

**National Allocation Plan  
for the  
Federal Republic of Germany  
2005-2007**

Federal Ministry for the Environment,  
Nature Conservation and Nuclear Safety

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**Annex I: Cabinet Decision of 31/03/2004**

**Annex II: Amendments to the National Allocation Plan  
following the National Allocation Plan Act**

## **A. Basic structure of the National Allocation Plan**

### **1. Requirements of the EU Emissions Trading Directive**

On 13 October 2003 the European Parliament and the Council of the European Union adopted a Directive for establishing an emissions trading scheme in Europe, which took effect on 25 October 2003.<sup>1</sup> This Directive applies to such energy-intensive installations as fall within activities specified in its Annex I. Of the six greenhouse gases named in the Kyoto Protocol and listed in Annex II of the Directive, Annex I initially restricts its field of reference to carbon dioxide (CO<sub>2</sub>). This means that emissions trading in the first trading period 2005-2007 will be confined to CO<sub>2</sub> emissions.

Article 9 of the Directive requires each Member State to publish a National Allocation Plan by 31 March 2004 and to notify it to the EU Commission and the other Member States. The National Allocation Plan (NAP) must indicate how many emission allowances the Member State intends to issue altogether during the three-year period 2005–2007 and how these allowances are to be distributed to the installations subject to emissions trading. Art. 10 of the Directive provides that Member States must allocate at least 95% of allowances for this period free of charge. The German government will allocate 100% of its allowances free of charge.<sup>2</sup> The Allocation Plan must fulfil the general criteria described in Article 9 of the Directive (Box 1) and the criteria outlined in Annex III of the Directive (Box 2). On 7 January 2004 the Commission submitted guidelines for applying the criteria in Annex III. The present Allocation Plan has taken these into account.

In line with Art. 11 of the Directive, the decision allocating allowances to plant operators must be taken at least three months before the relevant trading period begins, which in the case of 2005–2007 means by 30 September 2004. The allowances will be issued in annual tranches by 28 February of the year in question. The allowances can then be traded freely within the EU.

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

<sup>2</sup> To cover the administrative expenses incurred, the government will merely charge for the issue and distribution of certificates and for costs arising in connection with maintaining the Registry.

*Box 1 Article 9 requirements for the National Allocation Plan*

“For each period (...) each Member State shall develop a national plan stating

- the total quantity of allowances that it intends to allocate for that period and
- how it proposes to allocate them.

The plan shall be based on objective and transparent criteria, including those listed in Annex III, taking due account of comments from the public (...)”

*Box 2 Criteria for the National Allocation Plan in Annex III of the Directive*

1. The total quantity of allowances to be allocated for the relevant period shall be consistent with the Member State's obligation to limit its emissions pursuant to Decision 2002/358/EC and the Kyoto Protocol, taking into account, on the one hand, the proportion of overall emissions that these allowances represent in comparison with emissions from sources not covered by this Directive and, on the other hand, national energy policies, and should be consistent with the national climate protection programme. The total quantity of allowances to be allocated shall not be more than is likely to be needed for the strict application of the criteria of this Annex. Prior to 2008, the quantity shall be consistent with a path towards achieving or over-achieving each Member State's target under Decision 2002/358/EC and the Kyoto Protocol.
2. The total quantity of allowances to be allocated shall be consistent with assessments of actual and projected progress towards fulfilling the Member States' contributions to the Community's commitments made pursuant to Decision 93/389/EEC.
3. Quantities of allowances to be allocated shall be consistent with the potential, including the technological potential, of activities covered by this scheme to reduce emissions. Member States may base their distribution of allowances on average emissions of greenhouse gases by product in each activity and achievable progress in each activity.
4. The plan shall be consistent with other Community legislative and policy instruments. Account should be taken of unavoidable increases in emissions resulting from new legislative requirements.
5. The plan shall not discriminate between companies or sectors in such a way as to unduly favour certain undertakings or activities in accordance with the requirements of the Treaty, in particular Articles 87 and 88 thereof.
6. The plan shall contain information on the manner in which new entrants will be able to begin participating in the Community scheme in the Member State concerned.

7. The plan may accommodate early action and shall contain information on the manner in which early action is taken into account. Benchmarks derived from reference documents concerning the best available technologies may be employed by Member States in developing their National Allocation Plans, and these benchmarks can incorporate an element of accommodating early action.
8. The plan shall contain information on the manner in which clean technology, including energy efficient technologies, are taken into account.
9. The plan shall include provisions for comments to be expressed by the public, and contain information on the arrangements by which due account will be taken of these comments before a decision on the allocation of allowances is taken.
10. The plan shall contain a list of the installations covered by this Directive with the quantities of allowances intended to be allocated to each.
11. The plan may contain information on the manner in which the existence of competition from countries or entities outside the Union will be taken into account.

## **2. The structure of the National Allocation Plan**

The National Allocation Plan consists of

- a Macroplan which defines the national emissions budget and determines the total quantity of allowances to be allocated and
- a Microplan for the intended allocation of allowances to operators of individual installations; the Microplan also sets out the volume of emission allowances to be set aside for the new entrant reserve.

The *Macroplan* must be consistent with national climate protection targets and the climate protection programme. The overall budget of greenhouse gas (GG) emissions available to Germany in Kyoto period 2008–2012 is derived from the terms of the Kyoto Protocol and of the burden sharing agreement in the European Union. These state that in the period 2008–2012 GG emissions must be reduced by 21% compared to 1990 levels. The GG budget for the period 2005–2007 must be consistent with this target. The Macroplan substantiates these requirements in concrete form, breaking the GG budget down by greenhouse gas and sector.

The national GG emissions budget covers all six gases named in the Kyoto Protocol, whereas emissions trading in the first period 2005–2007 will be confined to CO<sub>2</sub>. The Macroplan therefore has to provide for likely changes in emissions of the other gases in response to agreed or planned measures. A budget for CO<sub>2</sub> emissions in 2005–2007 has been derived accordingly.

The installations covered by emissions trading account for by far the greater part of the energy and industrial sectors. Trading will not, however, (apart from a few exceptions) include emissions generated by private households, the transport sector or commercial activities (“Gewerbe”). To ensure overall compliance with the national CO<sub>2</sub> budget, the Allocation Plan also establishes a total budget for these sectors and describes the measures adopted to achieve these targets.

The Macroplan also stipulates what proportion of the total quantity of emission allowances will be allocated and what proportion will be set aside for the new entrant reserve.

The *Microplan* defines the methods, rules and criteria which determine allocation decisions and the question of what quantity of allowances will be granted to the various installations on the basis of the available data. The principles applied include grandfathering (allocation based on an installation’s historical emissions in a reference period) and benchmarking (allocation based on the average specific emissions of a product category). The data to which this methodology for calculating allowances for individual installations will apply in Germany derives from the period 2000–2002, following a government decision on 28 May 2003.

The Microplan is founded on the actual emissions from installations subject to emissions trading during the reference period 2000–2002. Quantities must be consistent with the Macroplan to ensure that the overall quantity of allowances actually allocated does not exceed or fall short of the quantity envisaged in the Macroplan.

The origin in both cases are the CO<sub>2</sub> emissions from installations subject to emissions trading during the reference period 2000–2002:

- The Macroplan indicates total CO<sub>2</sub> emissions from all installations subject to emissions trading in the reference period 2000–2002. To determine the budget, i.e. the total quantity of allowances which can now be either allocated or set aside for the new entrant reserve, this total is multiplied by the ratio between
  - the annual emissions budget set for the energy and industry sectors for the period 2005–2007
  - and**
  - emissions from the energy and industry sectors in the reference period 2000-2002.
- In the Microplan the allocation to an individual installation is calculated using
  - CO<sub>2</sub> emissions from the individual installations in the reference period 2000-2002
  - and**
  - the compliance factor.

- In determining the compliance factor, the following are taken into account:
  - the ratio between the CO<sub>2</sub> emissions budget for the energy and industry sectors in the period 2005-2007 and actual emissions in the reference period 2000-2002, and
  - allowances earmarked for the new entrant reserve and the sum total of all special allocations (e.g. early action).

(for this formula cf. Section C.6).

### **3. *Data collection, definition of installation and registry of installations***

Data was collected or estimated for every individual installation in order to determine allowances under the National Allocation Plan. Given the tight implementation deadlines in the Directive, it was not possible to base the *data collection* required for this purpose on a new legal framework. Instead, data had to be compiled on a voluntary basis with the help of the operators. In line with the government decision of 28 May 2003, the reference period is 2000–2002, and the data collection procedure was divided into two stages:

During the first stage, emission declarations (in accordance with Art. 27 of the Federal Immission Control Act - BImSchG) for 2000 were evaluated by the *Länder* (federal states). These declarations include details about handled substances relevant to emissions and about activity rates, from which the CO<sub>2</sub> emission quantities for 2000 can basically be calculated.

During the second stage, the *Länder* retrieved data directly from the operators. This survey embraced the entire period 2000–2002 and comprised all the details required for the application of the allocation rules. The Allocation Plan presented here has been based in large measure on the findings of this data collection survey.

For the decision on allowances to be final and legally binding (by 30 September 2004), data collection following the application procedure will comply with the new legal framework for implementing the Emissions Trading Directive, which by that time will have taken effect. Given the manner in which the data has been collected, therefore, the quantities derived from the Allocation Plan are provisional.

The definition of “installation” in Art. 3 of the Directive and the cumulative principle in Annex I (2) are interpreted in the same way as similar provisions in the Integrated Pollution Prevention and Control (IPPC) Directive and are transposed by means of the Federal Immission Control Act. When it comes to installation type, descriptions are based on the Act’s 4th implementing ordinance (4. BImSchV) – the Ordinance on Installations

Subject to Licensing – insofar as the type of installation concerned is listed in Annex I of the Directive.

Whether an Annex I installation is subject to emissions trading will depend, in the implementation strategy of the German government, on whether, under the terms of its permit, it falls within one of the categories in the list of relevant installations (Box 3).

Only some of the installations regulated by the above-mentioned Ordinance are subject to emissions trading. Installations covered by the Ordinance take part if they fall within the range of activities (sectors) to which the Emissions Trading Directive refers.

Given the regulatory system underlying the Ordinance, Classes I to V include installations with a rated thermal output of more than 20 MW which

- a) are permitted as installations under items 1.1, 1.2, 1.3, 1.4 or 1.5 of the Ordinance,
- b) would require specific licensing as subsets or auxiliary installations under items 1.1, 1.2, 1.3, 1.4 or 1.5 of the Ordinance, but have been permitted under Art. 1 (4) under a different item.

Firing systems in installations licensed under Art. 2 (2) of the Ordinance with a more specific key designation are included regardless of their rated thermal output if they are operated in installations which fall under Classes VI to XV.

By contrast, firing systems in installations whose purpose is not to generate or convert energy but, for example, to provide thermal support for a chemical or physical process (e.g. tube furnaces to split hydrocarbons in a chemical installation or drying plant for specific products) are only subject to emissions trading if they are operated in one of the sectors listed in the Annex.

Installations which fall within the scope of the Renewable Energy Sources Act in its version of 23 July 2002 are not subject to emissions trading.

CO<sub>2</sub> accounting must be maintained separately for all installations subject to emissions trading. In the case of refineries and integrated installations for the production of pig iron and steel (coke ovens, sintering units, blast furnaces, steel mills up to continuous casting), several installations can be treated together in the interest of appropriate monitoring with a view to obtaining more precise measurements of emissions, provided they are located on the same site and belong to the same operator (*“bubble”*).

#### **4. Public consultation**

Besides the macrodata and allocation rules, the National Allocation Plan contains a List of Installations participating in emissions trading along with their quantities of allowances intended to be allocated to this installations. Stakeholders were involved in drawing up the National Allocation Plan and this List of Installations from an early stage.

Renowned German research institutes provided scientific support for the establishment of the National Allocation Plan, in particular in devising rules for the allocation of allowances, and this process was accompanied by a broad dialogue with all sectors of society. In the run-up to the work on the Allocation Plan, two working groups were institutionalised: The *Arbeitsgemeinschaft Emissionshandel* (AGE), set up by the Ministry for the Environment, Nature Conservation and Nuclear Safety with representatives from all stakeholders, including environment groups, the business communities concerned, and federal and state parliaments; and a sub-group on emissions trading initiated by the Energy and Environment Task Force of the *Bund-Länder-Arbeitskreis* (BLAK), the primary aim of which is to promote exchange between federal authorities and the *Länder*.

A provisional List of Installations (without data on CO<sub>2</sub> emissions) was first published from 12 December to 31 December 2003. It was too early to include CO<sub>2</sub> data because the second stage of data collection had not yet been concluded. The main purpose of publication was to give the operators a timely opportunity to check whether their installations that were subject to emissions trading had been correctly designated in the Allocation Plan.

This publication was used as a basis in early 2004 for creating an updated list of installations subject to emissions trading. This list also indicates the installation-specific CO<sub>2</sub> emission data obtained on a voluntary basis for the reference period. In conjunction with the allocation rules laid down in the National Allocation Plan, this data provides the basis for calculating the expected quantity of allowances.

The enclosed List of Installations contains the following details:

- distinctive registration number
- activity or main activity
- name of installation with address of site and federal state
- name of installation operator
- expected quantity of allowances for 2005–2007 and annual issue for 2005, 2006 and 2007.

The list is broken down according to the main activities listed in Annex I of the Directive and indicates sub-totals for the provisional quantities of allowances and issues. It does not indicate special allocations, such as for early action or CHP, as terms and conditions had not yet been agreed at the time of the voluntary data collection survey.

*Box 3 Classes of installation subject to emissions trading*

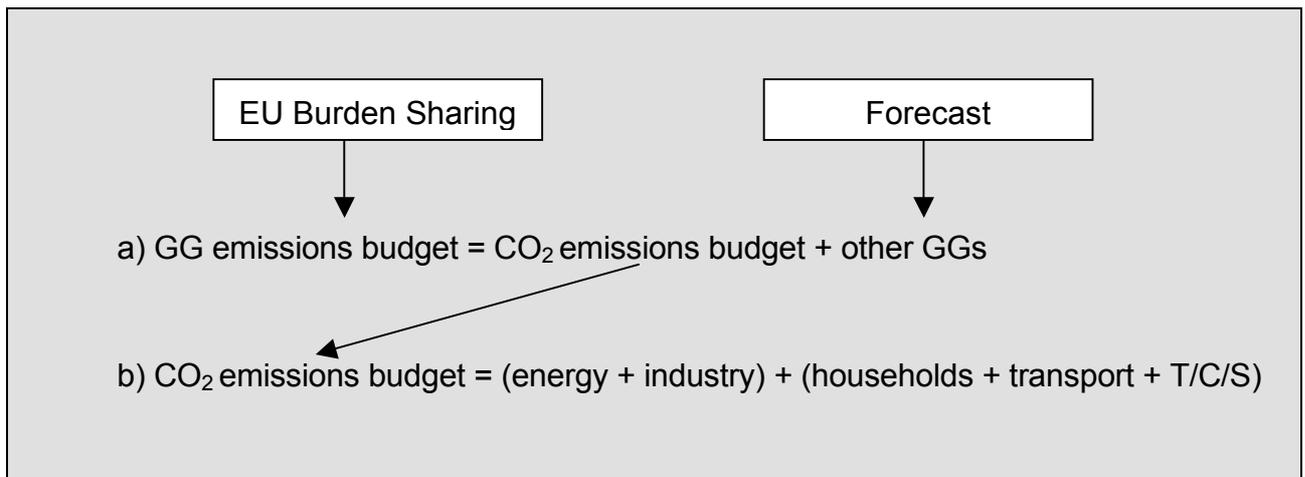
<b>ENERGY GENERATION AND CONVERSION</b>	
I	Installations for generating power, steam, hot water, process heat or hot waste gas using fuels in a combustion facility (e.g. power station, heat & power station, heat-only station, gas turbine station, combustion engine installation, other firing installation), including associated steam boiler, with a rated thermal input of 50 MW or more
II	Installations for generating power, steam, hot water, process heat or hot waste gas using coal, coke, including petroleum coke, coal briquettes, peat briquettes, peat fuel, untreated wood, emulsified natural bitumen, fuel oil, gaseous fuels (notably coke oven gas, mine gas, steel gas, refinery gas, synthesis gas, petroleum gas from tertiary extraction of petroleum, sewage gas, biogas), methanol, ethanol, untreated vegetable oils, vegetable oil methyl esters, untreated natural gas, liquefied gas, gases from public gas utilities or hydrogen with a rated thermal input of more than 20 MW and less than 50 MW in a combustion facility (e.g. power station, heat & power station, heat-only station, gas turbine station, combustion engine installation, other firing installation), including associated steam boiler, except for combustion engine facilities for drilling rigs and emergency power generators
III	Installations for generating power, steam, hot water, process heat or hot waste gas using solid or liquid fuels other than those listed under No. II in a combustion facility (e.g. power station, heat & power station, heat-only station, gas turbine station, combustion engine installation, other firing installation), including associated steam boiler, with a rated thermal input of more than 20 MW and less than 50 MW
IV	Combustion engine facilities to power working machinery using fuel oil EL, diesel fuel, methanol, ethanol, untreated vegetable oils, vegetable oil methyl esters or gaseous fuels (notably coke oven gas, mine gas, steel gas, refinery gas, synthesis gas, petroleum gas from tertiary extraction of petroleum, sewage gas, biogas, untreated natural gas, liquefied gas, gases from public gas utilities, hydrogen) with a rated thermal input of more than 20 MW, except for combustion engine installations for drilling rigs with a rated thermal input of more than 20 MW and less than 50 MW
V	Gas turbine facilities to power working machinery using fuel oil EL, diesel fuel, methanol, ethanol, untreated vegetable oils, vegetable oil methyl esters or gaseous fuels (notably coke oven gas, mine gas, steel gas, refinery gas, synthesis gas, petroleum gas from tertiary extraction of petroleum, sewage gas, biogas, untreated natural gas, liquefied gas, gases from public gas utilities, hydrogen) with a rated thermal input of more than 20 MW, except for closed-cycle installations with a rated thermal input of more than 20 MW and less than 50 MW
VI	Installations for the distillation or refinement or other downstream processing of petroleum or petroleum products in mineral oil or lubricant refineries
VII	Installations for the dry distillation of black coal or lignite (coke ovens)
<b>PRODUCTION AND PROCESSING OF FERROUS METALS</b>	
VIII	Installations for the roasting, smelting or sintering of iron ores
IX	Installations for the production or smelting of pig iron or steel including continuous casting, including with the use of concentrates or secondary raw materials, with a smelting capacity of 2.5 tonnes/hour or more, including operation in integrated smelting plants
<b>MINERAL INDUSTRY</b>	
X	Installations for the production of cement clinkers with an output of more than 500 tonnes/day in rotary kilns or more than 50 tonnes/day in other kilns
XI	Installations for the calcination of limestone or dolomite with an output of more than 50 tonnes/day quicklime or unslaked dolomite
XII	Installations for the production of glass, also from recycled glass, including installations for the production of glass fibre, with a melting output of more than 20 tonnes/day
XIII	Installations for the baking of ceramic products where kiln capacity is at least 4 m <sup>3</sup> and setting density per kiln at least 300 kg/m <sup>3</sup>
<b>OTHER INDUSTRIAL ACTIVITIES</b>	
XIV	Installations for the production of pulp from timber, straw or similar fibrous materials
XV	Installations for the production of paper and board with an output of more than 20 tonnes/day

## B. Macroplan

### 1. Introduction

The Macroplan as part of the National Allocation Plan establishes how the national emissions budget is shared between the various greenhouse gases and what proportion will be allocated to the emissions trading (ET) segment or to other sources. It determines the total quantity of allowances to be allocated to the emissions trading sectors.

*Box 4: Macroplan distribution of the national emissions budget*



The two parameters which serve as a starting point are greenhouse gas emissions in the reference year 1990<sup>3</sup> and the target pledged by the German government as part of the European burden sharing agreement for the period 2008–2012 (reduction of greenhouse gas emissions by 21% compared with the hybrid baseline year 1990/95). First, however, a Macroplan must be established for the allocation period 2005–2007. Drawing on Annex III of Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading in Europe, the emission budgets to be set for this period are determined in a manner which ensures that the total quantity of allowances allocated is consistent with the reduction pledge for 2008–12 and that overall progress towards achieving the 2008–2012 targets is guaranteed.

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<sup>3</sup> The baseline year set by the Kyoto Protocol is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions and 1995 for PFC, HFC and SF<sub>6</sub> emissions.

## **2. Trends in greenhouse gas emissions during 1990-2002**

By signing the United Nations Framework Convention on Climate Change (UNFCCC), Germany is inter alia obliged to report annually on changes in greenhouse gas emissions. The data below is based on the Greenhouse Gas Inventory for 1990–2001 submitted in June 2003.<sup>4</sup>

The Inventory showed that total greenhouse gas emissions in the baseline year were 1,218.2 Mt CO<sub>2</sub> equivalent. By 2001 they had fallen by almost 223 Mt CO<sub>2</sub> equivalent or 18.3%. The picture varies greatly from one greenhouse gas to another. CO<sub>2</sub> emissions showed the biggest decline in absolute terms: 144 Mt (-14.2%), or almost two-thirds of the total reduction in greenhouse gas emissions. CH<sub>4</sub> emissions followed, falling by 49 Mt CO<sub>2</sub> equivalent (-48.4%), contributing about a fifth to the reduction, while N<sub>2</sub>O emissions fell by 28 Mt CO<sub>2</sub> equivalent (-31.5%), contributing approximately 12%.

PFC and SF<sub>6</sub> emissions fell more in relative terms, but their role is insignificant by comparison. HFC emissions, which actually showed a strong increase in the course of the 1990s, are of secondary importance in the overall greenhouse gas accounts. CO<sub>2</sub> emissions represent by far the largest chunk of all greenhouse gas emissions: nearly 87%.

Under the EU Directive emissions trading will initially be confined to carbon dioxide emissions and specified installations. Table 1 shows how CO<sub>2</sub> emissions have developed in the years 1990 to 2002 in the different sectors.<sup>5</sup>

According to an average from the years 2000–2002, total CO<sub>2</sub> emissions had fallen by about 152 Mt or 14.9% since 1990. The biggest contributions were made by the energy sector (approx. 72 Mt) and by industry (just over 59 Mt). CO<sub>2</sub> emissions also declined in the trade, commerce and service sectors (30 Mt) and among private households (7 Mt), while emissions from transport were 16 Mt greater in 2002 than in 1990. There has, however, been a slight reduction in emissions in the transport sector every year since 1999.

Table 1 also provides some preliminary indications of the level of CO<sub>2</sub> emissions in the different sectors covered by emissions trading. Emissions subject to trading come predominantly from the energy sector itself and from the great majority of energy- and

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<sup>4</sup> Deutsches Treibhausgasinventar 1990–2001 in: Nationaler Inventarbericht 2003. Berichterstattung unter der Klimarahmenkonvention der Vereinten Nationen. Umweltbundesamt. Berlin, June 2003.

<sup>5</sup> The figures for CO<sub>2</sub> emissions between 2000 and 2002, unlike the results presented in the National Inventory Report for 2003, rely on the calculations by the Deutsches Institut für Wirtschaftsforschung (DIW Berlin) on the basis of more recent energy accounting data. Cf. Hans-Joachim Ziesing, Treibhausgas-Emissionen nehmen weltweit zu – Keine Umkehr in Sicht. In: Wochenbericht des DIW, no. 39/2003.

process-related industrial sources. Average annual CO<sub>2</sub> emissions from the combined energy and industrial sectors in 2000–2002 amounted to some 505 Mt. Compared with 1990, this is a decline of almost 131 million tonnes, which is just over one-fifth. As a result, the contribution of the two sectors to total CO<sub>2</sub> emissions fell from almost 63% in 1990 to 59% as an annual average for the years 2000–2002. By the same token, the relative contribution from all other sectors combined increased from a good 37% to 41%. In absolute terms, CO<sub>2</sub> emissions from these sectors fell by almost 21 Mt, or nearly 6%. This reduction was much smaller than in the energy and industrial sectors.

*Table 1 CO<sub>2</sub> emissions in Germany from 1990 to 2002 by sector*

Sectors	1990	1998	2000 <sup>1)</sup>	2001 <sup>1)</sup>	2002 <sup>1)</sup>	Average 2000/02	Change 1990 to 2000/02
	Mt CO <sub>2</sub>						%
<b>Energy production/conversion</b>	439.2	365.1	361.1	369.1	373.0	367.7	- 16.3
~ power stations	353.8	313.1	309.5	316.9	322.0	316.1	- 10.7
~ heat & power / district heating stations and other conversion activities	85.4	52.0	51.6	52.2	51.0	51.6	- 39.5
<b>Total industry</b>	196.9	142.9	142.1	137.0	133.5	137.5	- 30.2
~ industry (energy-related)	169.3	117.3	116.0	112.6	109.1	112.5	- 33.5
~ industrial processes <sup>4)</sup>	27.6	25.6	26.1	24.4	24.4	25.0	- 9.5
<b>Total energy plus industry</b>	636.1	508.0	503.2	506.1	506.5	505.2	- 20.6
<b>Trade/commerce/services<sup>3)</sup></b>	90.5	66.4	59.2	63.0	59.0	60.4	- 33.3
<b>Transport</b>	158.8	175.7	178.4	174.6	172.6	175.2	+ 10.3
<b>Households</b>	129.0	131.3	116.0	129.9	119.9	121.9	- 5.5
<b>Total other sectors</b>	378.4	373.4	353.6	367.5	351.5	357.5	- 5.5
<b>Total emissions<sup>2)</sup></b>	1014.4	881.4	856.8	873.5	858.0	862.8	-14.9
1) Provisional 2) excl. international air traffic 3) incl. military service units 4) 2002 estimated Source: Umweltbundesamt, AG Energiebilanzen, Calculation by DIW Berlin							

### **3. The Macroplan at national level**

#### **3.1 Preliminary remarks**

Emissions budgets for the national Macroplan for the period 2005–2007 are calculated below. For the energy and industrial sectors the underlying annual CO<sub>2</sub> emissions are approx. 505 Mt in the reference period 2000–2002. CO<sub>2</sub> emissions in these sectors were 508 Mt in 1998.

#### **3.2 The period 2008–2012**

Under the European burden sharing agreement, Germany has pledged to reduce emissions of the six greenhouse gases by the period 2008–2012 by 21% compared with the hybrid baseline year 1990/1995.<sup>6</sup> The National Inventory Report for 2003 gives greenhouse gas emissions for the baseline year as 1,218.2 Mt CO<sub>2</sub> equivalent. Averaged over the commitment period 2008–2012, this results in an annual emissions budget of 962 Mt CO<sub>2</sub> equivalent.

**Emissions budget for the six greenhouse gases in the period 2008–2012:  
962 Mt CO<sub>2</sub> equivalent per year**

During the initial stage, the EU Emissions Trading Directive is confined to CO<sub>2</sub> emissions. The German government estimates that total annual emissions of the other five greenhouse gases in the period 2008–2012 will fall to about 116 Mt CO<sub>2</sub> equivalent. This leaves a national CO<sub>2</sub> emissions budget during 2008–2012 of 846 Mt CO<sub>2</sub> per year.

**Emissions budget for CO<sub>2</sub> in the period 2008–2012:  
846 Mt CO<sub>2</sub> per year**

Compared with the annual average for 2000–2002, this requires an additional reduction of about 17 Mt or 2%.

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<sup>6</sup> The baseline year set by the Kyoto Protocol is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions and 1995 for PFC, HFC and SF<sub>6</sub> emissions.

### 3.3 The period 2005–2007

The National Allocation Plan presented here refers initially to the period 2005–2007. As explained above, the emissions budget for this period, based on Annex III of the EU Emissions Trading Directive and designed to avoid excessive emission reduction demands in following years, is set at 982 Mt CO<sub>2</sub> equivalent per year.

**Emissions budget for the six greenhouse gases in the period 2005–2007:  
982 Mt CO<sub>2</sub> equivalent per year**

For non-CO<sub>2</sub> emissions the prognosis for this period is 123 Mt CO<sub>2</sub> equivalent, which results in an emissions budget for CO<sub>2</sub> of 859 Mt per year.

**Emissions budget for CO<sub>2</sub> in the period 2005–2007:  
859 Mt CO<sub>2</sub> per year**

### 3.4 Overview

Table 2 sums up the national emissions budgets described above for the periods 2005–2007 and 2008–2012.

*Table 2: Greenhouse gas emissions (excl. sinks) in Germany 2005–2007 and 2008–2012: The Macroplan at national level*

Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF	Total non-CO <sub>2</sub>	Total	
	In Mt CO <sub>2</sub> equivalent								
Base year	1014.4	101.1	87.9	6.4	1.8	6.6	203.7	1218.2	
1990	1014.4	101.1	87.9	3.5	2.7	3.9	199.1	1213.5	
1995	898.8	69.8	78.6	6.4	1.8	6.6	163.1	1061.8	
1998	881.4	60.9	62.3	7.0	1.5	6.0	137.7	1019.1	
1999	854.7	59.3	59.0	7.3	1.2	4.4	131.1	986.0	
2000 (prov.)	856.8	54.5	59.4	6.6	0.8	4.0	125.3	982.1	
2001 (prov.)	873.5	52.2	60.2	8.1	0.7	3.3	124.6	998.1	
2002 (prov.)	858.0	no data yet							
Average 2000/02 (non-CO <sub>2</sub> : 1999-2001)	863	55	60	7	1	4	127	990	
Target 2005–2007	859						123	982	
Target 2008–2012	846						116	962	

Source: Umweltbundesamt, Nationales Emissionsinventar 2003; CO<sub>2</sub> emissions for 2000 2002 are based on calculations by DIW Berlin; Forecast for "Not additional measures" Policy Scenarios III)

## **4. The Macroplan by sector**

### **4.1 Preliminary remarks**

The emissions budget defined above is distributed to the macrosectors in line with the sectoral breakdown used in energy accounting (energy conversion, industry; trade/commerce/services, households, transport). Non-energy-related CO<sub>2</sub> emissions (industrial processes) also are taken into account. At macrolevel, the CO<sub>2</sub> emissions budget of 859 Mt during the period 2005–2007 and of 846 Mt during the period 2008–2012 must be distributed between these sectors.

### **4.2 The emissions budget for the energy & industry sector**

From the German government's perspective, the emissions budget for the energy and industry sectors for the period 2005–2007 is an subordinate target on the road to implementing the agreements on climate protection. Annex III (1) of the Directive requires that this must be consistent with a strategy to achieve or over-achieve the national Kyoto target in line with the EU burden sharing agreement. Against this background the annual average emissions budget for energy and industry has been set at 503 Mt CO<sub>2</sub>.

One national energy policy measure which must be taken into account in line with Annex III (1) of the Directive is Germany's commitment to nuclear power phase out. An orderly withdrawal from the use of nuclear power has been formulated in the agreement reached between the government and the energy utilities on 14 June 2000 and in the amendment to the Atomic Energy Act, which took effect on 27 April 2002.

For the period 2005–2007 the closure of the nuclear power stations at Stade and Obrigheim is to be compensated by an annual total of 1.5 Mt CO<sub>2</sub>. This compensation is a transition rule confined to the first trading period. From the period 2008–2012 onwards, investments to substitute decommissioned nuclear power plants will result in allowances being allocated from the new entrant reserve.

### **4.3 Sectoral emissions budgets in the periods 2005–2007 and 2008–2012**

The CO<sub>2</sub> emissions budgets for the energy and industry sectors during the periods 2005–2007 and 2008–2012 have been determined by defining the budgets for total greenhouse gas emissions and for CO<sub>2</sub> emissions, also bearing in mind the voluntary commitments undertaken by the German business community to reduce CO<sub>2</sub> emissions and the agreement on phasing out nuclear power. This automatically also defines the emissions budgets over those two periods for the totality of the remaining sectors.

- For the *period 2005–2007*, an emissions budget of 503 Mt CO<sub>2</sub> per year, corresponding to 356 Mt CO<sub>2</sub> per year for the other sectors (trade/commerce/services, transport and households);

**CO<sub>2</sub>-emissions budget in the period 2005–2007:**

**Energy and industry: 503 Mt CO<sub>2</sub> per year**

**Other sectors: 356 Mt CO<sub>2</sub> per year**

- For the *period 2008–2012*, a provisional emissions budget of 495 Mt CO<sub>2</sub> per year (to be reviewed in 2006), corresponding to an emissions budget for the other sectors of 351 Mt per year.

**CO<sub>2</sub>-emissions budget in the period 2008-2012:**

**Energy and industry: 495 Mt CO<sub>2</sub> per year**

**Other sectors: 351 Mt CO<sub>2</sub> per year**

The requirement for the new entrant reserve and the budgets for special allocations will be covered from the macrobudgets for the energy and industry sectors (cf. Section C). In distributing the emissions budget among the sectors not covered by emissions trading, the German government is guided by the need to contain the rise in transport-related greenhouse gas emissions with the aid of appropriate measures and to initiate a moderate decline in the trade/commerce/service sectors and a slightly greater decline among private households. Although household emissions have increased since the reference period, there is a noticeable reduction temperature-adjusted figures are compared. Table 3 sums up the data.

Table 3 CO<sub>2</sub> emissions 1990–2002 and emissions budgets 2005–2007 and 2008–2012

	Energy sector (E)	Industry (I) <sup>1)</sup>	Emissions-budget E+I	T/C/S	Transport	Households	Total other sectors	Total
				Other sectors				
in Mt CO <sub>2</sub> per year								
Base year 1990/95	439	197	<b>636</b>	90	159	129	378	1014
1998	365	143	<b>508</b>	66	176	131	373	881
1999	351	141	<b>492</b>	62	181	120	363	855
2000 (prov.)	361	142	<b>503</b>	59	179	116	354	857
2001 (prov.)	369	137	<b>506</b>	63	175	130	368	874
2002 (prov.)	373	133	<b>506</b>	59	173	120	352	858
<b>Average 2000/02</b>	<b>368</b>	<b>137</b>	<b>505</b>	61	175	122	<b>358</b>	<b>863</b>
<b>Target 2005–2007</b>	No further differentiation		<b>503</b>				<b>356</b>	<b>859</b>
<b>Target 2008–2012</b>	No further differentiation		<b>495</b>				<b>351</b>	<b>846</b>

1) incl. industrial processes

Source: Umweltbundesamt, Nationales Emissionsinventar 2003; CO<sub>2</sub> emissions for 2000 to 2002 are based on calculations by DIW Berlin; Forecast for "No additional measures" (Policy Scenario III)

#### **4.4 The emissions budget for installations subject to emissions trading in the period 2005–2007**

Although the great majority of installations participating in emissions trading fall within the energy and industry sectors, they are not completely identical with these sectors. According to the findings of the data collection survey, the installation-specific annual average over the period 2000–2002 indicates actual CO<sub>2</sub> emissions of 501 Mt. per year for the installations participating in emissions trading.

These emissions are then multiplied by the ratio calculated for the energy and industry sector between the annual emissions budget for the period 2005–2007 (503 Mt CO<sub>2</sub>) and average annual emission levels during the reference period 2000–2002 (505 Mt CO<sub>2</sub>), resulting in a CO<sub>2</sub> emissions budget of 499 Mt for the installations participating in emissions trading.

<p style="text-align: center;"><b>CO<sub>2</sub> emissions budget for installations participating in emissions trading in the period 2005–2007: 499 Mt CO<sub>2</sub> per year</b></p>
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## **5. *Policies and measures for sectors not subject to emissions trading***

### **5.1 Transport sector measures**

The research project “Policy Scenarios for Climate Protection III” has provided many useful indications of the impact of existing and potential measures. As a result of the climate protection measures adopted or implemented by the German government since 1998, which have been taken into account in the reference trends, transport-related direct CO<sub>2</sub> emissions will fall by an additional total of approx. 13 Mt per year in the 2008–2012 timeframe (compared with the business-as-usual scenario).

The most effective measures to date have been:

- ecological tax reform
- the promotion of renewable energy sources for fuels
- the motorway charge for HGVs
- the promotion of non-sulphurous fuels
- a campaign to encourage a climate-conscious attitudes in transport.

### **5.2 Household sector measures**

The outstanding factor in CO<sub>2</sub> emissions from private households is heating. Here again, the research project “Policy Scenarios for Climate Protection III” provided useful information to be used for impact assessment.

As a result of climate protection measures implemented by the German government since 1998, which have been taken into account in the reference trends, direct CO<sub>2</sub> emissions generated by space heating will fall by approx. 12 Mt per year in the 2008–2012 timeframe (compared with the business-as-usual scenario).

The most effective contributing measures to date (volumes until 2010) have been:

- the CO<sub>2</sub> reduction programme financed by the KfW
- the CO<sub>2</sub> building redevelopment programme financed by the KfW
- the housing modernisation programme financed by the KfW
- other measures and funding programmes.

## C. Microplan

### 1. Introduction

The Microplan sets out the rules for the allocation of allowances to individual installations and for the new entrant reserve.

Allowances allocated to existing and new installations will be free of charge in the periods 2005–2007 and 2008–2012.

For installations commissioned before 31 December 2002, the allowance allocated will be based on a survey of **historical emissions** data (Section C.3.1). The procedure for the allocation and issue of allowances is described in detail in Sections C.3.1.1 and C.3.1.2.

For installations commissioned between 1 January 2003 and 31 December 2004, the allowance will be allocated on the basis of **announced emissions**. The same applies to installations which fall under Annex I of the EU Emissions Trading Directive due to expansion of capacity during this period and which therefore qualify for emissions trading (Section C.3.1.3).

Allowances from installations which have been decommissioned can be transferred for four years to installations or extensions to installations commissioned from 1 January 2005 (**Transfer rule** – Section C.3.3). Special rules under this transfer rule apply for up to two years when existing and new installations are operated in parallel.

If installations or extensions to installations commissioned from 1 January 2005 are **not** eligible to receive a transfer, an allowance will be allocated free of charge in accordance with Section C.3.5 (**New entrant rule**). Section C.3.5.2 describes how the **new entrant reserve** required for this purpose will be constituted.

**Closure rules** will apply to decommissioned installations whose allowances are **not** to be transferred to new installations. Where the annual emissions of an installation decrease substantially compared with the reference period, the allowances issued will be modified in line with the **capacity utilisation adjustment rules** (Section C.3.2)

There are a number of circumstances in which operators can apply for *Special rules* on allowances. These relate to **early action** (Section C.4.1), **process-related emissions** (Section C.4.2) and installations for **combined heat & power generation** (Section C.4.3).

For condensing power stations generating particularly high emissions due to their age and the technology in use, the allowance will be subject to an additional reduction factor.

The application of this **deduction rule for old plant** is described in Section C.3.4.

Section C.4.4 addresses the issue of **increased emissions due to (EU) legal requirements**.

The rule for transferring allowances issued for the period 2005–2007 to the period 2008–2012 (**banking**) is set out in Section C.5.

## **2. Data collection and statistical framework at installation level**

The second stage of data collection to elaborate a Microplan for the National Allocation Plan was concluded on 31 December 2003. This shows about

**2,400 installations**

which come under the scope of the Greenhouse Gas Emissions Trading Act (TEHG) and a total emissions volume, based on installation-specific averages, of

**501 Mt CO<sub>2</sub> per year**

(annual average for 2000–2002).

### **Data collection methods**

The data was collected in Germany in two stages. During the first stage, the competent authority in each *Land* evaluated the operators' emission statements for 2000. Under the Emissions Statement Ordinance, the 11th ordinance implementing the Federal Immission Control Act (11. BImSchV), almost all the installations subject to emissions trading are obliged to submit these annual returns, which include data relevant to the calculation of CO<sub>2</sub> emissions. The aim was to obtain a preliminary overview of the installations, operators and available data. Drawing on the insights derived from this first stage, a data model was created and a databank (software) developed for stage two. The next move was to offer the findings for public comment.

### **Definition of the term “installations”**

The definition of installations subject to emissions trading was based on the Ordinance on Installations Subject to permitting (4. BImSchV), which implements the Federal Immission Control Act, taking into account the limit values set by the EU Emissions Trading Directive.

### **Identification of installations and cumulative approach**

From the entire contingent of installations obliged to submit an emissions statement in 2000 under the 11th Ordinance, the *Länder* then identified all installations which are covered by the definition of installations in the EU Emissions Trading Directive. They also identified installations producing pulp, paper and cardboard which were not required to return emissions statements but were nevertheless subject to emissions trading, as well as installations commissioned after 1 January 2001 which had not yet submitted a statement.

The cumulative definition of installations is based on the licensing of *jointly used operational facilities* under Art. 1 (3) of the 4<sup>th</sup> Ordinance.

### **Stage 1**

As the emissions statements for 2000 did not contain all the details relevant to CO<sub>2</sub> emissions, the state authorities examined the available data to identify gaps and establish plausibility. The data from the first survey were reviewed again at federal level to obtain an initial basis for the NAP Microplan.

### **Stage 2**

The second round of data collection (operator survey) took as its basis those installations identified by the *Länder* as subject to emissions trading. Therefore the authorities supplied operators with purpose-designed software (RISA-GEN) and the operator-specific data compiled during the first stage.

### **Description of software**

The data model for this software breaks down into four hierarchical tiers:

- operator
- operational entity
- installation
- component(s) of an installation

The operator tier is used to describe the operator of the installation in clear, transparent terms. The operational entity is defined as one or more installations run by the operator on a particular site. The third tier is the licensed installation, identified by its IPPC number and item as listed in Annex I of the 34<sup>th</sup> Ordinance Implementing the Federal Immission Control Act. The fourth tier (component) provides detailed data on substances used which are of relevance to emissions.

Data for all installation components is aggregated on the installation tier. In exceptional cases (“bubble”, see below) it is aggregated for all installations at the level of the operational entity, as allowances are normally calculated on the basis of installations, and, in exceptional cases, of operational entities.

This data model also permits the incorporation of early action data.

### **Special treatment for selected activities**

To ensure the accuracy of data on CO<sub>2</sub> emissions, it made sense to permit joint accounting for several installations in the case of refineries and integrated pig iron and steel production facilities (“bubble”). This is only permitted when all the installations belong to the same operational entity. i.e. they must be located on the same site under the responsibility of the same operator. Power stations within operational entities engaged in these two above-mentioned industries are not, for example, regarded as “bubbles” and are assessed individually.

For all installations that do **not** meet these two conditions, inputs and outputs are booked independently.

### **CO<sub>2</sub> emission and conversion factors**

Operators were given the choice between two approaches to emission and conversion factors:

- the application of standard emission factors and standard conversion factors from a national list of substances, or
- the application of separate specific factors for newly defined substances, the determination of which (measurements and calculations) must be substantiated in detail and (in future) certified.

Using the standardised national list meant that emissions were determined without incurring additional costs for establishing emission and conversion factors. Use of the list was recommended, with the added advantage that CO<sub>2</sub> emissions were determined on a common basis.

### **Standard list of substances**

Germany maintains a standardised list with a large number of fuels, raw materials and products for which emission factors have been pre-defined for general nationwide application following detailed research and wide consultation with industry.

The conversion factor (or oxidation factor for fuels) was set at 1 (one) for all substances defined on a homogeneous national basis. For the purpose of input-output analyses CO<sub>2</sub> emission factors can also be interpreted as CO<sub>2</sub> absorption factors.

To attribute the right CO<sub>2</sub> emission factor to the fuel data, it is important to distinguish fuel type and place of origin, which must be substantiated with appropriate documentation (bills of delivery, etc.). In cases where *evidence is supplied* that

distinguishing the fuel type is impossible or would require unacceptable effort, so-called fallback values (hardship clause) have been set for lignite, coal, natural gas, other gases and waste in order to avoid unreasonable documentation costs.

For these fallback values, the standardised list uses the lowest CO<sub>2</sub> emission factor for each class of substances.

All CO<sub>2</sub> emission factors refer to emissions of carbon which is *not* of biogenic origin. In line with the Monitoring Guidelines for EU emissions trading, “biogenic” describes organic material that a) is not of fossil origin and b) is biologically degradable.

The standard list of CO<sub>2</sub> emission factors is available in German and in updated form on the Internet at [www.nap-bmu.de](http://www.nap-bmu.de).

### **New substances**

Designations of newly defined substances were to be guided by the designations used in the German list and, in the case of fuels, were to specify type and origin or geographic source of supply. When substantiating CO<sub>2</sub> emission factors for newly defined substances,

- observed carbon content in the case of solid and liquid fuels and observed carbon content and composition of gases in the case of gaseous substances, and
- in the case of fuels, additionally the (lowest) calorific value established

had to be documented in appropriate detail and substantiated by evidence. Any biogenic carbon was to be deducted from total carbon content. It was *not* admissible to calculate carbon content for newly defined substances by means of (statistical) estimators.

In the case of newly defined fuels or raw materials with a biogenic component (evaluated with an emission factor of 0 t CO<sub>2</sub>/TJ or 0 t CO<sub>2</sub>/t raw material), the biogenic component was to be established and substantiated separately. The determination of carbon content and (where appropriate) the (lowest) calorific values of newly defined fuels had to comply with the following German standards: DIN 51721, DIN 51729, DIN 51900 or DIN 51857. Where any other (international, corporate or sectoral) standards were chosen to determine carbon content, composition of gases or (lowest) calorific value, these were to be named and their suitability or equal merit for the purposes of determining emission factors was to be substantiated in a suitable manner.

Standards of this kind were not yet available for establishing biogenic carbon content in special fuels. It was admissible, however, to draw on procedures such as certification under RAL-GZ-724 (for derived fuels).

CO<sub>2</sub> emission factors for process-related CO<sub>2</sub> emissions resulting from the chemical conversion of newly defined fuels were to be derived transparently from suitable stoichiometrical or other analyses and documented. The potentially incomplete conversion of

each raw material into process-related CO<sub>2</sub> was to be taken into account by means of an appropriate conversion factor for that particular raw material.

In each case, a conversion factor was also to be indicated for newly defined fuels, raw materials or products. Wherever a value of 1 was applied, no evidence was required.

For both energy-related and process-related CO<sub>2</sub> emissions, conversion factors not equal to 1, specific to the installation, fuel or raw material, were accepted for newly defined substances, provided that the applicant established the amount of carbon not identified as a CO<sub>2</sub> emission (expressed as CO<sub>2</sub> equivalent), described its whereabouts and substantiated (or certified) this by means of relevant measurements or other procedures.

### **Calculating CO<sub>2</sub> emissions**

When determining data for the National Allocation Plan, only CO<sub>2</sub> emissions were included. A distinction had to be drawn between:

- energy-related CO<sub>2</sub> emissions: CO<sub>2</sub> emissions from the combustion (oxidation) of fossil fuels,
- process-related CO<sub>2</sub> emissions: CO<sub>2</sub> emissions from other (chemical) processes.

Various methods were used during the data collection survey to establish emissions:

- calculation of energy-related CO<sub>2</sub> emissions based in fuel input,
- calculation of process-related CO<sub>2</sub> emissions based on raw material input,
- calculation of process-related CO<sub>2</sub> emissions based on productive output,
- determination of CO<sub>2</sub> emissions by means of direct measurements.

Calculations of CO<sub>2</sub> emissions by means of these various methods were based on the relationship between the following factors:

- activity rate,
- calorific emission factor or
- mass/volume emission factor, and
- conversion factor (in the case of combustion: oxidation factor).

To calculate CO<sub>2</sub> emissions using these various methods, it was essential to obtain precise data on the activity rate of the installation in question, i.e. to quantify inputs of different fuels and raw materials as well as production outputs.

Combinations of different calculation methods were acceptable.

## Projections

Data on substances of relevance and the concomitant activity rates were required for the years 2000, 2001 and 2002 for the “component” tier of the data hierarchy. In the case of components commissioned after 1 January 2000, and therefore not in operation all year round, operators were asked to add a projection on emissions for the missing part of the year. In extrapolating the emission data, they were called upon to apply characteristic installation factors and to reflect the influence of the economic cycle and of weather conditions during the period.

For installations commissioned in 2003, operators were asked to supply the details for that year as required by the data model, on the basis of a projection or a verifiable estimate.

## Estimate

Two different methods were identified for estimates:

1. an estimate of emission volume based on reference installations,
2. an estimate of emission volume based on the data for “installed capacity/production capacity” and “type of fuel handled”. CO<sub>2</sub> emissions were calculated by, for example, adopting mean values typical of the sector to describe the utilisation of installation capacity and CO<sub>2</sub> emission factors.

In each case the data used was that provided in the operator survey.

## Data verification

The data was evaluated in order to determine a plausible, verifiable basis for elaborating a Microplan as part of the National Allocation Plan. An absolute quantity of CO<sub>2</sub> emissions for the years 2000, 2001 and 2002 (where data was available for those years) had to be established for every installation subject to emissions trading. Energy- and process-related emissions were listed separately wherever possible.

The next major step is to assess and record the quality of the data. This was done with the aid of plausibility tests. Given the large number of installations in Germany, this was only feasible on the basis of generalised and automatable criteria (empty boxes, obviously wrong entries, emission-specific or sector-specific technological coefficients).

Essentially, importance was attached to the following points:

- **Completeness:** full identification of all installations subject to emissions trading;
- **Consistency:** no contradiction between data pertaining to the same installation (e.g. capacity rate and mass flows) or between the cumulated reported data and the macroeconomic data available to the *Land*;

- **Transparency:** substantiation of all figures given and proof of their correctness. This is especially important when individual values are applied instead of predefined calorific values and emission factors.

## **List of installations for allocation**

The list of installations participating in emissions trading, along with CO<sub>2</sub> emissions for the reference period 2000–2002, is included in Annex H.

### **3. General Allocation rules**

#### **3.1. Existing installations**

##### *3.1.1 Principles*

First-time allocations of allowances for the periods 2005–2007 and 2008–2012 are free of charge.

For installations commissioned prior to 31 December 2002, the allocation is based on historical CO<sub>2</sub> emissions in a reference period. The quantity of the allowance is determined by multiplying the historical emissions data by a standardised compliance factor.

For installations commissioned between 1 January 2003 and 31 December 2004, the allocation is based on announced CO<sub>2</sub> emission data. Allowances based on reported data are subject to *ex-post* adjustment.

Allowances for all existing installations will be issued in accordance with a standard procedure.

Special rules can be applied under a number of specific conditions (cf. Section C.4).

##### *3.1.2 Allocation free of charge on the basis of historical emissions in the reference period (grandfathering)*

The standard method for allocating allowances to existing installations is by granting an allocation free of charge on the basis of historical emissions (grandfathering). In certain cases special allowances or rules may apply. These are described in detail in Section C.4.

The emission allowance issued to an installation is derived by multiplying its historical annualised CO<sub>2</sub> emissions during the reference period by a standardised compliance

factor (cf. Section G, List of formulae).<sup>7</sup>

The baseline for all installations commissioned prior to 31 December 1999 is the period from 1 January 2000 to 31 December 2002.

For installations and extensions to installations commissioned between 1 January 2000 and 31 December 2000, the baseline is the period from 1 January 2001 to 31 December 2003.

For installations and extensions to installations commissioned between 1 January 2001 and 31 December 2001, the baseline is the period from 1 January 2002 to 31 December 2003, combined with a projection which extrapolates emission data for the rump year 2001 and generates a figure for the full year taking account of factors typical for the installation.

For installations and extensions to installations commissioned between 1 January 2002 and 31 December 2002, the baseline is the period from 1 January 2003 to 31 December 2003, combined with a projection which extrapolates emission data for the rump year 2002 and generates a figure for the full year taking account of factors typical for the installation.

For installations and extensions to installations commissioned from 1 January 2003 to 31 December 2004, the emission allowance is determined on the basis of announced data and subject to *ex-post* adjustment.

Under the grandfathering approach, allowances for all existing installations are allocated according to the same procedure. This complies with Criterion 5 of Annex III of the Directive. However, all other factors being equal, grandfathering grants higher allowances to inefficient installations with regard to CO<sub>2</sub> emissions than to those which conform to efficient contemporary standards as a result of active climate protection measures. To counter this problem, the National Allocation Plan permits *early action* to be credited in the form of a special allowance (cf. Section C.4.1).

In this respect, allocation based on benchmarking offers a number of advantages. However, the benchmarking method makes stringent demands on data and calls for extensive preparatory work in order to create product groups and determine the right benchmarks. This is not feasible for the first Allocation Plan 2005–2007.

When drawing up its second National Allocation Plan, the German government will review whether and how the basis for allocation can be updated.

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<sup>7</sup> It is advisable to apply a multiple-year baseline to mitigate installation-specific fluctuations in emissions due to factors such as sector business cycles, maintenance and inspections or other special factors. For the different approach to process-related emissions, cf. Section C.4.2.

### 3.1.3 Allocation free of charge on the basis of announced emissions

The allocation of allowances for installations or extensions to installations commissioned between 1 January 2003 and 31 December 2004 is based on announced annualised CO<sub>2</sub> emissions for these installations. A compliance factor of 1 is granted to these installations for 12 years (cf. Section G, List of formulae).

When submitting an application for allocation to the German Emissions Trading Authority (Deutsche Emissionshandelsstelle - DEHSt), the operator must enclose an expert report on the characteristic features of the installation in question which are of relevance to the allocation. This report must specify installation capacity, the projected use of relevant fuels and raw materials, the projected capacity utilisation and the CO<sub>2</sub> emissions which can be derived from this. For condensing power plant fired by coal or lignite, details are in addition required on the age of the installation (year of initial commissioning) and on its net degree of effectiveness. The application procedure entails verification that the data is consistent with rules for drawing up installation-specific CO<sub>2</sub> emission reports. The DEHSt examines the operator's data and may correct excessively high figures.

If, once the installation is in operation, its activity turns out to be more or less than the level assumed when calculating the quantity of allowances, an adjustment will be carried out *ex post*. When allowances are issued for the following year, any surplus allowance will be subtracted from the figure. If activity was higher than the value used to calculate the quantity of allowances, an additional allowance will be added when allowances are issued the following year. These additional allowances will be drawn from the new entrant reserve. The original allocation decision will be amended accordingly.

To enable the DEHSt to determine the volume of *ex-post* adjustments before issuing the next round of allowances (by 28 February each year), the operators of new installations must inform the DEHSt by 31 January of the following year what their actual average activity rate has been.

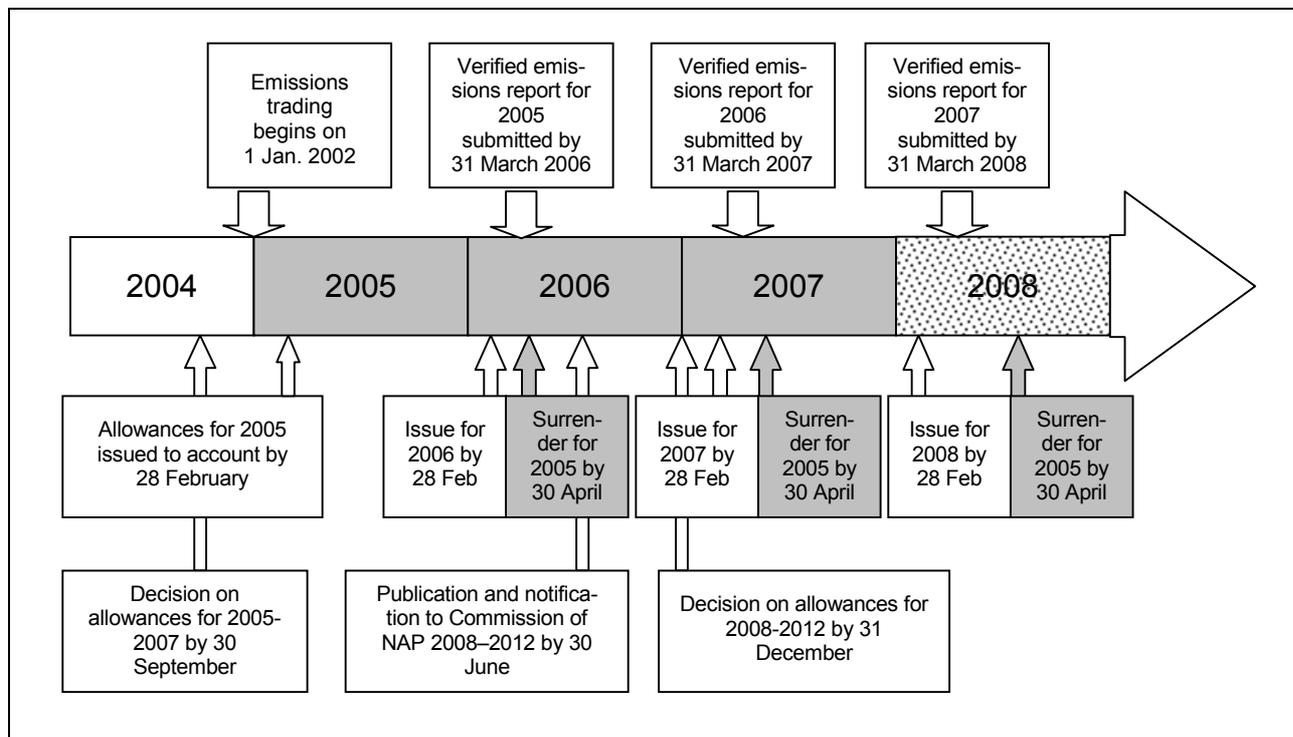
As an alternative option, the operators of installations commissioned between 1 January 2003 and 31 December 2004 can transfer allowances from installations decommissioned after 31 December 2002 which would otherwise have qualified for a fresh allocation. The other rules for transfers of allowances apply as described in Section C.3.3.

### 3.1.4 Annual issue of allowances

As a rule allowances for the period 2005–2007 will be issued by 28 February of each calendar year in equal tranches, i.e. one-third of the overall allocation each year. Because there is a time lag between the issue and surrender of allowances (see Figure

1), allowances from the following year can be drawn on to surrender allowances with regard to the previous year's emissions (intra-period borrowing). The previous year's allowances can also be used for emissions in the following years of the same allocation period (intra-period banking). In terms of business flexibility, therefore, proportional issuing is hardly different from any other issuing procedure (e.g. degressive distribution).

Figure 1 Issue and surrender of allowances for the period 2005–2007



### 3.2 Termination of operations or reduced utilisation of capacity

The allowances granted to the operator of an installation for a particular allocation period are set out in the National Allocation Plan. However, these allowances are issued annually in equal proportions (Annual certification, cf. Section C.3.1.4), rather than once for the entire period. If the operation of an installation is terminated, no allowances will be issued the following year, unless the allowances are to be transferred (cf. Section C.3.3).<sup>8</sup> The allocation decision will be amended accordingly.

Operators of installations with an authorisation to emit greenhouse gases must inform the DEHSt directly when terminating operation of their installation.

<sup>8</sup> Further issues might be seen as a “closure bonus”. Moreover, they would unnecessarily restrict the quantity of allowances available for use by other installations.

The DEHSt must consider operation to have terminated de facto in any given year once the installation emits less than 10% of its average annual baseline emissions. If the allocation of allowances was based on reported CO<sub>2</sub> emission data, the value for comparison shall be the average annual CO<sub>2</sub> emissions as appropriate. In the event of a de-facto termination of operation, no allowances will be issued as well in the following year unless the operator can prove that operation only ceased temporarily due to protracted maintenance or failure-induced repairs.

If, following the submission of the emissions report after 31 March of each year, the DEHSt observes a de-facto termination of operation during the previous year (cf. Art. 17 TEHG) and the operator has not demonstrated that the termination was only of temporary nature, the DEHSt will demand the surrender of allowances issued for the current year. If the operator no longer holds these allowances, he must purchase the quantity required in the market. If he does not comply with this duty within an appropriate time, he must pay a penalty of 40 € / t CO<sub>2</sub> in the first trading period (2005–2007) and 100 € / t CO<sub>2</sub> in the second trading period (2008–2012). This payment does not exonerate the operator from surrendering the requisite quantity of allowances. The allocation decision will be amended accordingly.

If an installation does not cease operations, but the utilisation of productive capacity (activity rate) and the respective emissions are substantially reduced, the quantity of allowances issued will be adjusted ex post.

If the annual emissions of an installation are lower than 60% of its average annual emissions during the reference period, the quantity of the allowance issued for that year will be reduced by the same proportion as the reduction in utilisation of capacity compared to the reference period. In subsequent years the allowances issued will be those stated in the original allocation decision, although the DEHSt retains its right to apply the rule on reduced utilisation again as necessary and to adjust the figure *ex post*.

Drawing on the emission data supplied by the operator, the DEHSt will examine whether any adjustment needs to be made in response to a lower volume of emissions. In this event the operator must surrender any surplus allowances to the DEHSt.

Any allowances recalled or not issued due to application of the closure rule or the adjustment rule for reduced utilisation will be placed in the new entrant reserve.

### **3.3 Transfer of allowances to new installations**

The closure rule need not be applied if the operator of the decommissioned installation or his legal successor commissions a new installation in Germany within a maximum of 3 months after decommissioning the old installation. The allocation for an old installation

can be transferred on the same basis to a new installation run by a different operator if the two operators have concluded a contractual agreement about the transfer.

Upon application to the DEHSt, annual allowances allocated to the old installation may be transferred to the new installation for a period of four years (**transfer rule**). Following this transfer period, allocations to the new installation will be based on a compliance factor of 1 for the next 14 years. The allocation will then be derived from the annual average emissions of the new installation in the reference period, as determined by the relevant National Allocation Plan. In this case, the new installation will not be granted an allocation under the new entrant rule.

When applying to the DEHSt for a transfer, the operator of the new installation may request that the 3-month deadline be extended to a maximum of 2 years, providing that he demonstrates the infeasibility, on technical grounds or due to other framework conditions, of commissioning the new installation within 3 months of decommissioning the old one. In this event, in the same manner as described in Section C.3.2, no further allowances will be issued for the old installation. Issue of transferred allowances for the new installation will commence when the new installation begins operation and will follow the same schedule as allowances issued to new entrants. In calculating the quantity of allowances to be transferred, extensions to the 3-month deadline will incur a proportional reduction.

Allocations for the period 2008–2012 derived from a transfer from an old to a new installation during the period 2005–2007 will be based on the historical emissions of the old installation during the reference period used to define the allowance in 2005–2007 and on the compliance factor for the period 2008–2012.

Operators of new installations seeking to make use of the transfer rule must indicate the capacity of their installations in the application to the DEHSt for an allocation. If the capacity of the new installation exceeds that of the old installation, they can apply for an extra allowance equal to the difference to be allocated under the rules for new entrants. If the capacity of the new installation is lower than that of the old installation, the difference will be dealt with under the closure rules. In other words, the proportion of the allowances accounted for by the difference in capacity will not be re-issued during the next round.

Allowances may only be transferred if the new installation produces comparable products to the old installation. Section F includes a list of installations with comparable products.

If the new installation is commissioned before the old installation closes (parallel operation), application can be made for the new installation to be granted an allocation of allowances under the rules for new entrants for a period of up to 2 years until the old

installation is decommissioned. The combined claim for treatment under the transfer rule and the parallel operation rule may not exceed 18 years. Installations that have already been operating for more than 2 years do not qualify to receive a transfer.

The rules permit the allowances of several old installations to be transferred to one new installation, and the allowances from one old installation to be transferred to several new installations. The principles outlined above for the treatment of differences in capacity then apply in each case to the sum total of old or new installations concerned. The DEHSt will keep records to ensure that the transfer of allowances from an old to a new installation only occurs precisely once.

### **3.4 Modernisation incentive for existing installations from 2008**

Substantial reductions in CO<sub>2</sub> emissions can be achieved by replacing old power generation plant, where age and the technology in use result in above-average specific emission values. With this purpose in mind, the deduction rule offers an incentive to modernise existing installations with high relative emission levels. This rule will be applied in the electricity sector.

The rule applies to all condensing power stations fired by lignite or coal that are more than 30 years old and have a net degree of effectiveness of less than 31% (lignite) or 36% (coal). Age is established on the basis of the first time the installation entered operation. This rule will not be applied until trading period 2008–2012.

From 2008 15% will be deducted from the annualised baseline emissions recorded for these installations. In other words, the compliance factor (cf. Section C.6.) is reduced by 0.15. If the allowance is transferred from an old installation to a new installation, this deduction factor will not apply.

The DEHSt will check the data from operators to identify installations subject to this deduction rule and will reduce the size of the allowance issued to these installations accordingly.

### **3.5 New entrants and the new entrant reserve**

#### *3.5.1 Allocation rules for new entrants*

New entrants are installations commissioned from 1 January 2005 onwards. Capacity extensions in existing installations are similarly treated as new entrants, although this classification will refer exclusively to the extension and not to the installation in its entirety. The same applies if an existing installation did not fall within the scope of the

Directive prior to such extension. In this case the existing installation will be granted an allocation according to the rules outlined in Section C.3.1.

New entrants, like existing installations, will receive their allowances free of charge provided that they lay no claim to the transfer rule (cf. Section C.3.3). As the allocation rules for existing installations (grandfathering) cannot be applied here, new entrants are granted their allocation on the basis of benchmarks derived from the best available technology (BAT). The underlying principle of this benchmarking is to grant consistent allocations for comparable products on the basis of a specific emission factor per unit of output (e.g. kWh or t).

The quantity of the allowance for the period is determined by the product of installation capacity, projected average utilisation, the product group benchmark and the ratio of time from commissioning until end of period to full duration of period (cf. also Section G, List of formulae).

All new entrants will be granted an allowance for 2005–2007 and for 2008–2012, derived from a BAT-based specific emission value. This value will remain unchanged until 2012. No compliance factor will be applied for fourteen years from the commissioning of a new entrant.

Benchmarks are to be established for **installations with comparable products**. These benchmarks will be derived from the best available technology for new installations in that class.

Each product category will have its own benchmark. Such benchmarks are designed to encourage competition around the production process with the best CO<sub>2</sub> performance. However, benchmarking only serves its purpose if the products concerned are sufficiently comparable. In the light of the information available at present, the following products will be considered sufficiently comparable for the first trading period 2005–2007:

- electricity
- hot water
- process steam
- cement clinker
- container glass
- flat glass
- bricks
- roof tiles.

The electricity benchmark is 750g carbon dioxide equivalent/kWh. This value is derived from the weighted average of emissions from power generation in modern lignite, coal

and gas-fired power plants.

For power stations using fuel with a lower specific emission value than 750g carbon dioxide equivalent/kWh, the allowance will not exceed actual requirements but will be at least 365g carbon dioxide equivalent/kWh. The minimum allocation is based on emissions from a modern gas-fired power station.

For hot water the Act on the National Allocation Plan will fix a challenging benchmark.

The other benchmarks will be specified in a separate Ordinance. Allocations for new combined heat & power (CHP) installations will follow a specially conceived benchmark rule (cf. Section C.4.3.3).

New entrants with products for which there are *no defined benchmarks* will be granted an allowance based on the best available technology identified for the specific type of installation.

The quantity of the allowance is determined by the product of installation capacity, projected average utilisation, the specific emissions value for the best available technology in that type of installation and the ratio of time from commissioning until end of period to full duration of period (cf. also Section G, List of formulae).

When applying to the DEHSt for an allocation, the operator must enclose an expert report on the characteristic features of the installation which are relevant to determining the allowance. This report must demonstrate that determination of the specific emission value was based on best available technology.<sup>9</sup> The DEHSt will verify the data and may correct excessively high figures.

Allowances for new entrants are issued in proportion to the calendar years. In its first year of operation the new entrant will be issued its allowance for the current year along with the allocation, if such allocation occurs after 28 February. If allocation occurs before 28 February the allowance will be issued on 28 February. The same applies to all remaining years in the trading period.

If the actual activity rate during the operation of the installation is lower or higher than the level used to calculate the allowance, new entrants will be subject to *ex-post* adjustment. Such adjustment will not take place until the installation has been in operation for at least a full calendar year. When allowances for the following year are issued, any surplus allowance will be subtracted from the new calculation.<sup>10</sup> If activity is higher than

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<sup>9</sup> If it is not customary in the sector concerned to use biogenic fuels, the calculation must be based on the lowest-emission fossil fuel (usually natural gas).

<sup>10</sup> The purpose of the *ex-post* adjustment is to ensure that forecast activity data reflects realistic expectations and is not systematically overestimated in order to obtain a greater allowance.

assumed in the calculation of the allowance, the additional allowance will be added to the calculated allowance for the next annual issue. The original allocation decision will be amended accordingly.

To permit the DEHSt to establish the correct quantity for *ex-post* adjustment prior to issuing the next round of allowances (by 28 February of each year at the latest), the operators of new entrants are required to inform the DEHSt by 31 January of the following year what their actual average activity level has been.

### 3.5.2 Reserve

To permit the allocation of allowances to new entrants free of charge, a proportion of the total budget for installations participating in emissions trading will be set aside (New entrant reserve, cf. also Part B).

This reserve is calculated to ensure that an adequate quantity of allowances will be available for all expected new entrants. Allowances in the reserve that have not been allocated by the end of the allocation period will be cancelled by the DEHSt. If investment turns out to be more dynamic than predicted when the allocation plan was drawn up, the operator must purchase emission allowances from the market.

For the period 2005–2007, the rules for new entrants (cf. Section C.3.5.1) result in a total allowance of 27 Mt CO<sub>2</sub>. However, as it can be assumed that the overwhelming majority of installations built under the CHP Act will draw on the transfer rule, the requirement for the new entrant reserve is reduced to 9 Mt CO<sub>2</sub> for the period 2005–2007, or 3 Mt CO<sub>2</sub> per year.

A compensation of 1.5 Mt CO<sub>2</sub> per year has been provided for the period 2005–2007 in return for the closure of the nuclear power stations at Stade and Obrigheim. This compensation is a transition rule and has been restricted to the first trading period. From 2008–2012 investments to substitute decommissioned nuclear power plants will result in allowances being allocated from the new entrant reserve.

## 4. *Special allocation rules*

### 4.1 **Early action**

A compliance factor of 1 may, on application, be applied to existing installations which have been modernised and to newly built installations if (re-)commissioning occurred between 1 January 1996 and 31 December 2002. Existing installations qualify as early action installations if they can demonstrate a predefined reduction in specific CO<sub>2</sub> emissions, provided that these reductions were not achieved simply by decommissioning plant and/or a decline in productive output. Moreover, measures to reduce specific emissions will not be ranked as early action measures if they were substantially funded by public means or if they would have been required in any case due to legal stipulations.

The following requirements apply to existing installations:

<b>Year commissioned</b>	<b>Reduction in specific emissions to be demonstrated (%)</b>
1996	8
1997	9
1998	10
1999	11
2000	12
2001	13
2002	14

If an installation was newly commissioned between 1 January 1996 and 31 December 2002, it is assumed to have achieved at least the defined reduction in specific emissions. There is, therefore, no need to supply evidence.

The reduction in emissions is determined by the change in average annual emissions per unit of output. This is done by subtracting average specific emissions during the reference period (2000 to 2002) from average specific emissions during an earlier reference period. The reference period consists of three calendar years in succession (cf. also Section G, List of formulae).

To determine the increased efficiency of CHP installations, the unit used to measure productive output is 1 megajoule of heat generated. If the modernised installation was only generating power during the reference period, the unit used to measure productive output is 1 kilowatt-hour of power generated.

Having examined the findings of the data collection survey, the German government

estimates that, on the basis of this rule, about 100 Mt CO<sub>2</sub> will be subjected to a compliance factor of 1.

The German government intends to grant this compliance factor of 1 to early-action installations for a period of 12 years from the date of original commissioning or modernisation.

## 4.2 Process-related emissions

Process-related emissions are defined as the atmospheric release of CO<sub>2</sub> resulting from a chemical reaction other than combustion.

The (process-related) CO<sub>2</sub> emissions to which a compliance factor of 1 will apply in pig iron production and the use of blast furnace gas are determined on the basis of ideal carbon demand for the reduction of iron ore (414.1 kg carbon/tonne pig iron) and other carbon inputs (carbonates) minus the carbon content of the pig iron (47 kg carbon/tonne) and other carbon outputs.

The (process-related) CO<sub>2</sub> emissions to which a compliance factor of 1 will apply in the manufacture of oxygen steel and the use of converter gas are determined on the basis of the carbon content of the pig iron used (47 kg carbon/tonne pig iron) and other carbon inputs (carbonates), minus the carbon content of the manufactured steel and other carbon outputs.

The distinction between process-related emissions and energy-related emissions is thus consistent with the definition in the EU Monitoring Guidelines<sup>11</sup> while incorporating the above-mentioned specification.

When allocating allowances to installations which wholly or partly generate process-related CO<sub>2</sub> emissions, the process-related CO<sub>2</sub> emissions are evaluated with the **compliance factor of 1**. By contrast, allowances for energy-related CO<sub>2</sub> emissions are calculated on the basis of the rules described in Section C.6 using the generally applicable compliance factor (cf. also G, List of formulae).

This special treatment is granted on the basis of Criterion 3 in Annex III of the Directive (see Box 2 in Section A), which specifically provides that the technological potential for

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<sup>11</sup> The Monitoring and Reporting Guidelines adopted by the Monitoring Committee on 24 November 2003 as a Draft Commission Decision define process-related emissions as: “greenhouse gas emissions other than 'combustion emissions' occurring as a result of intentional and unintentional reactions between substances or their transformation, including the chemical or electrolytic reduction of metal ores, the thermal decomposition of substances, and the formation of substances for use as product or feedstock” (Draft Commission Decision establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council., p 6).

reductions shall be taken into account.<sup>12</sup> To restrict administrative effort to a minimum, a **de-minimis threshold** is applied, below which no special treatment will be granted. If process-related CO<sub>2</sub> emissions account for 10% or less of the total CO<sub>2</sub> emissions of an installation or bubble, the rules in Section C.6 will apply to total CO<sub>2</sub> emissions.<sup>13</sup>

The operator whose installation ultimately releases the CO<sub>2</sub> into the atmosphere is responsible for indicating the level of process-related emissions separately in reporting to the DEHSt. This operator will then be allocated accordingly to the special rules for process-related emissions.

In documenting these process-related CO<sub>2</sub> emissions, the operator will comply with the rules for allowance applications and emissions reports. The process-related emissions generated in pig iron production which cannot be used downstream in the form of thermal energy are determined by the CO<sub>2</sub> content of total blast furnace gas. When allocating allowances, this process-related component of CO<sub>2</sub> emissions is in each case attributed to the end user of the blast furnace gas, which means applying a compliance factor of 1.

Provisional estimates suggest that approx. 61 Mt carbon dioxide per year will fall under these special rules for process-related emissions in Germany.<sup>14</sup> This volume of CO<sub>2</sub> emissions will be taken into account when calculating the compliance factor. The higher the value for process-related emissions, the more stringent the compliance factor must be for energy-related emissions.

## 4.3 Combined heat & power

### 4.3.1 Preliminary remarks

Combined heat & power generation (CHP) is an important option in any strategy to cut CO<sub>2</sub> emissions for reasons of both cost structure and reduction potential. CHP installations therefore have a particular role to play in the EU emissions trading scheme, both in the production of district heating for residential purposes and in an industrial environment.

There is a specific problem here in that CO<sub>2</sub> emissions are higher when power and heat are generated together compared to the sole power-generation. Therefore, negative

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<sup>12</sup> “Quantities of allowances to be allocated shall be consistent with the potential, including the technological potential, of activities covered by this scheme to reduce emissions.” Criterion 3, Annex III, Directive.

<sup>13</sup> The figure of 10% takes its cue from Commission proposals on Criterion 4 of Annex III, where 10% was put forward as a threshold for giving consideration to changes in emissions due to new legal requirements. See Section C.4.4.

<sup>14</sup> The German Greenhouse Gas Inventories in 2001 only indicated 24.4 Mt CO<sub>2</sub> for industrial processes. The difference between this figure and the above figure of 61 Mt CO<sub>2</sub> is due to the emissions from pig iron production, which are defined as process-related for NAP purposes but have not to date been included as such in the National Inventory.

incentives which might encourage the segregation of heat and power generation must be avoided.

Building on Criterion 8 of Annex III of the Directive, provision are made to prevent or offset such negative incentives and to ensure that no barriers to market entry ensue.

#### *4.3.2 Existing CHP installations*

Negative incentives for existing CHP installations can be offset by granting the operators of CHP installations additional allowances tied to CHP implementation. The purpose is to take appropriate account of the efficiency of CHP installations.

Germany's Act on the Preservation, Modernisation and Development of Combined Heat and Power Generation (Combined Heat & Power Act; KWKG) of 19 March 2002 contains adequate detail to define what does or does not constitute a CHP installation.

It defines combined heat and power generation as the simultaneous conversion of energy input into electrical energy and useful heat. CHP power generation is, thereby, the proportion of electrical output directly associated with the generation of useful heat. The ratio of CHP net power generation to CHP useful heat generation within a defined period is expressed by a power coefficient.

The Combined Heat & Power Act describes the following mechanism for quantifying the power generated from CHP. By 31 March the operator of the CHP installation provides the competent authority (Bundesamt für Wirtschaft und Ausfuhrkontrolle, BAFA) and the network operator with an audited statement of account, compiled according to the acknowledged rules for the technology and showing the amount of CHP power fed into the grid during the year just concluded, as well as data on CHP net power generation and CHP useful heat generation and on the type and quantity of fuel used; the acknowledged rules are the principles and calculation methods published und regularly updated by the Arbeitsgemeinschaft Fernwärme e.V. in nos. 4 to 6 of Arbeitsblatt FW 308 (Certification of CHP Installations – Determining CHP Power).

This reference to CHP power permits the use of a precisely defined reference value derived by means of an attested procedure, which also incorporates installation efficiency in the form of the power coefficient.

For the period 2005–2007 the special allocation for CHP installations has been set at 27t CO<sub>2</sub> equivalent per gigawatt-hour (cf. also Section G, List of formulae).

With an annualised CHP power output of approx. 55 TWh in the reference period, a special CHP allocation of 27t carbon dioxide equivalent per gigawatt-hour for the period 2005–2007 results in an additional allowance requirement totalling approx. 4.5 Mt CO<sub>2</sub>,

or 1.5 Mt CO<sub>2</sub> per year.

The issue of CHP allowances in the first year will be based on CHP power generation during the reference period. In the next year, the issue will be adjusted in line with the actual CHP net power generation as documented. If CHP net power generation from an installation falls by less than or equal to 20% in comparison with the reference period, the quantity of the additional allowance granted under the CHP rule will be reduced by 5% for each percentage point of the reduction. If CHP net power generation falls by more than 20% in comparison with the reference period, the additional allowance will not be issued for the year in question.

#### 4.3.3 *New entrants in CHP*

Negative incentives for CHP might also result from free allowances for new entrants being awarded to CHP installations according to a simple benchmark for either heat generation or power generation.

To avoid this situation, an allocation for new CHP installations not applying for a transfer of allowances will be based on a dual benchmark: the power benchmark will determine the allocation for power output, and the heat benchmark will determine the allowance for heat output (cf. also Section G, List of formulae). Apart from this, new entrants in CHP are subject to the same rules (e.g. *ex-post* adjustment) as other new entrants (cf. Section C.3.5).

## 4.4 **Increased emissions due to legal requirements**

Criterion 4 in Annex III of the Directive states that the National Allocation Plan “shall be consistent with other Community legislative and policy instruments. Account *should be taken* of unavoidable increases in emissions resulting from new legislative requirements.” Accordingly, recent legal requirements which would directly influence the volume of emissions from installations subject to emissions trading were carefully reviewed. It emerged that, compared with the reference period 2000–2002, changes in emissions likely to occur due to these new legal requirements in the period 2005–2007 would fall below the de-minimis threshold of at least 10% proposed by the Commission.<sup>15</sup> No special treatment has therefore been designed for changes of this nature.

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<sup>15</sup> “In order to simplify administrative tasks the Commission recommends a Member State to consider a Community legislative or policy instrument only insofar as it is expected to result, per activity or in total, in a substantial increase or decrease (e.g. 10%) of covered emissions.” (Communication from the Commission on guidance to assist Member States in the implementation of the criteria listed in Annex III to Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, and on the circumstances under which force majeure is demonstrated, p. 11).

## 5. **Banking**

The EU Directive of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community provides in principle that allowances can be “banked”, i.e. put aside and used in a subsequent trading period. In this event, remaining allowances for the period which is about to terminate are cancelled and replaced by allowances for the period about to begin. The principle affirms that, while allowances for periods from 2008 onwards can be transferred to the following period, it is left to Member States to establish how allowances from 2005 can be deferred. In other words, each Member State will decide whether allowances granted for the first trading period can be banked for 2008.

*Box 5 Provisions of the EU Directive on banking in the National Allocation Plan for 2005–2007*

Whereas 9:

“Member States may provide that they only issue allowances valid for a five-year period beginning in 2008 to persons in respect of allowances cancelled, corresponding to emission reductions made by those persons on their national territory during a three-year period beginning in 2005.”

Article 13 (2):

“Four months after the beginning of each subsequent five-year period referred to in Article 11(2), allowances which are no longer valid and have not been surrendered and cancelled in accordance with Article 12(3) shall be cancelled by the competent authority.

Member States may issue allowances to persons for the current period to replace any allowances held by them which are cancelled in accordance with the first subparagraph.”

Banking should be welcomed on both ecological and economic grounds. It encourages early reductions in emissions and the innovative effects these can trigger. It offers operators greater flexibility in scheduling their measures and will reduce volatility in the price of allowances towards the end of a trading period.

There is, however, a problem associated with banking allowances from the period 2005–2007 for later use in 2008–2012, because it would actually increase total allowances during the Kyoto commitment period. A Member State which enables allowances to be banked for the trading period 2008–2012 would thereby be making it harder to its achieve Kyoto targets.

National Kyoto targets would be jeopardised further by the lack of harmonisation with regard to banking arrangements in Europe, because the differences may lead to substantial international inflows of allowances. In Member States which permit banking,

a great demand could accumulate for this option, exposing national emissions accounts to considerable pressure. Banking allowances from the first trading period would, therefore, entail barely calculable risks.

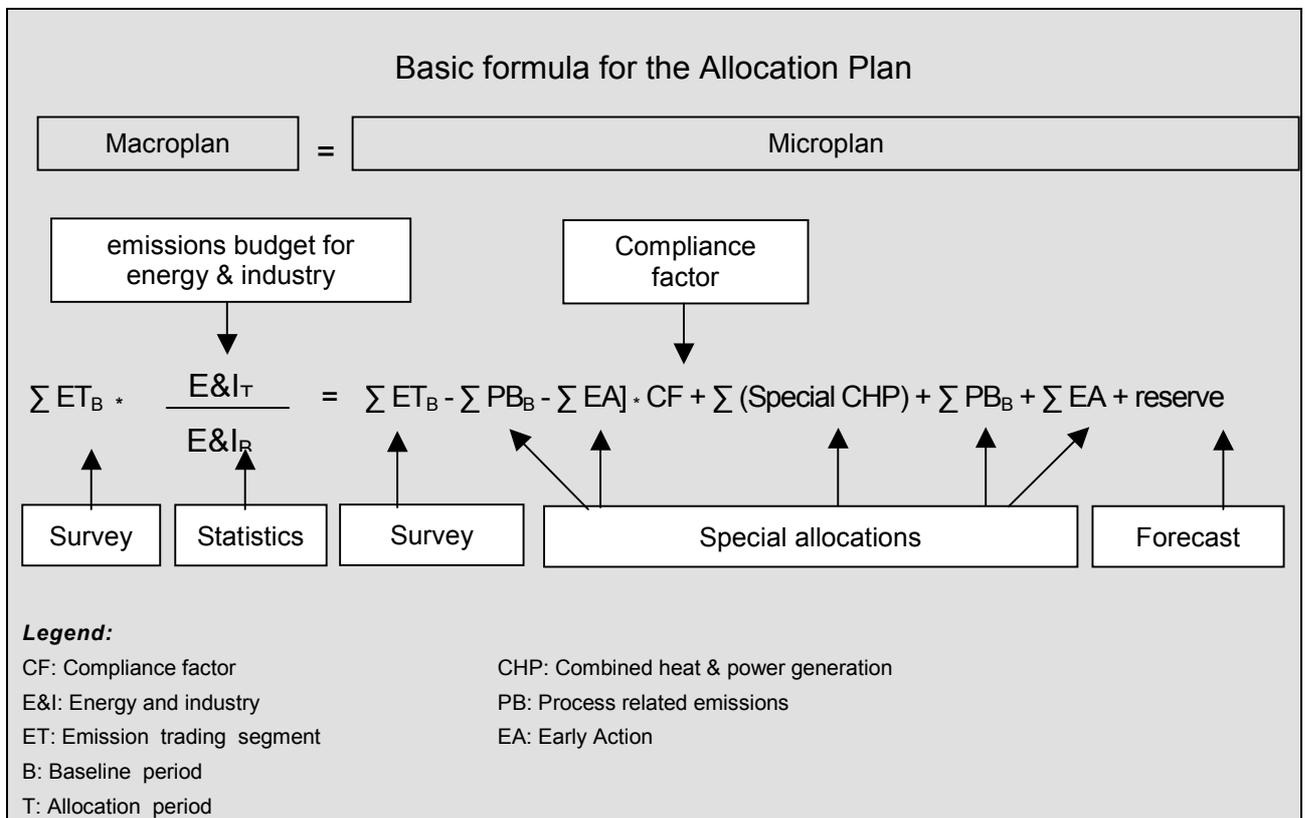
An arrangement which limits banking options in line with emission reductions achieved on national territory can contain these risks, but it cannot eliminate them altogether. Here again, the overall expected volume of banking would have to be accounted for in the next National Allocation Plan, with unavoidably negative distribution effects.

That is why Germany will not permit the transfer of allowances from the first to the second trading period.

## 6. Calculating the compliance factor

The compliance factor serves to reconcile the Macroplan with the Microplan, taking into account the reserve and the special allocations. The box below shows the principal steps involved in calculating the quantities to be allocated in the Macro- and Microplan and ensuring budget compatibility on the basis of the compliance factor as a key formula in the Allocation Plan. The Macro- and Microplan must reach the same result in calculating the total allowances to be granted to the installations listed in the Allocation Plan. That is why both sides of the equation budget express the total quantity of allowances allocated.

Box 6 Calculating total allocations for the Macro- and Microplan



Both the macroplan and the microplan take as their initial point CO<sub>2</sub> emissions in the emissions trading segment, derived from the data collection survey on the reference period 2000–2002 carried out among installations:

- The Macroplan defines the emissions budget for the Microplan. This is determined by the ratio of total CO<sub>2</sub> emissions in the reference period 2000–2002 from all installations subject to emissions trading to the emissions budget for the energy and industry sectors in the period 2005–2007.
- The Microplan is based on the CO<sub>2</sub> emissions of individual installations in the reference period 2000–2002. These are multiplied by a compliance factor. When determining this compliance factor, the total of all special allocations (e.g. for early action) and the requirement for the new entrant reserve are also taken into account. In this manner Microplan is balanced with the Macroplan.

The special allocation for combined heat & power generation arises from the total budget earmarked for this purpose. By contrast, the special rules for process-related emissions and early action are based on the principle that no compliance factor is applied here. Taking these different modes of application into account, the basic formula for the Allocation Plan results in the following formula for the compliance factor.

*Box 7 Formula for calculating the compliance factor*

$$CF = \frac{\sum ET_B * \frac{E\&I_T}{E\&I_R} - \text{reserve} - \sum PB_B - \sum EA - \sum (\text{Special CHP})}{\sum ET_B - \sum PB_B - \sum EA}$$

**Legend:**

CF: Compliance factor	CHP: Combined heat & power generation
E&I: Energy and industry	PB: Process related emissions
ET: Emissions trading segment	EA: Early action
B: Reference period	
T: Allocation period	

The numerical basis for calculating the compliance factor for the period 2005–2007 is described below, along with the outcome.

Following the requirements of the Macroplan, the emissions budget for the energy and industry sectors must be reduced by 0.4%. This means applying a reduction factor of 0.996 to the entire emissions trading segment.

- A compliance factor of 1 is applied to process-related emissions and to early action measures.
- The reserve and the special allocation for CHP must be deducted from the total budget for remaining installations.

The difference is used to calculate the compliance factor for non-process-related CO<sub>2</sub> emissions in the emissions trading segment. The greater the weight of the special factors, the more demanding the compliance factor will be.

The following details form the basis for calculating the compliance factor:

According to the data collection survey, average annual **total emissions** in the period 2000-2002 for the installations participating in emissions trading amounted to 501 Mt CO<sub>2</sub>.

The **Reserve** requires 3 Mt per year, or 9 Mt altogether for the period 2005–2007. In addition, there is a special allocation of 1.5 Mt CO<sub>2</sub> per year for the phasing out of nuclear power. For non-process-related CO<sub>2</sub> emissions in the emissions trading segment during the reference period, this yields a corrective factor of 0.0090.

**Process-related emissions** are 61 Mt per year. The compliance factor applied to these emissions is 1, and the special allocation implicitly associated with it results in a corrective factor of 0.0028.

1.5 Mt per year is earmarked for the special treatment of **combined heat & power generation**, entailing a corrective factor of 0.0030.

The special allocation for **early action** leads to a corrective factor of 0.0047.

The **compliance factor** for non-process-related CO<sub>2</sub> emissions is, therefore, **0.9765**. This means that individual allocations where no special allocations apply are 2.35% lower in the first trading period than corresponding emissions in the reference period 2000–2002.

*Box 8 Components of the compliance factor for the period 2005–2007*

Compliance factor	=	Reduction factor	–	Reserve	–	Process-related emissions	–	Early action	–	Special allocation
0.9765		0.9960		0.0090		0.0028		0.0047		0.0030

## D. List of abbreviations

BAT	Best available technology
BDI	Bundesverband der Deutschen Industrie e.V. (Confederation of German Industry)
BImSchV	Bundesimmissionsschutzverordnung (Ordinance implementing the Federal Immission Control Act)
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
CF	Compliance factor
CH <sub>4</sub>	Methane
CHP	Combined heat and power
CO <sub>2</sub>	Carbon dioxide
DEHSt	Deutsche Emissionshandelsstelle (German Emission Allowance Trading Authority)
DIN FW	German District Heating Standard
E&I	Energy and Industry
EC	European Community (territory)
EC	European Council (decision-making body)
EEC	European Economic Community
EnEV	Energieeinsparverordnung (Energy Saving Ordinance)
ET	Emissions trading
EU	European Union
GG	Greenhouse gases
G&S	Gas and steam (co-generation) power station
GZ	German quality assurance label (cf. RAL)
HFC	Hydrofluorocarbons
IPPC Dir.	Directive on Integrated Pollution Prevention and Control
KfW	Kreditanstalt für Wiederaufbau (German Reconstruction Bank)
KWKG	CHP Act (Germany)
N <sub>2</sub> O	Nitrous oxide
NAP	National Allocation Plan
PB	Budget for process-related emissions
PFC	Perfluorocarbons
RAL	Deutsches Institut für Gütesicherung und Kennzeichnung (German Institute for Quality Assurance and Labelling)
SF <sub>6</sub>	Sulphur hexafluoride
T/C/S	Trade/Commerce/Service sectors

TEHG	Greenhouse Gas Emissions Trading Act
UBA	Umweltbundesamt (Federal Environmental Agency) (Germany)
UNFCCC	UN Framework Convention on Climate Change

### Mathematical units

A	year
G	gram
Kg	Kilogram
Km	kilometre
KWh	kilowatt-hour
m <sup>3</sup>	cubic meter
Mt	million tonnes
MW	megawatt
T	tonne
TJ	terajoule
TWh	terawatt-hour

## **E. Sources**

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Monitoring Committee: Draft Commission Decision establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council, 24 November 2003

Politiksznarien für den Klimaschutz – Langfristszenarien und Handlungsempfehlungen an 2012 (Politiksznarien III), Deutsches Institut für Wirtschaftsforschung, Forschungszentrum Jülich, Fraunhofer Institut Systemtechnik und Innovationsforschung, Öko Institut e.V., commissioned by the Umweltbundesamt, Berlin (forthcoming).

Ziesing, Hans-Joachim: Treibhausgas-Emissionen nehmen weltweit zu – Keine Umkehr in Sicht. In: Wochenbericht des DIW, no. 39/2003.

## **F. List of installations producing comparable products**

Installations that produce comparable products are those falling within the same class as listed below (cf. also Box 3):

- Class 1: Installations for power generation (including CHP installations) as licensed under nos. I to III, Annex 1 of 34. BImSchV.
- Class 2: Installations for generating steam, hot water, process heat or hot waste gas, including the necessary steam boiler (also combined heat and power plants) as licensed under nos. I to III, Annex 1 of 34. BImSchV.
- Class 3: Combustion facilities and gas turbines powering industrial machinery as licensed under no. VI or V, Annex 1 of 34. BImSchV.
- Class 4: Installations for the distillation or refining or other processing of petroleum or petroleum products in mineral oil or lubricant refineries as licensed under no. VI, Annex 1 of 34. BImSchV.
- Class 5: Installations for the dry distillation of coal or lignite (coke ovens) as licensed under no. VII, Annex 1 of 34. BImSchV.
- Class 6: Installations for the roasting, smelting or sintering of iron ores, as licensed under no. VIII, Annex 1 of 34. BImSchV.
- Class 7: Installations for the production or smelting of pig iron or steel including continuous casting as licensed under no. IX, Annex 1 of 34. BImSchV.
- Class 8: Installations for the production of cement clinkers as licensed under no. X, Annex 1 of 34. BImSchV.
- Class 9: Installations for the calcination of limestone or dolomite as licensed under no. XI, Annex 1 of 34. BImSchV.
- Class 10: Installations for the production of glass, also recycled glass, including installations for the production of glass fibres, as licensed under no. XII, Annex 1 of 34. BImSchV.
- Class 11: Installations for baking ceramic products as licensed under no. XIII, Annex 1 of 34. BImSchV.
- Class 12: Installations for extracting pulp from timber, straw or similar fibrous materials as licensed under no. XIV, Annex 1 of 34. BImSchV.
- Class 13: Installations for the production of paper or cardboard as licensed under no. XV, Annex 1 of 34. BImSchV.

## G. List of formulae

### 1. Free allocation based on historical emissions in the reference period (grandfathering)

Installations commissioned prior to 31 December 2002 whose process-related CO<sub>2</sub> emissions under the definition in Section C.4.2 make up equal to or less than 10% of total CO<sub>2</sub> emissions will receive a minimum allocation of emission allowances (EA) for the entire period according to the following formula:

$$EA = E_{BP} * CF_P * t_p + EA_{SA}$$

### 2. Free allocation based on historical emissions in the reference period (grandfathering) when process-related CO<sub>2</sub> emissions contribute more than 10% of the total

Installations commissioned prior to 31 December 2002 whose process-related emissions under the definition in Section C.3.2 make up more than 10% of total CO<sub>2</sub> emissions will receive emission allowances (EA) for the entire period according to the following formula:

$$EA = (E_{BP, tot} - E_{BP, proc}) * CF_P * t_P + E_{BP, proc} * t_P + EA_{SA}$$

### 3. Free allocation based on announced emissions

Installations commissioned between 1 January 2003 and 31 December 2004, or existing installations that fall under Annex I of the Emissions Trading Directive due to an extension of capacity and are thus subject to emissions trading, will receive emission allowances (EA) for the entire period according to the following formula:

$$EA = C * t_A * EV * t_P$$

*Ex-post* adjustments are applied based on actual annualised average activity levels, derived from the capacity of the specific installation and its utilisation.

#### 4. Free allocation for new entrants based on benchmarks or installation-specific emission values derived from BAT per product unit

Installations or extensions to installations commissioned from 1 January 2005 which are not combined heat and power installations will receive emission allowances (EA) for the entire period according to the following formula:

$$EA = C * t_A * BAT * \frac{RD}{TD_P} * t_P$$

*Ex-post* adjustments are determined by actual annualised average activity levels, derived from the capacity of the specific installation and its utilisation.

Emission values for the generation of heat and power are defined as: 750 g CO<sub>2</sub> equivalent/kWh (power generation in coal and lignite power stations) and 200 g CO<sub>2</sub> equivalent/kWh (heat generation). If power generating installations have a lower specific emission value, the allocation is adapted to the actual requirement, but will at least be 365 g CO<sub>2</sub> equivalent/kWh.

#### 5. Free allocation for new CHP entrants based on benchmarks

CHP installations or extensions to installations commissioned from 1 January 2005 will be issued emission allowances (EA) for the entire period according to the following formula:

$$EA = (AN_A * BAT_A + AN_Q * BAT_Q) * \frac{RD}{TD_P} * t_P$$

*Ex-post* adjustments are determined based on actual annual average activity levels for the generation of power and useful heat.

## 6. Allocation for early-action installations and installations commissioned since 1996

Installations that achieved a reduction of emissions in the period from 1 January 1996 until 31 December 2002 can apply for emission allowances according to the following formulae:

$$EA = EB_{P,tot} * CF \quad \text{whereby } CF = 1 \quad \text{if } \sum ER_{EP} > x \%$$

whereby

$$X = 8 \% \quad \text{if commissioned in 1996}$$

$$X = 14 \% \quad \text{if commissioned in 2002}$$

$$\text{and } \sum ER_{EP} = \frac{\frac{E_{RP,tot} - E_{RP,proc}}{P_{tRP}} - \frac{E_{BP,tot} - E_{BP,proc}}{P_{tBP}}}{\frac{E_{RP,tot} - E_{RP,proc}}{P_{tRP}}} * 100$$

Installations originally commissioned from 1996 onwards may apply for allowances according to the following formula:

$$EA = E_{BP,tot} * CF \quad \text{whereby } CF = 1$$

## 7. Special allocation for existing CHP installations

CHP installations commissioned prior to 31 December 2004 may receive a special allocation of allowances according to the following formula:

$$EA_{SA-CHP} = A_{Bne-CHP} * OF_{CHP} * t_p$$

*Ex-post* adjustments are determined on the basis of observed annualised average CHP net power generation.

## Key to abbreviations

<i>A<sub>Bne-CHP</sub></i>	annualised average CHP net power generation of a CHP plant during the reference period (in GWh/a)
<i>ANA</i>	power generated by a CHP installation (in MWh)
<i>AN<sub>Q</sub></i>	useful heat generated by a CHP installation (in MWh)
<i>BAT</i>	benchmark or installation-specific emission value based on best available technology per product unit (e.g. in t CO <sub>2</sub> equiv./MWh or t CO <sub>2</sub> equiv./t)
<i>BAT<sub>A</sub></i>	benchmark for power generation installations (in t CO <sub>2</sub> equiv./MWh)
<i>BAT<sub>Q</sub></i>	benchmark for heat generating installations (in t CO <sub>2</sub> equiv./MWh)
<i>C</i>	installation capacity (e.g. in MW or t/h)
<i>CF<sub>P</sub></i>	compliance factor for the allocation period
<i>EA</i>	volume of emission allowances for the allocation period (in t CO <sub>2</sub> equiv.)
<i>E<sub>BP, tot</sub></i>	annualised average total CO <sub>2</sub> emissions of an installation during the reference period (in t CO <sub>2</sub> equiv. per year)
<i>E<sub>BP, proc</sub></i>	annualised average process-related CO <sub>2</sub> emissions of an installation during the reference period (in t CO <sub>2</sub> equiv. per year)
<i>E<sub>RP</sub></i>	annualised average emissions of an installation during the reference period (in t CO <sub>2</sub> equiv. per year)
<i>EASA</i>	sum of special allocation allowances during the allocation period
<i>EASA-CHP</i>	sum of special allocation allowances for a CHP installation during the allocation period 2005–2007 (in t CO <sub>2</sub> equiv.)
<i>EREP</i>	emission reductions that took effect in the period from 1991 to 1996 or from 1991 to 2002 (as a percentage compared with a reference period)
<i>EV</i>	reported specific emission value for an installation per product unit (e.g. in t CO <sub>2</sub> equiv./ MWh or t CO <sub>2</sub> equiv./t)
<i>OF<sub>CHP</sub></i>	offset (or compensation) factor for combined heat and power plants set at 27 t CO <sub>2</sub> equiv. per GWh of CHP net power production
<i>Pt<sub>BP</sub></i>	average output of product units in the installation(s) during the reference period (e.g. in MWh or t)
<i>Pt<sub>RP</sub></i>	average output of product units in the installation(s) during the reference period (e.g. in MWh or t)
<i>RD</i>	number of days from commissioning until the end of the allocation period (residual days)
<i>t<sub>A</sub></i>	forecast annual average peak hour utilisation of an installation
<i>TDP</i>	total number of days in the specific allocation period (total days)
<i>t<sub>p</sub></i>	number of years in the allocation period

## **H. List of Installations**

(enclosed as separate Annex)



# **Annex I**

Proposal from the  
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety  
for a Cabinet Decision on 31 March 2004

## **Proposal for decision**

1. The Cabinet resolves to submit the National Allocation Plan to the EU Commission for notification in accordance with Article 9 of EU Directive 2003/87/EC.
2. The Federal Government emphatically confirms the need for internationally coordinated climate protection measures and works for a speedy entry into force of the Kyoto Protocol.
3. This decision on the National Allocation Plan is taken in the expectation that all EU Member States will duly exercise their responsibility for climate protection in the spirit of EU Directive 2003/87/EC and in line with the burden sharing agreed upon ratification of the Kyoto Protocol. The European Commission is responsible for examining the Allocation Plans of the Member States according to a uniform standard and for ensuring that no distortions to competition occur within the European Union. The final decision on the quantified framework and on allocation rules will be taken by German Bundestag by means of a National Allocation Plan Act in the light of notifications by the Commission.
4. In the ongoing negotiations on the JI/CDM Directive, the Federal Government will strongly work for an agreement with the European Parliament at the first reading in order that CDM projects can be included in EU emissions trading from 1 January 2005, and JI projects, from 1 January 2008.

## Annex II

### Amendments to the National Allocation Plan (NAP) following the National Allocation Plan Act (NAP-G)

On 21 April 2004 the German Cabinet adopted an Act regulating the National Allocation Plan for Greenhouse Gas Emissions in Allocation Period 2005 to 2007 (NAP-G). This decision entails several amendments to the NAP adopted by the Cabinet on 31 March 2004 and notified to the EU Commission. The most important of these are as follows:

- 1) The **compliance factor** will be **0.9755** (emissions reduced by **2.45%**). The compliance factor previously stated in the NAP was 0.9765 (reduced by 2.35%). This amendment is due to an extended application of the early action mechanism (see below) which results in a higher figure for emissions at the compliance factor of 1 (114 Mt CO<sub>2</sub> p.a. for early action instead of 100 Mt CO<sub>2</sub> p.a.).
- 2) The **early action** mechanism has been modified in the following respects:
  - Applications for early action status can be made for **modernisation** completed from **1 January 1994** onwards (rather than 1 January 1996). The reference period for evidence of specific emission reductions consists of three consecutive calendar years during the period 1991 to 2001.
  - Applications for a compliance factor of 1 may be made for **twelve years after completion of the modernisation**.
- 3) **Choice between early action and CHP mechanisms:** An operator who applies for early action status and is granted a compliance factor of 1 may not, in addition, receive the special allowance for a combined heat & power installation.
- 4) **Hardship clause:** If, as a result of particular circumstances (notably protracted downtime due to repairs or modernisation, or below-capacity operation to permit phased expansion), an allowance determined by historical emissions during the baseline period turns out to be at least 30% lower than might have otherwise been expected and if this places the company at an unacceptable commercial disadvantage, application may be made for the allowance to be determined as if the particular circumstances had not occurred.
- 5) The **benchmark** (specific emissions value) used to determine allowances for **new entrants** (additional installations) will remain **unchanged for 14 years**. (The NAP of 31 March 2004 limited its use provisionally to 2012.)
- 6) **Termination of operation:** The **criterion** defined in the NAP for “**de facto termination of operation**” (emissions less than 10% of annualised average baseline period emissions) will **not take effect**. This criterion is of negligible practical significance, given that *ex post* adjustment will be made whenever emissions fall below 60% of annualised baseline emissions.