposed emissions trading system is fundamentally compatible with the voluntary commitments existing in many Member States (COM(2001)

581). For this, however, relative reduction targets have in most cases to be transformed into absolute targets, and the emission rights at first allocated to individual installations. It would be conceivable, that the companies of a particular sector then pool their emission rights, and that trading in these rights be then conducted by the respective industry association. Ultimately, individual plant operators are responsible for fulfilment of the emission rights obligation. As a consequence, at the end of each commitment period the emission rights would have to be handed back to plant operators.

These considerations show that there is little sense in enabling further sectors or industry associations to participate in emissions trading. Should further installations, apart from those already listed, be granted the option to participate in emissions trading, this should probably be effected at the company or installation level, rather than at the industry association or sector level (see also Sections 2.2.3 and 2.2.4).

2.2.3 At the company level

The proposed Directive obliges the operators of large stationary installations from registered sectors to participate in the emissions trading system.¹¹ Demands have been made by the German Federal Government,¹² the Conference of Economics Ministers¹³ and by German industry associations, that participation in emissions trading – as is currently being planned in Great Britain – should at least in the preliminary phase from 2005 to 2007 be voluntary.

The question therefore arises as to what might motivate potentially-affected companies to participate voluntarily in emissions trading (AGE 2001):

- to gather experience;
- to influence formulation;
- to cultivate an environment-friendly image in corporate communications;
- the search for efficient greenhouse gas reduction options;
- employee motivation.

Only in the case where allocated emission rights, on account of extensive credits for earlier avoidance action, exceed actual emissions, is there a direct economic interest in emissions trading. Otherwise, there can hardly be justification in the strict economic view for the voluntary participation of companies in emissions trading. For those companies, which have to reckon with additional costs from such an emissions trading system, are unlikely to be interested in participation. Businesses with low marginal avoidance costs, on the other hand, are very interested in participation, because they figure out that they can sell surplus emission rights. If participation is voluntary, companies wanting to sell emission rights, will hardly find

11 No-one is obliged to participate in emissions trading. So long as the allocated rights are sufficient, there is no necessity to do so. If actual emissions exceed allocated emission rights, the company affected can still choose between taking action to avoid emission or purchasing emission rights. In this sense, therefore, no company is forced to participate in emissions trading. Emissions trading is always voluntary, and occurs only then, when it is in the interest of the companies concerned.

12 In its statement to the hearing on the European Emissions Trading System on October 10, 2001, the Federal Government demanded that within the framework of a three-year, open-ended pilot phase, which would be scientifically evaluated, companies be allowed to participate voluntarily in emissions trading. Economic incentives to participation should be established both at an EU and Member State level (BMU 2001).

13 On account of "numerous, not yet adequately resolved practical problems of implementation", the Conference of Economics Ministers supports the endeavours of the Federal Government in the Council of Ministers to try to bring about, that emissions trading is initially tried out in a pilot phase on a voluntary basis (BMW 2001).

other companies wanting to buy these rights. The demand for emission rights is therefore zero, and the price for emission rights is therefore also zero.

Voluntary participation in emissions trading can therefore only function when there is an appropriate material incentive to participate. Such an incentive could be the additional payments that companies can expect from participation in emissions trading, and also, that participation might exempt such companies from obligations they might otherwise be subject to.

In the British emissions trading system both options are planned. On the one hand, on April 1, 2001 a Climate Change Levy was introduced in Great Britain; and on the other hand, between 2002 and 2006 a total of £ 215 million (approx. € 350 million) will be made available by the British Government as an incentive to participation in emissions trading. These funds will be auctioned off in a so-called reverse auction to companies that are willing to commit themselves to greenhouse gas reductions. Only those companies can participate in the auction, which submit a verified baseline. The funds will go to those companies who offer greenhouse gas reductions at the most favourable price, and this will have the effect, that with a limited amount of incentive the greatest possible greenhouse gas reduction will be achieved.¹⁴

The Climate Change Levy will be raised on fossil energy sources and electricity, and shows certain similarities to the German ecotax. In contrast to the ecotax, however, fossil energy sources employed in the household, traffic and power generation sectors will not be subject to the Climate Change Levy. Companies in energy-intensive sectors, which have negotiated a voluntary commitment (climate change agreement) with the British Government, receive an 80% reduction in Climate Change Levy.¹⁵ The commitments are, as a rule, specifically defined. These companies can also participate in emissions trading through a so-called gateway, either to dispose of surplus emission rights or to acquire additional rights required to fulfil their obligations.

The British emissions trading system, which in the meantime has also been notified by the EU, confirms that the system can be planned in such a way, that individual companies are free to decide whether they participate or not. With regard to a voluntary emissions trading system at a European level, however, a number of questions arise, which have yet to be settled:

- How should the funds for material incentives be raised? Can funds from the EU budget be made available for this purpose, or will material incentives have to be provided by additional contributions from Member States? In the latter case, the question arises as to the principle, according to which the financial burden will be shared.
- Or should material incentives – as in Great Britain – be provided in the form of a climate tax, which companies can avoid through participation in emissions trading? In view of the fact that taxation measures can only be adopted unanimously in the EU, and that EU-wide harmonization of CO₂ and energy taxation has for years been rejected by various Member States, the chances are that this proposal would ultimately result in the blocking of emissions trading. Introduction before commencement of the first commitment period would be doubtful, so that realization of the intention of gathering early experience with the policy instrument would be unlikely.

14 With allowance prices of 5 to 10 €/t CO₂, greenhouse gas reductions of 8.5 to 17 million t CO₂ per year could be achieved with this budget. This represents around 9 to 18% of Britain's total reduction commitment according to the EU burden sharing agreement.

15 In the meantime, climate change agreements have been concluded by the British Government with over 30 industry associations.

- Assuming that a trading system similar to the British system would be introduced in the EU, the question is raised as to whether voluntary agreements on greenhouse gas reduction should be negotiated with industry associations at a European or Member State level. Because of strongly divergent national interests in industry associations, agreement at the European level would probably only be reached in a few cases. Were these agreements to be negotiated at a national level, however, the danger would arise, that different objectives would induce distortions in competition within individual industrial sectors.

The question has also to be addressed, whether a quite different intention is not in fact pursued by industry associations with the demand for voluntary participation, namely, that through the emissions trading system no additional burdens should arise for those sectors affected.¹⁶ Should this be the case, the setting up of negative incentives, for example in the form of a tax, would naturally also be less acceptable, unless these negative incentives were compensated by relief elsewhere. It could also be considered as compensation for the additional burdens of an emissions trading system.

To sum up, the following can be established: The current Proposal for a European emissions trading system provides for obligatory participation of companies from the industrial sectors listed. Basically, the system could also be structured in such a way, that companies would be free to choose whether they participate in emissions trading or not. The formulation of such a voluntary emissions trading system is, however, considerably more complex and – as the debate has shown – fraught with a number of unanswered questions. In so far as the reservations of industry associations concerning obligatory participation in emissions trading are actually aimed at ensuring that through the emissions trading system no additional burdens are imposed on companies, consideration could be made of conceding companies relief elsewhere. In this way, not only could experience be gathered with emissions trading in Europe, but the efficiency gains of emissions trading – compared with other instruments of greenhouse gas reduction – could also be secured.

2.2.4 Possibilities to opt-in

The question also arises, of whether, apart from the installations and companies obliged by the Directive to participate in the emissions trading system, other companies might voluntarily participate in emissions trading. Such companies could be interested because they want to gain early experience with emissions trading, or because they want to effectively communicate participation in emissions trading as part of their marketing strategy. Also those companies, which speculate primarily on being able to sell emission rights, could well have a heightened interest in emissions trading.

It would also be conceivable, that these companies likewise accept a reduction commitment and, analogous to companies obliged to participate, are accordingly allocated emission rights. On the other hand, it would also be possible, that the participation of other companies occurs on the basis of emission credits. In this case, companies participating voluntarily would have to accept baselines for their installations. If actual emissions later lie below the agreed baseline, the difference could then be disposed of as an emission credit. This procedure would be comparable with that for clean development mechanism projects within the framework of the Kyoto Protocol.

¹⁶ Klaus Lippold, from the Federation of Trade and Industry Associations in Hesse, argued for instance in that direction when, during the presentation of the Hesse simulated CO₂ emissions trading exercise, he complained that, despite voluntary commitments on the part of industry, European regulatory provisions have been further tightened up, resulting in increased costs for the companies concerned (Lamprecht 2001).

But first to the allocation of emissions rights: It is hardly likely that companies will voluntarily accept reduction commitments, for if they are unable to meet them through their own reduction measures, they would have to purchase additional emissions rights, which would involve further costs. Companies can also not speculate on their initial allocation of emission rights being so generous, that actual emissions will in any case be covered and rights remain over, which can be sold. This would amount to discrimination against those companies obliged to participate in the emissions trading system, and could also hardly be tolerated from the point of view of subsidy regulations.

The voluntary participation of further installations and companies on the basis of emission credits appears, in contrast, to be more promising. Where companies are unable to remain below an agreed baseline, no additional costs are imposed, because they have made no such commitment. On this basis it should therefore prove much easier to attract companies to voluntary participation in emissions trading.¹⁷

From an economic perspective, this provision would result in additional emission credits being supplied, whose production costs lie below the marginal avoidance costs of those companies obliged to participate in the emissions trading system. In the sense of an open system of communicating tubes, existing differences in avoidance costs would in this case be used to further cut marginal avoidance costs. This would mean that the aggregated costs of the whole system would turn out to be lower than with a system without the voluntary participation of companies from other as yet unregistered sectors. All in all, therefore, through this provision the efficiency gains of the emissions trading system could be increased. From an economic perspective, there is a lot to be said for such a provision.

In order to offer small- and medium-sized companies the opportunity to participate voluntarily in EU-wide emissions trading, it could be further considered, whether emission credits be supplied not directly to companies participating voluntarily, but rather through a fund.¹⁸ This fund would then assist small- and medium-sized companies in dealing with appropriate formalities and take over "distribution" of emission credits to those companies obliged to participate. As a result, the number of actors participating directly in emissions trading would remain manageable, and small- and medium-sized companies would be faced neither with incurring considerable costs for the installation of reporting and monitoring systems, nor with entering the presumably unknown and possibly also unfathomable business of emissions trading.

It would even be conceivable that, within the framework of a fund, emission credits could not only be bundled, but even put out to tender.¹⁹ Such a "competition for cost-efficient CO₂ reduction" has already been initiated in October 2001 by the environment authority of the city of Hamburg, with the support of HEW, BP and HWWA. One could therefore well imagine, that emission credits acquired within the scope of the tendering process could later be sold to those companies, who are obliged to participate in the emissions trading scheme.

In principle, there are various possibilities to enable the participation of further companies in emissions trading. But this is not currently provided for in the proposed Directive. And it is questionable, whether it makes sense to allow opting-in already in the pilot phase. For, as the

17 To avoid abuse, it must be ensured that actual emissions remain below the baseline in the long term, at least on average. Emissions above the baseline must therefore be deducted in the allocation of emission credits.

18 Initial consideration of the conditions of such funds has already been carried out at the Kreditanstalt für Wiederaufbau (KfW) and the Environment Ministry of the State of Hesse.

19 If the intention of tendering is to enable small- and medium-sized companies to participate in emissions trading, one could consider restricting participation in the competition to this business sector.

debate on the integration of project-based mechanisms (see Section 2.3) has shown, regulations for the precise determination of emission credits from such reduction projects are not yet developed to the extent, that these mechanisms can be considered right from the start of a European emissions trading system.

It is important for the environmental integrity of the system, that emission reductions of voluntarily participating companies result credibly from additional endeavours, and that measures, which are planned anyway, are not declared to be emission reductions. The formulation of clear-cut criteria for such additionality, as well as for the ascertainment of baselines, is methodically difficult, because scenarios are always put forward, which are of a hypothetical nature and not objectizable. In the case of climate negotiations on Clean Development Mechanisms, for instance, despite numerous proposals no agreement could be reached on criteria for verifying the additionality of emission reductions. Also with other environment policy instruments, such as the promotion of combined heat and power for instance, controversial debates on reference systems take place over and over again.

Even when restrictive regulations for the verification of additionality and the ascertainment of baselines are put forward, it has to be assumed in the case of the voluntary participation of additional companies, that a certain proportion of emission reductions is not additional, and that as a result emission reduction targets are to a certain extent diminished. This could then prove to be problematical, if the trading system is intended to be fully compatible with the emissions trading system under the Kyoto Protocol. A further shortcoming derives from the fact that appropriate verification processes result in additional transaction costs, through which the attractiveness of this model is reduced. The benefit with respect to economic efficiency has to be compared with the shortcomings regarding environmental integrity and transaction costs.

Because the voluntary participation of additional companies on the basis of emission credits depends on generally accepted regulations for the calculation of emission credits, the possibility of opting-in should only then be conceded, when project-based mechanisms are allowed for in the European emissions trading system.

2.3 Project-based mechanisms

Within the framework of the European emissions trading system, emission credits from project-based mechanisms (Joint Implementation and Clean Development Mechanism) could on principle be recognized without restriction or subject to certain limitations. The unrestricted consideration of emission credits from Joint Implementation (JI) and the Clean Development Mechanism (CDM) is hardly a possibility, however, because within the framework of the UNFCCC detailed regulations concerning the recognition of project mechanism credits do not at present exist.

At the Seventh Conference of the Parties to the Convention in Marrakech, a ten-member Executive Board of the CDM was appointed, which is authorized to develop methods for baselines, monitoring plans and project limits, which it will then submit to conferences of the Parties to the Convention. It is also empowered to accredit operational bodies, and to develop and operate a CDM register (UNFCCC 2001). But just which of the Executive Board's detailed regulations will ultimately be recognized, will probably not be apparent before 2003.

Also in the case of JI, important questions (for example, the recognition of baselines) have not yet been finally resolved. Because, within the framework of the UNFCCC, emission credits from JI projects will anyway be recognized only with effect from the first commitment period, it can be expected that final clarification of these questions will still require some time.

Restricted recognition of JI/CDM credits within the framework of the European emissions trading system can relate not only to the scope but also to the quality of these emission credits. It is possible, that JI and/or CDM credits will only be recognized up to a particular share of total reduction or stabilization commitments, or that only certain project categories (positive list) will be recognized. This way, it can be ensured that a particular share of necessary greenhouse gas reductions is realized in EU Member States and not in countries with economies in transition or in developing countries. Because it can be assumed, that marginal avoidance costs in these countries are lower than in the EU, such a regulation would give rise to higher greenhouse gas reduction costs than an emissions trading system without such restrictions.

This debate is comparable to that, which was conducted within the framework of the UNFCCC on the issues of complementarity and ceilings. In this connection the demand was made, in particular by the EU, that the use of flexible mechanisms be limited, in order that the reduction and stabilization commitments of individual Member States be fulfilled, at least to a considerable extent, through policies and measures in their own countries. The reason given for this demand, was that only in this way could the early changeover on the part of industrialized countries to a climate-friendly economic system be ensured. It did not prove possible to enforce this demand internationally as a binding obligation with concrete targets. On the contrary, the Parties to the Convention now have merely to report in qualitative terms on the extent to which they fulfil required emission reductions through domestic measures. Because the European emissions trading system is intended to serve as a pilot project for international greenhouse gas trading within the framework of the UNFCCC, it would make little sense to introduce a regulation that will later have no practical significance.

It would also be conceivable, that the rules laid down by the UNFCCC for the generation of emission credits from CDM or JI projects would not be regarded by the EU or individual Member States as adequate, and that as a result only those credits would be recognized for the fulfilment of commitments, which meet the stricter EU requirements for CDM and JI projects. The enforcement of stricter criteria would be possible during the preliminary phase, but later, in international greenhouse gas trading, such a regulation could be easily circumvented and therefore be ineffective or even superfluous. For if EU Member States are barred from acquiring emission credits that do not correspond with stricter EU criteria, these credits could then be acquired by other Annex I States, which could then sell emission rights from their own supplies to EU Member States. JI or CDM projects, which could endanger the ecological integrity of the Kyoto Protocol, cannot be precluded by this regulation.²⁰ The only effect of the regulation would be that the interposing Annex I State receives a commission, which cuts its reduction costs, while in the EU, aggregated reduction costs are increased to the extent of the provision to be paid.

A divergent qualitative restriction of project mechanism credits therefore also makes little sense. Instead, in the further formulation of criteria for the recognition of project mechanism credits, it is advisable for the EU and its Member States to ensure, that the ecological integrity of the Kyoto Protocol is not limited by regulations that are too weak or imprecise.

But if the ecological integrity of the Kyoto Protocol and, at the same time, later compatibility with regulations within the framework of the UNFCCC are to be ensured, then, in the development of an emissions trading system to take effect before the first commitment period, the

²⁰ This then applies, when in the European emissions trading system – as provided for in Article 24 (COM(2001) 581) – emission rights from other countries are recognized. Within the framework of international emissions trading, the stricter EU provisions for emission credits from CDM and JI projects could in this way be circumvented during the first commitment period.

following dilemma must be resolved: The adoption of a Directive and its implementation in Member States require a certain period of preparation, that so far as commencement in 2005 is concerned, is even now too short. If the introduction of an emissions trading system is made dependent on necessary clarity being achieved in the recognition of project-based mechanisms in the international negotiating process, then there possibly remains inadequate time to adopt and implement the planned system within the EU.

Although the EU Commission (COM(2001) 581), just as the Federal Government (BMU 2001), regards the consideration of emission credits from CDM and JI projects as desirable, also in a preliminary phase before the first commitment period, the current draft Directive does not provide for consideration of project mechanism credits. Instead, the immediate integration of these emission credits into the emissions trading system is aimed for in a further Directive (COM(2001) 581).²¹ In this way it can be ensured, that the legislative process for the introduction of the emissions trading system as a whole is not delayed, and that the earliest possible consideration of emission credits from CDM and JI projects is made possible. The temporary exclusion of emission credits therefore results not from fundamental issues, but solely against the background of pragmatic considerations. At the same time, it is by no means completely ruled out, that already with effect from 2005 emission credits from CDM and JI projects could be recognized in the European emissions trading system, provided that within the framework of UNFCCC remaining issues can be more speedily resolved, than is presently foreseeable. Should the resolution of these issues be further delayed, it must then be expected that project mechanism credits cannot be recognized within the framework of the European emissions trading system before 2006 or 2007. It can be assumed, in any case, that the adoption and implementation of a Directive on the recognition of CDM and JI projects within the framework of a European emissions trading system, requires less time than the setting up of the emissions trading system as a whole.

Everything points to the fact, that the approach chosen by the EU Commission, in connection with the consideration of project-based mechanisms of the Kyoto Protocol is a well-balanced compromise between what is desirable and existing restrictions. In this respect too, the proposed Directive is fully supported. Amendments or additions are, in our opinion, not currently required.

2.4 Consideration of other greenhouse gases

The proposed Directive includes all greenhouse gases in the Kyoto Protocol (COM(2001) 581, Annex II). Nevertheless, in the preliminary phase only CO₂ emissions are considered. This is laid down in the definition of listed activities (COM(2001) 581, Annex I). The Commission justifies this with the argument, that more than 80% of greenhouse gas emissions in the EU relate to carbon dioxide (CO₂), and that CO₂ emissions can be well monitored and controlled. The inclusion of other greenhouse gases (CH₄, N₂O, HFC, PFC, SF₆) would also be desirable, but cannot be realized in the initial phase of the emissions trading system on account of current imprecision in the monitoring of these gases. The inclusion of other greenhouse gases should therefore occur later, within the framework of a revised version of the

21 Because emission credits, which have been generated in CDM projects since the year 2000, can be used in the first commitment period of the Kyoto Protocol, it would have to be ensured that, in recognizing emission credits from CDM in the preliminary period of the EU-wide emissions trading system, the credits used as evidence for commitments from the preliminary phase cannot be applied a second time during the first commitment period of the Kyoto Protocol, for instance through transfer to a so-called cancellation account.

Directive, at such time when monitoring problems can be regarded as adequately resolved (COM(2001) 581).

Although this reasoning can at first be followed, the question remains, whether this ruling presents individual Member States with advantages or disadvantages. One could imagine that countries, whose share of CO₂ emissions, compared to total greenhouse gas emissions, lies below the EU average, would be disadvantaged, because in these countries a larger proportion of greenhouse gas emissions is excluded from EU-wide emissions trading than in other Member States. This is the case in Ireland, for instance, where in 1998 only around 68% of greenhouse gas emissions related to CO₂.²² Bearing in mind, however, that the unlisted emissions are above all CH₄ and N₂O emissions, which for the most part occur in agriculture, the fact is that these emissions, even if all greenhouse gases had been included, would still not have been covered, because of the sectoral limitation of the emissions trading system.

Furthermore, non-CO₂ emissions in agriculture would presumably also have been excluded from EU emissions trading because of de minimis limits. For only a few enterprises among the often small-scale agricultural units in these countries might give rise to greenhouse gas emissions to the order of combustion plants larger than 20 MW.

For the pilot phase, the Federal Government has proposed that participating business enterprises should be free to consider CH₄ and N₂O, as long as they can provide evidence of reliable and precise inventories of emissions (BMU 2001). This proposal is inconsistent. For at the present time there is a lack of dependable assessment criteria to be able to determine, whether inventories of emissions drawn up by business enterprises are reliable and precise. Were such criteria to be available, other greenhouse gases could basically be considered from the very beginning in the emissions trading system.

In summary it may be said, that the approach chosen by the EU Commission in its proposed Directive is quite sensible and balanced. On the one hand, greenhouse gases are dealt with in such a manner as to ensure, that a market of sufficient liquidity can be established for efficient emissions trading. On the other hand, those greenhouse gases are excluded, for which precise monitoring and control are not at present possible. As a result, the system is straightforward and manageable, particularly in the pilot phase. Beyond this, the options for extending the system to cover all greenhouse gases are already contained in the proposed Directive. This underlines the serious intention to further develop the emissions trading system. Amendments to this aspect of the Proposal are in our opinion not at present necessary.

2.5 Regulatory overlapping

Innumerable climate-related regulations exist in the EU, which can overlap the effects of emissions trading. They range from regulatory provisions (such as efficiency standards) and taxes to counter-productive measures from the perspective of climate protection (such as coal subsidies). The American acid rain programme has shown, that through regulatory overlapping the functionality of the market in certificates can be reduced. In the USA, a number of States impose stricter limit values for the emission of SO₂ than those laid down at a national level. As a result, potential buyers of emission rights became sellers, leading to the situation that, apart from the resultant reduction in price, efficiency gains could not be completely exhausted.

22 Apart from Ireland, Spain and Portugal also have below-average CO₂ shares. In France, Denmark, the Netherlands and Sweden CO₂ shares are just below the EU average.

Within the framework of this Opinion, examples should be made of the following three points:

- Voluntary commitments on the part of industry
- Ecotax
- Promotion of renewable energies

In each case the questions will be addressed, to what extent coexistence of policy instruments with emissions trading appears to be sensible, and which conflicts can arise.

2.5.1 Voluntary commitments

In climate protection, voluntary commitments have the drawback, that in the main they formulate not absolute but rather only specific targets. Environmental agreements based on efficiency targets bear a risk with regard to the fulfilment of ecological objectives, because an unexpectedly high level of activity – namely, unexpected macro-economic, sectoral or company-specific growth – can lead to unforeseen additional ecological burdens, even when target values per product unit are met. Environmental effectiveness is also endangered by the fact that voluntary commitments are not, as a rule, legally binding. Where the failure to meet targets threatens, one cannot revert to mandatory instruments of enforcement. Free-rider problems between companies of a particular sector will make it difficult for industry associations to push through an environmental agreement that threatens to fall short of its target. And because its instrumental formulation is generally open, one can only speculate on its efficiency. Reduction achievements result on the basis of internal – that is, agreed within the industry association or sector – reduction commitments. No price signal is generated, to which individual businesses can align their reduction decisions. Information on ensuing costs is rarely available, let alone publicly accessible. The process is characterized by a considerable lack of transparency.

In contrast, within the scope of an emissions trading system a market is established, on which allowances can be traded. The price is determined according to supply and demand. Compared with voluntary commitments, trading offers the advantage, that it makes available information on costs transparent, and allows, as a result, the equilibration of marginal abatement costs. Moreover, the Directive also allows the possibility to purchase allowances where the target laid down in the agreement is not achieved, as well as the sale of surplus allowances in the contrary case. Apart from improved transparency, trading also offers greater flexibility.

For the six sectors listed in the Directive, voluntary commitments also exist on the part of the corresponding industry associations. Because the undertakings contained in environmental agreements relate to quantities (relative or absolute), they can be made use of as points of reference for the determination of target values within emissions trading, provided that these targets are in line with requirements arising from the national allocation plan. The proposed Directive leaves open the possibility, within the EU-wide system, of applying "relative targets" at a national level. Because the trading unit relates to one tonne of CO₂ equivalent, these relative values have to be converted. For this purpose, forecasts on output levels can be used, for instance.

Under these circumstances, existing voluntary commitments can continue, and be adjusted in such a way, that allowances, allocated to or acquired by industry association members during the course of emissions trading, are taken into account in evidencing target fulfilment.

Such parallelism of environmental agreement and emissions trading is explicitly provided for in the Directive, to the extent that industry associations, acting on behalf of participating companies, are themselves able to trade on the market.

2.5.2 Ecotax

Taxes – like allowances – provide utilization of the environment with a uniform price, to which all emitters can align their decisions. They can choose whether they will pay the appropriate taxes or invest in emission reduction measures. This also involves, as a rule, considerable flexibility with regard to timing. Emitters can precisely relate the timing of their investments to their specific circumstances. With the tax solution, however, the ecological effect is difficult to calculate, and precise "landing" at a predetermined target difficult to achieve (the reasons: lack of information on abatement costs in a national economy, and changing general economic conditions, such as the rate of economic growth and technological progress). This might make an adjustment of tax rates necessary.

Where, in one country, an industrial sector is subject not only to a tax (for example, on energy consumption), but also to CO₂ emission trading, this leads to the situation that, in relation to a tax-free case of reference, the demand for allowances falls, or supply expands, and the result is a reduction in price on the CO₂ market. The German ecotax increases the cost of energy consumption, resulting in diminished energy demand. Reduced emissions are the consequence. These reductions are made available to the CO₂ emissions market free of charge, as it were. Whether the efficiency gains of "pure" emissions trading – that is, in the absence of taxation – can be fully exhausted, depends on prevailing price elasticity. It has to be emphasized however, that the choice of an adequate instrument mix depends on political targeting. Were the sole target to be a reduction in CO₂, pure emissions trading would be the preferred instrument and the coexistence of taxes and allowance trading avoided. However, the CO₂ target is just one of many in this area, and these targets are not effective independent of each other. The reduction of energy consumption is not only motivated by considerations of climate policy, but is targeted, among other factors, for reasons of local pollutant reduction and resource conservation. Parallelism of taxes and emissions trading can thus be quite sensible, and should not be excluded as an option from the very beginning.

It is often argued with regard to the international competitiveness of business, that the introduction of emissions trading leads to costs that are no longer tolerable. The Commission responded to this criticism by initially laying down "grandfathering" as a method of allocation. Companies do not have to pay for all their emissions, but rather only for that part, for which they themselves hold no rights and avoidance would be too expensive. In the German ecotax context, energy-intensive sectors listed in the Directive further benefit from special arrangements in the form of reduced tax rates.²³ The German ecotax was also largely structured on a zero revenue basis. Emissions trading would therefore affect particularly those companies, which have previously enjoyed special arrangements under the ecotax regime, so that there can be no talk of a major additional burden. This might well occur in individual cases, but at the same time there will also be companies that profit from the sale of spare allowances on the market. The position of each individual company – net winner or net loser – depends to a decisive extent on its initial allocation and its own avoidance opportunities, but not ex ante on implementation of the new policy instrument.

23 Manufacturing industry receives, for example, a reduction of 80% of the basic tax rate. Beyond that, top rate relief is granted, when the burden of increased tax rates (excluding mineral oil tax on fuel) exceeds the reduction in pension contributions by a factor of 1.2. Excess amounts are reimbursed to companies in full, on request. These exceptions were granted on account of voluntary commitments on climate protection on the part of German industry. The approval of the Commission was, however, limited to the period up to March 2002 (see also Footnote 24).

Emissions trading could also be applied as a follow-up regulation, in order to end discussions between the Commission and the Federal Government on special arrangements with regard to ecotax.²⁴ In such a case, installations participating in emissions trading should be exempted from ecotax, to avoid overlapping and distortions. From the perspective of climate policy, the laying down of quantitative targets for companies in the course of emissions trading makes an ecotax obsolete.

2.5.3 Promotion of renewable energies

A situation similar to that with ecotax is found with the promotion of renewable energies. Through the development of this energy source, CO₂ emissions are avoided, which no longer have to be achieved elsewhere in order to attain the national reduction target. These reductions are also made available to the CO₂ emissions market more or less free of charge.²⁵

Because of the binding reference to installations and the approach to direct emissions, renewable energies do not derive direct support from the proposed Directive.²⁶ An energy supplier, which produces energy from both fossil and renewable energy sources, can only release rights from emission reductions with fossil installations through limiting production (level of activity) or through a change of fuel (for example, from coal to gas, or to renewable sources). It could only draw a limited direct benefit from the shutdown of fossil installations in the form of spare allowances, because following shutdown it will in all probability only be allocated emission rights up to the end of the current budget period (dependent on the precise future formulation of the Directive – see Section 2.1.2). An independent operator of a wind park profits only indirectly from the introduction of emissions trading.²⁷ Business-related CO₂ reduction targets provide renewable energy with a comparative economic advantage, because energy from fossil power stations is burdened with the costs of emission reduction.²⁸

Because renewable energies are not covered by the Directive, and as a result do not receive direct support, the coexistence of emissions trading and the promotion of regenerative energy sources appears quite justified, particularly as with regenerative sources, apart from climate

24 The EU Commissioner for competition policy, Mario Monti, announced at the end of 2001 that under prevailing conditions the exemption, due to expire at the end of March 2002, would not be extended. At the end of 2001, agreement was reached, however, between the Federal Government and the Commission on most points, and the greater part of tax relief for German industry extended to 2012. But no agreement was reached on the question of top rate relief (FÖS 2002). Against this background, the application of emissions trading as a follow-up regulation seems no longer necessary.

25 This applies of course only for the isolated consideration of the CO₂ emissions market. With the development of renewable energies, CO₂ reductions occur as a joint product. The provision of power from renewable energies is in the end supported by final consumers in the form of higher electricity prices. "Beneficiaries", in this case, are the obligatory participants in the emissions trading system, because the reductions achieved through the development of regenerative power no longer have to be produced in their sector. From this perspective, possible repercussions of the development of renewable energies on obligatory participants in the emissions trading system are disregarded altogether, which can result in additional costs on the part of companies covered by the Directive, for example in the form of failing demand.

26 The Federal Government's Renewable Energies Act (Erneuerbare-Energien-Gesetz - EEG) limits the support of hydro-power to a maximum of 5 MW. Hydroelectric power plants with an installed electric capacity in excess of 5 MW therefore receive direct support from neither the EEG nor the proposed Directive.

27 It is conceivable, that operators of such installations will be incorporated into the trading system in the planned Directive on project-based mechanisms. Investments in renewable energies within the EU could be treated analogous to projects in non-EU countries (countries with economies in transition and developing countries). On account of the promotion of these energy sources and the declared EU goal of doubling their share of primary energy consumption from the current level of 6% to 12% in 2010 (COM(1997) 599), problems might arise regarding proof of the additionality of these measures.

28 If proceeds from an auction are not entirely redistributed to the companies involved, this economic advantage would be greater with the auctioning of emission rights than with their free allocation.

protection other targets play a role (for instance, resource protection). The comparative economic advantage derived from the implementation of trading in allowances, will hardly suffice to enable renewable energies to become competitive. The distinction is also evident in the fact, that development targets for renewable energies have to be explicitly considered as a criterion in drawing up national allocation plans.

2.6 Electricity generation

2.6.1 Direct or indirect apportionment of greenhouse gas emissions

In the period before publication of the proposed Directive the question was discussed, in connection with electricity generation, whether in the case of a downstream approach the principle of direct or indirect apportionment of emission should be pursued:

- In the case of direct apportionment, emissions from electricity generation are recorded at the place of combustion. Operators of power plants with a capacity in excess of 20 MW are obliged to provide appropriate evidence.
- In the case of indirect apportionment, emissions are recorded at the place where electricity, as the end product of the combustion process, is consumed.

Both types of apportionment have advantages and disadvantages. From the point of view of practical aspects of implementation, the direct apportionment of emission is certainly the simpler and more practicable method, because here, in contrast to indirect apportionment, the assigning of an emission factor for electricity is unnecessary. It also has the result, that not only electricity consumption in industry, but also electricity consumption in all other sectors of the economy is covered by the emissions trading system. With regard to the emissions recorded, this is certainly an advantage.

In the case of indirect apportionment, emissions are recorded not at the place of combustion, but where they are ultimately caused, namely at the electricity consumer. This approach is justified by the argument, that in this way stronger orientation is expressed to the polluter-pays-principle. In addition, with this method it can be decided whether total electricity generation is covered by the emissions trading system, or merely the energy consumption of those industrial sectors that are otherwise covered by the emissions trading system.

Because, however, with the consumer it can no longer be distinguished, whether electricity consumed comes from a brown coal power station with heavy CO₂ pollution, or from a wind power plant, that is operated without the emission of carbon dioxide, the question arises, which emission factor should be apportioned to the respective electricity consumption. If average emission factors are applied, this will have the result, that the incentive to exploit reduction potentials in electricity generation, either through a change of fuel, the use of renewable energy sources, or efficiency improvements, has only an indirect effect. The individual electricity generator would have practically no advantage from such optimization, because in a liberalized electricity market it cannot pass on the resultant costs to its customers. As a consequence, such reduction options are not exploited. There only remains the increased incentive on the part of the consumer to use as little electricity as possible, or to carry out measures to reduce electricity consumption. This incentive, however, also exists with the direct apportionment of emissions, because energy suppliers can pass on additional costs arising from reduction commitments to their customers.

In the Federal Government's formal opinion on the proposed Directive, attention was drawn to the fact, that the application of average degrees of efficiency and energy mix could give rise to legal problems, because energy suppliers with an efficient power plant park, or with a

high proportion of regenerative energy sources in their generation portfolio, would be discriminated against, since their comparatively low emissions were not given special consideration in the allowances obligation of electricity consumers (BMU 2001). This argument, however, can only be followed in part. In the case of indirect emission apportionment for electricity, no electricity generator would fall under the emission allowances obligation. They are therefore not covered by the whole emissions trading system. Because their relative competitive situation does not change, the charge of discrimination is inappropriate. Producers of regenerative energy could regret that they are not directly covered by the emissions trading system, because as a result they cannot assert their specific competitive advantage. But they are not disadvantaged or discriminated against.

These problems of emission apportionment could be avoided, if the specific "greenhouse gas quality" of electricity consumed could be more precisely determined. Such a way of proceeding would be possible, if proof of origin of electricity could be reliably established. This question is currently being discussed under the catchword disclosure in different States in the USA, in certain European countries and in the EU itself (COM(2001) 125 final). Austria has meanwhile even enacted a law on the subject, which has been in effect since October 2001 (§ 45 EIWIG).

The background to such developments is to be found in the fact that, as a result of the liberalization of electricity markets, consumers now have the opportunity to choose their electricity. Although electricity in itself is a relatively homogeneous product of precisely defined quality, the various forms of electricity generation give rise to very different environmental problems. In the interest of consumer sovereignty, consumers must therefore be provided with reliable information on the manner of production of the electricity they use. Only then can it be expected, that the consumer assume responsibility for the environmental pollution or emission he or she causes. These developments can therefore also be understood as a contribution towards increased societal implementation and permeation of the polluter-pays-principle. Furthermore, by means of complete disclosure the objective is also pursued – for example in Austria – of closing the European market to so-called "dirty" or risk-ridden electricity, especially from eastern Europe.

The debate on disclosure cannot be extensively discussed here. It shows, however, that the indirect apportionment of greenhouse gas emissions is basically realizable. At the same time it also shows, that indirect apportionment, in comparison to direct apportionment of emissions, is without a doubt the more complicated and costly procedure.

The question also arises, why the debate on the direct and indirect apportionment of emissions is conducted just in connection with electricity. If the indirect apportionment of emissions is proposed for electricity, it could also – in the interest of a uniform and consistent approach – be proposed in the case of cement, that emissions not be attributed to the cement industry, but rather to the construction industry, or the private house builder. The same applies to steel and metals, glass, paper and board, etc. At least at this point it becomes clear, that the indirect apportionment of emissions is beset with considerable problems of application. The transaction costs of indirect emission apportionment can therefore quickly exceed the efficiency potential attainable through emissions trading, which would stand the whole approach on its head.

It therefore seems very likely, that the direct apportionment of emissions is not only the more practicable, but also the more efficient method. It is also congruent with the approach contained in the Kyoto Protocol. For the Kyoto Protocol is founded on the principle of territoriality and thus the direct apportionment of emissions, and not on the polluter-pays-principle that is based in turn on the indirect apportionment of emissions. Also against the background of

compatibility with international emissions trading among Annex I States, the direct apportionment of emissions proves to be the more appropriate approach.

Furthermore, where direct and indirect apportionment of emissions are applied concurrently, there is the danger of double counting of emissions or emission reductions. This problem does not arise, when one or other of the methods is applied systematically. For this reason, the consistent approach of the Commission in strictly pursuing the registration of direct emissions it to be welcomed.

All in all, the procedure selected by the Commission in the proposed Directive can only be confirmed. From the point of view of practicability and efficiency, the direct registration of emissions from electricity generation is the more appropriate procedure, and it is also congruent with the Kyoto protocol, which is of particularly significance for the future integration of the European emissions trading system with international emissions trading among Annex I countries.

2.6.2 Consideration of electricity generation from combined heat and power.

Combined heat and power (CHP) results in a very high rate of efficiency, which in the most effective plants can reach values over 90%. From the energetic point of view, combined heat and power is therefore the most efficient method of utilizing fossil energy sources. Not least for this reason, combined heat and power plays an outstanding role in the German climate protection programme. At least 10% of the reduction of 90 to 95 million tonnes of CO₂, which has still to be achieved by 2005, is intended to be covered solely by the expansion of combined heat and power (BMU 2000).

Because CHP plants are combustion plants, however, they are also subject to the obligation to dispose of emission allowances. Under certain circumstances, this raises problems of competition on the heating market. Because in CHP plants not only power but also heat is produced, operators of such plants are active on two markets – those for electricity and heat.

On the electricity market around 80 to 85% of electricity generation is covered by the emissions trading system. Only smaller power stations²⁹ and regenerative energy sources³⁰ are not covered. The former are mostly small CHP plants (block heat and power plants, gas turbines) with, as a rule, above-average rates of efficiency; the latter generate electricity without direct greenhouse gas emissions. From the climate and environment points of view, both types of plant are therefore worthy of support. The fact that they are not covered by the emissions trading system, improves their relative competitive position on the electricity market, because they are not obliged to dispose of emission allowances. The operators of CHP plants with a thermal capacity in excess of 20 MW, on the other hand, occupy a relative competitive position on the electricity market similar to that of the operators of conventional fossil power sta-

29 Data is available neither for Germany nor for the EU for electricity generation from thermal power stations with a thermal capacity of less than 20 MW. In Germany, power stations with an electrical bottleneck capacity of less than 20 MW have a share of under 1 per cent in public electricity generation (VDEW o. J.). The share of power stations with a thermal capacity of less than 20 MW is consequently even lower. In electricity generation in industry, the share of smaller power stations is considerably higher. Because, however, the share of electricity generated in industry in total electricity generated, in relation to bottleneck capacity, lies only around 10% (DESTATIS 2001), this fact has little effect on the share of smaller power stations in total power station output in Germany. In Europe as a whole, the relation is not likely to be fundamentally different, so that on the whole it can be assumed, that the share of small thermal power stations in electricity generation lies considerably under 5%. It can be expected in the future, that decentralized electricity generation with small power stations will gain in importance.

30 Renewable energy sources, including hydropower, currently have a share of approximately 14% in electricity generation in Europe (EUROSTAT 2001).

tions. Provided they use fuel that is less greenhouse-gas-intensive, or possess highly-efficient plants, their competitive position on the electricity market might even improve.

The situation on the heating market is different however, because heat from CHP installations is likely to have to compete with supplies that are not covered by the emissions trading system. This is the case, for instance, when heat from CHP installations is fed into district heating systems.³¹ District heating supplies compete here with heat from gas-fired condensation boilers, for instance, that are not obliged to dispose of emission rights.

According to the present draft Directive, however, the overall use of fuel in combustion plants is subject to the emission rights obligation. The competitive position of heat from CHP plants would thus be considerably worsened.³² Because, on account of more competitive alternative supplies, the additional costs of emission rights for the heating portion can be passed on neither on the electricity nor on the heating market, the deterioration in competitiveness is at the cost of profit, with the consequence that CHP plants as a whole could become uneconomic and might even have to be shut down. The introduction of an EU-wide emissions trading system therefore has the result, that CHP plants, which are beneficial from the climate protection perspective and are classified as worthy of support by the EU, are disadvantaged and might even have to be shut down. The present draft Directive thus leads to unintended side effects in the form of discrimination against CHP plants with a thermal capacity exceeding 20 MW.

The proposed Directive should therefore be amended in respect of the inclusion of CHP plants. A possible solution would be, that the share of fuel in CHP installations used for the production of district heating be exempted from the emission rights obligation. From the administrative viewpoint this procedure would be relatively easy to carry out, because only turnover in district heating would have to be ascertained and verified. The proportion of fuel to be exempted from the emission rights obligation can then be determined in connection with a certified rate of efficiency of heat generation of the CHP plant.

A similar procedure is pursued in the Danish emissions trading system for CO₂ quotas in electricity generation. Heat generation in CHP plants is here also exempted from the quota obligation (DP 1999, Bill 235, Section 2(2)). In the Danish system, however, heat generation is not measured, but calculated on the basis of an average CHP coefficient³³ of 0.5 (heat rate 200%). This reduces the administrative cost of monitoring, but can also result in the preferential treatment of CHP plants, which can also be operated as condensation plants (extraction-condensation plants), if these are predominantly operated as condensation plants, and as a result achieve considerably lower CHP coefficients on yearly average. From that point of view, excepting heat generation, on the basis of measurements of district heating input, might be the more appropriate approach for European emissions trading, particularly as the resulting amount of time expended on monitoring CHP plants is low.

As an alternative to exempting fuel input for the generation of district heating from the emission rights obligation, a free and complete allocation of emission rights for this portion of fuel input could be considered. The volume of the emission rights market would in this case be somewhat larger, which would be advantageous for the liquidity and efficiency of emissions trading. Furthermore, in this case the operators of CHP plants could also optimize heat gen-

31 Every municipal utility, which feeds heat from CHP installations into its district heating system, is in such a situation.

32 This also applies with the allocation of emission rights according to the grandfathering principle. For in this case it can be assumed, that actual emissions from the installation are not fully covered by the allocated rights, because through the limited allocation of emission rights a reduction in emissions is intended to be achieved.

33 The CHP coefficient is the relation of electricity to heat generation, determined on the basis of the technical configuration of the plant. An CHP coefficient of 0.5 indicates that per kWh of heat 0.5 kWh of electricity is generated.

eration and refinance the resulting costs through the disposal of surplus emission rights. All in all, the free allocation of emission rights for the fuel input necessary for the provision of district heating, appears to be slightly more beneficial than exemption from the emission rights obligation.

In any case, however, amendment of the Directive with regard to the inclusion of CHP plants is absolutely essential. Otherwise, it will have to be accepted, that a number of environment- and climate-friendly CHP plants will be shut down following introduction of emissions trading in Europe.

3 Bibliography

- AGE [Arbeitsgruppe Emissionshandel zur Bekämpfung des Treibhauseffekts] (2001): Materialband Phase I. 05.12.2001, <http://www.ag-emissionshandel.de/>.
- Bergmann, Heidi (2002): Personal communication on 23.01.2002 with Professor Dr. Heidi Bergmann (Professor of international environmental law at the Mannheim College of Higher Education).
- BMU [Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit] (2000): Nationales Klimaschutzprogramm. In: Umwelt 11/2000 - Sonderteil <http://www.bmu.de/download/dateien/klimaschutzprogramm2000.pdf>.
- BMU [Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit] (2001): Stellungnahme der Bundesregierung zur Einführung eines EU-weiten Handels mit Treibhausgasen - Positionspapier für die Diskussion mit der Europäischen Kommission am 10.09.2001, http://www.bmu.de/sachthemen/emission/stelln_bundesrg.php.
- BMWi [Bundesministerium für Wirtschaft] (2001): Wirtschaftsministerkonferenz – Ergebnis der Amtschefkonferenz am 30. Oktober 2001 – Punkt 6 der Tagesordnung – Marktwirtschaftliche Instrumente der Klimapolitik. Protokollnotiz.
- CNE [Climate Network Europe] (2001): Emission Trading in the EU: let's see some targets! 12/20/01.
- DESTATIS [Statistisches Bundesamt] 2001: Statistisches Jahrbuch 2001 für die Bundesrepublik. Wiesbaden.
- DP [Danish Parliament] (1999): Bill no. 235 on CO₂ Quotas for Electricity Production. http://www.ens.dk/uk/energy_reform/bill_no_235.htm.
- eurostat (2001): Renewable energy sources statistics in the European Union - Data 1994 - 1998. Luxembourg.
- FÖS [Förderverein Ökologische Steuerreform e.V.] (2002): ÖkosteuerNews 5 - Januar 2002. Nachrichten und Diskussionsbeiträge zur Ökologischen Steuerreform. <http://www.foes-ev.de/2newsmit/index.html>.
- Koschel, H., K.L. Brockmann, T.F.N. Schmidt, M. Stronzik und H. Bergmann (1998): Handelbare SO₂-Zertifikate in Europa. Heidelberg.
- Lamprecht, Franz (2001): CO₂-Emissionshandel. In: enegiewirtschaftliche tagesfragen, Oktober 2001 (Heft 10).
- StBA [Statistisches Bundesamt] (2001): Umweltökonomische Gesamtrechnungen 2000. Wiesbaden.
- UNFCCC [United Nation Framework Convention on Climate Change] (2001): The Marrakesh Accords and the Marrakesh Declaration, Advance unedited version, modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol.
- UVM [Ministerium für Umwelt und Verkehr Baden-Württemberg] (2000): Der Handel mit Treibhausgasemissionen in der Europäischen Union. Diskussionsbeitrag zum Grönbuch. Stuttgart.
- VDEW [Vereinigung Deutscher Elektrizitätswerke e.V.] (o. J.): VDEW-Statistik 1998 – Leistung und Arbeit. Frankfurt.
- Vis, Peter (2001): Personal communication on 04.12.2001 with Peter Vis (staff member of the Climate Change Unit in the DG ENV, who was involved in the preparation of the proposed Directive).
- Vis, Peter (2002): Personal communication on 24.01.2002 with Peter Vis (staff member of the Climate Change Unit in the DG ENV, who was involved in the preparation of the proposed Directive).