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Treatment of cogeneration in National Allocation Plans

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COGEN Europe urges Member States to adopt phase-1 best practices for the treatment of cogeneration in phase-2 in the EU Emission Trading Scheme

COGEN Europe urges Member States to harness the EU ETS for the promotion of energy efficiency by ensuring that cogeneration installations are allocated enough allowances to cover all of their emissions under the National Allocation Plans currently under preparation. Cogeneration, as the most efficient conversion technology, should not be submitted to reduced allocations of emission allowances.

High efficiency cogeneration is clearly identified as a “clean technology” in Commission guidelines COM(2003)830, while recital 20 of the ETS Directive (2003/87/EC) explicitly states that the “Directive will encourage the use of more energy-efficient technologies, including combined heat and power technologies.” Moreover, criterion 8 of Annex III to Directive 2003/87/EC¹ states that National Allocation Plans “shall contain information on the manner in which clean technology, including energy efficient technologies, are taken into account.”

For phase-2, which will be the first regular five year period (2008-12), **Member States should take the lessons from the experimental phase-1 trading period into account and design their NAPs according to the best practice examples set in phase-1 NAPs**, and described in the Annex on Best Practices.

Besides complying with the ETS Directive, National Allocation Plans offer Member States the opportunity to meet their commitments under the Directive on Energy end-use efficiency and energy services (2006/32/EC) and Directive 2004/8/EC on the promotion of cogeneration.

Directive 2006/32/EC requests that Member States submit to the European Commission a national Energy Efficiency Action Plan (EEAP) by 30 June 2007. The allocation methodologies embedded in the NAPs can form an integral part of the EEAPs. At the same time, phase-2 NAPs can be instrumental in bringing high efficiency cogeneration closer to the national potential, in accordance with the objectives set in Directive 2004/8/EC on the promotion of cogeneration.

COGEN Europe recognises that Member States have used and will continue to use different allocation methodologies. It is essential however that Member States make use of all policy tools at their disposal under the European Emission Trading Scheme to incentivise high efficiency cogeneration properly, thereby allowing for the wider deployment of this energy efficient technology. An Annex on Recommendations is included in this Position paper.

Benchmarking

The “benchmarking approach” is the most common promotion tool for high efficiency cogeneration. The two reference values (tonnes of CO₂ emitted per GWh of electricity and TJ of heat) are multiplied with the output values (GWhe and TJ) in order to determine the allocation to the installation. Thus, efficient installations performing better than the benchmark receive enough allowances to cover their emissions, whereas inefficient installations are short of allowances and thereby incentivised to improve efficiencies. For phase-1, benchmarking systems promoting high efficiency cogeneration are to be found in Germany, the Netherlands and Poland.

Best practice example for using the benchmarking principle: Germany

In Germany, existing cogeneration plants can opt for an allocation based on a double benchmarking-method in NAP1. Under this system, the allocation of allowances is based on a comparison with BAT (“best available techniques”) for the separate generation of power and steam. Thus, the higher efficiency achieved through cogeneration is automatically rewarded. Depending on the fuel and the technology, the specific emission factor for the electricity generation benchmark ranges from 365 to 750 tCO₂ per GWhe. For steam, the emission factor ranges from 225 to 345 tCO₂ per GWh. In addition to this initial allocation, there is a bonus allocation for cogenerated electricity during the reference period of 27 tCO₂ per GWh. In effect, the bonus lowers the benchmark for cogeneration.

Creation of a cogeneration sector

In contrast to the benchmarking approach, the “sectoral approach” starts from the overall national allocation limit, breaks it down by industrial sectors, and then calculates the allocation at installation level as a final step. With each Member State free to determine the number and shape of the sectors, some countries have created a specific cogeneration sector and given it a preferential treatment to the separate heat and power production sectors. For phase-1, such a system was applied in Finland, Hungary and Poland. For phase-2, the United Kingdom is also aiming at creating a specific cogeneration sector.

Best practice example for establishing a cogeneration sector: Portugal

For NAP1, Portugal has chosen a top-down approach for allocating its allowances. The installations covered by the emissions trading scheme are divided into nine sectors, cogeneration being one of them. While there is no support mechanism for cogeneration in place at the installation level, the cogeneration sector as such is given special treatment as 25% of extra allowances are earmarked for the growth of the cogeneration sector during the first trading period. In the case of non-cogeneration power production a shortfall of 9% compared to the emissions of 2002 is foreseen. This approach takes the huge and currently underused potential for high efficiency cogeneration in Portugal into account.

Taking out the compliance factor

Taking out (or softening) the compliance factor is the second-most used mechanism for using the NAPs as a promotional tool for cogeneration. This mechanism can be employed when grandfathering has been chosen as the guiding principle and no distinct cogeneration sector has been created. The compliance factor, (also dubbed “potential of technologic improvement factor” or “progress factor”), which directly results from the intra-sector division of allowances and which is valid for the entire sector, can be taken out by applying the default value of 1 for cogeneration installations. This approach (with country-specific variations) is used for example in Austria, Belgium, France, Greece and Spain.

Best practice example for taking out the compliance factor: Greece

The Greek NAP1 foresees a favourable treatment for existing cogeneration plants and reads: “With respect to the emissions from combustion, it is considered vital to promote and support cogeneration.” In Greece, the allocation of allowances follows the grandfathering principle, where every sector receives a specific growth factor and a compliance factor. While for non-cogeneration installations the compliance factor is set below 1 and then multiplied with the allocation basis (e.g. a reduction target of 8% leads to the compliance factor 0.92), the compliance factor is automatically set at 1 for cogeneration installations. Thus any sector specific reduction target is taken out. In the Greek NAP1, only cogeneration benefits from this mechanism, a testimony to the efficiency credentials of this technology.

Production-based premium

The production-based premium is the simplest mechanism for the promotion of high efficiency cogeneration. Per GWh of cogeneration production, an additional amount of allowances is allocated to the installation. This approach implies that one part of the allowances pool is earmarked for cogeneration at the beginning of the process of designing the allocation plan. The production-based premium can be introduced into both the benchmarking and grandfathering systems. Member States, which use a production-based premium include the Czech Republic and Germany.

Best practice example for a production-based premium: Czech Republic

In the Czech Republic, cogeneration plants receive a bonus of 430 allowances for every GWh of electricity produced. Assuming a price of €25 per allowance, this mechanism supports electricity from cogeneration (both electricity consumed on-site and exported to the networks) by around €cent 1.1 per kWh. The Czech NAP1 is the only one which allows for a direct quantification of support given to cogeneration. 1.5% of all allowances are earmarked towards this production-based cogeneration premium in phase-1. Should applications for the premium exceed the earmarked amount, the extra allocation will be equally cut back among the installations.

The following sections offer policy recommendations for those Member States that wish to help develop their cogeneration markets in full compliance with Directive 2003/87/EC and Directive 2004/8/EC. Of the 15 phase-1 NAPs analysed, it was possible to distinguish between several generic approaches chosen by the Member States; the recommendations presented in this Annex has been divided accordingly.

NAPs that follow the benchmarking approach:

These NAPs inherently incentivise clean technologies and processes by using a reference value (e.g. tonnes of CO₂ emitted per GWh), and can be regarded as being the “fairest” method of allocating allowances. In order to adapt these NAPs according to the best practice example, Member States should consider four principles:

(1) There should be no “cogeneration malus” in the allocation formula. The “malus” shields of separate production of electricity and heat from the competition of cogeneration plants by raising the benchmarks for cogeneration plants. Investment in cleaner technology becomes less attractive; the main purpose of the EU ETS is twisted to the opposite.

(2) The benchmarks should be differentiated between fuel inputs. Where this is not the case, investments will be directed towards fuels with the lowest carbon content per calorific value (natural gas) and only to a limited extend towards cleaner technologies and processes. Such practices contradict not only the purposes of Directive 2004/8/EC but also of the EU ETS, which aims at promoting cleaner technologies and not cleaner fuels.

(3) There should be a production premium for high efficiency cogeneration. Such a premium would – in full accordance with Directive 2004/8/EC – lower the benchmark for highly efficient cogeneration production, and give a clear incentive for the use of cleaner processes. It should be noted that “high efficiency cogeneration” is defined as providing primary energy savings of at least 10% compared to separate production of electricity and heat.

(4) The benchmarks should be based on best available techniques (BAT) under operational conditions and not on average emission levels. Only ambitious benchmarks give the clear signal to the private sector that the policy-makers ask for re-investments in cleaner ways of producing electricity and power. Benchmarks based on average emission levels are too lenient and will not achieve the desired results. An alternative is to use a mix between BAT and average emissions, with a floor for the cumulative benchmark (heat and power) no lower than 630kg per MWh of power output.

NAPs that include a specific cogeneration sector:

These NAPs reflect the fact that of all sectors covered by the EU ETS cogeneration holds a special potential of contributing to the reduction of greenhouse gas emissions. Member States that have chosen this path should consider two principles:

(1) When deciding the allocation of allowances between sectors, the growth potential for high efficiency cogeneration should be taken into account. Following Directive

2004/8/EC, Member States will during this year carry out studies on the national 2010, 2015 and 2020 potentials for high efficiency cogeneration. These results should be part of the basic considerations when deciding on the growth factor for the cogeneration sector.

(2) The definition of the cogeneration sector should be based on the definition given in the Directive 2004/8/EC. In order to be coherent with the Cogeneration Directive, no distinction between district heating and industrial cogeneration should be made. The only criteria for deciding whether to promote a certain installation should be the question whether the plant allows for high efficient generation.

All other NAPs:

NAPs that neither follow the benchmarking principle nor have established a specific cogeneration sector still allow for the promotion of cogeneration at the installation level. Several Member States have taken this route by taking out (or softening) the sector-specific compliance factors for cogeneration plants. Three principles should be considered:

(1) There should be no compliance factor for cogeneration installations (i.e. compliance factor of 1). By taking this factor out of the allocation formula, all NAPs that are based on the grandfathering principle can be fine-tuned so that investment decisions are directed towards cleaner technologies and processes.

(2) The mechanism described in paragraph (1) should be used exclusively for cogeneration and biomass-fuelled installations. According to the Community guidelines on State aid for environmental protection, only these technologies and processes meet the general conditions for authorising environmental aid. In this context, the definition of cogeneration installations should be in line with Directive 2004/8/EC.

(3) As an alternative to deleting the compliance factor for cogeneration installations, NAPs could include a production-based premium for high efficiency cogeneration electricity. This mechanism has the advantage of fully following the spirit of Directive 2004/8/EC.

In addition, it is important that the number of allowances should not be based on historical emissions per year but rather on historical emissions per power output during the baseline year. Consequently, this last factor should be multiplied with the forecasted power output during the allocation period in order to calculate the number of allowances. Given the variability of power output from cogeneration, this flexibility is necessary for achieving a fair allocation.

These policy recommendations represent a direct output of the study entitled "The Treatment of CHP Plants in the Phase-1 NAPs" that was carried out by COGEN Europe in December 2005.