

CZ-AT Bilateral Winter and Summer School

Emission Trading

The Czech and Austrian Perspective

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Graz, June 2007

Contents

1. Introduction.....	3
2. Comparison of the Austrian and Czech Republic starting positions.....	4
3. EU ETS – Austrian and Czech positions	6
4. Comparing Austrian and Czech Republic National Allocation plans	8
5. Summary	11
Literature	12
Appendix	13

CZ-AT Bilateral Winter and Summer School 2007

1. Introduction

Economic instruments of environmental regulation are recently becoming more widely used in the environmental policy mix in developed countries. One of such economic instruments is trade of emission allowances/permits among economic actors or whole states. The European Union emissions trading scheme (EU ETS) was introduced within the EU-25 in 2005. Under this scheme, each participating country need to develop its National Action Plan (NAP) according to ETS specifying caps on greenhouse gas emissions. It allocates pollution allowances to about 10,500 plants in total volume around 2,100 Mt CO₂. The traded amounts and volumes are growing very rapidly. The EU ETS market had transactions of € 19 billion in 2006 (the value traded tripled compared to 2005) of total volume of 1,101 Mt CO₂ (World Bank, 2007) and created a visible price of CO₂. After two years of functioning we can look at the preliminary results of the system.

The legal basis of emission trading is based on the Directive 2003/87/EC according to which every installation within its scope must have the license for the emission of the greenhouse gases. EU ETS covers energy intensive sectors of industry, foremost heat and power generation, refineries, production of metals, cement, lime and paper. In total, CO₂ emissions included into the EU ETS schemes count for around 50 % of total CO₂ emission emitted in the EU.

The allocation of the emission allowances is divided into two separate periods. Currently we are in the last year of the first phase (2005 – 2007). The first phase was supposed to be the learning phase and we can really learn from the preliminary results. While comparing the allocated allowances and real verified data of the years 2005 and 2006 in both cases we can see that there were allocated more than the whole system needed.¹ The national allocation plans (NAPs) of the second period (2008 – 2012) are being reviewed by the European Commission (EC). At present EC has reviewed 21 NAPs. In almost all cases (apart from the UK and Slovenia) the EC ruled to cut significantly the annual allocation of allowances to make the system more binding. In general we can speak about 9 - 10% cuts of suggested NAPs.

This paper focuses on the common features and differences between the EU ETS system implemented in Austria and Czech Republic and the interpretation of the

¹ According to EC and CITL in 2005 and 2006 there were allocated around 2,196 Mt CO₂, however, there were emitted only about 1,988 Mt CO₂ and 2,010 Mt respectively.

CZ-AT Bilateral Winter and Summer School 2007

observed position. We compared the national allocation plans of both countries and we focused on the allocation methodologies and sector division. We tried to stress just the most important characteristics without going much into detail as the space dedicated to this paper is very limited.

2. Comparison of the Austrian and Czech Republic starting positions

Austria and the Czech Republic have very different starting positions in the European Emission trading scheme (different industrial production portfolio, different energy mix and finally also different legally binding obligation included in the Kyoto Protocol).

Table 1 shades some light on the most important differences.

Table 1: Basic facts related to CO₂ Emission Situation of AT an CZ		
	Austria	Czech rep.
Annual CO ₂ e emission (Mt) of 2004	91.148	165.6
Annual CO ₂ e emission (Mt) of 1990 – Kyoto base year	78.53	196.3
Kyoto target	- 13% of 1990	- 8% of 1990
Energy Intensity (kgoe / €1000)	146.08	851.83
CO ₂ Emission intensity (kg CO ₂ /GDP 2000 US \$ (PPP)	0.31	0.71
CO ₂ Emission intensity per capita (t CO ₂)	7,8	11,2
Share of Greenhouse gases (GHGs) emissions by source sectors (MT CO ₂ e) on national GHG emissions		
Agriculture	6%	5%
Industrial Processes	10%	7%
Energy	61%	78%
Transport	20%	9%
Waste	3%	2%

Source: Lovíšková (2007), IEA , EC , Eurostat , own calculation according to AT and CZE NAPs 1

Thanks to its natural endowment, Austria belongs to the greatest producers of energy from renewable resources (according to EC (2007) about 62% of domestic electricity mix). Its energy production is dominated by hydroelectricity and smaller amounts of

CZ-AT Bilateral Winter and Summer School 2007

other renewables mainly biomass. However, this “clean” production is not able to cover the whole domestic demand, Austria is a net importer of electricity as it is not able to cover its own electricity consumption by own production. Its economy belongs to those least intensive ones among EU-27 (2nd lowest intensity).

On the other hand, the Czech Republic has one of the lowest energy import dependencies in the EU-27, thanks to its large contribution of domestically produced solid fuels and nuclear energy to its energy mix. The Czech Republic governs in comparison of high levels of energy and CO₂ emission intensities. The share of solid fuels in electricity generation is 59% (mainly based on lignite power plants) and it almost doubles the value of the EU-27 average (30%). Nuclear power also contributes significantly to electricity generation (31%) with growing share through six nuclear reactors (EC, 2007).

When we look on the sector contribution on the GHG production it underlines the above description of national energy mix of Austria and the Czech Republic. In both countries the energy sector is major producer of GHGs; however, it is significantly greater in the Czech Republic.

Both Austria and the Czech Republic belong to the Annex 1 countries of the Kyoto protocol² obliging the reductions of greenhouse gases (GHGs) within the period 2008 – 2012.³ Austria committed itself to reduce its emissions by 13 %, or to 68.69 million tons CO₂ – equivalents⁴. As mentioned above, Austria is already one of the least carbon intensive economies. Is there a potential to reach the Kyoto target? According to the EC projections (EC, 2006), with existing policies and measures Austria would be about 14% above the level of the based year in 2010 (i.e. Not -13 % as it should be...). This position can be improved by using Flexible Kyoto mechanisms and other measures to reach position of -6.5% of the base year (however it is still above the target...).

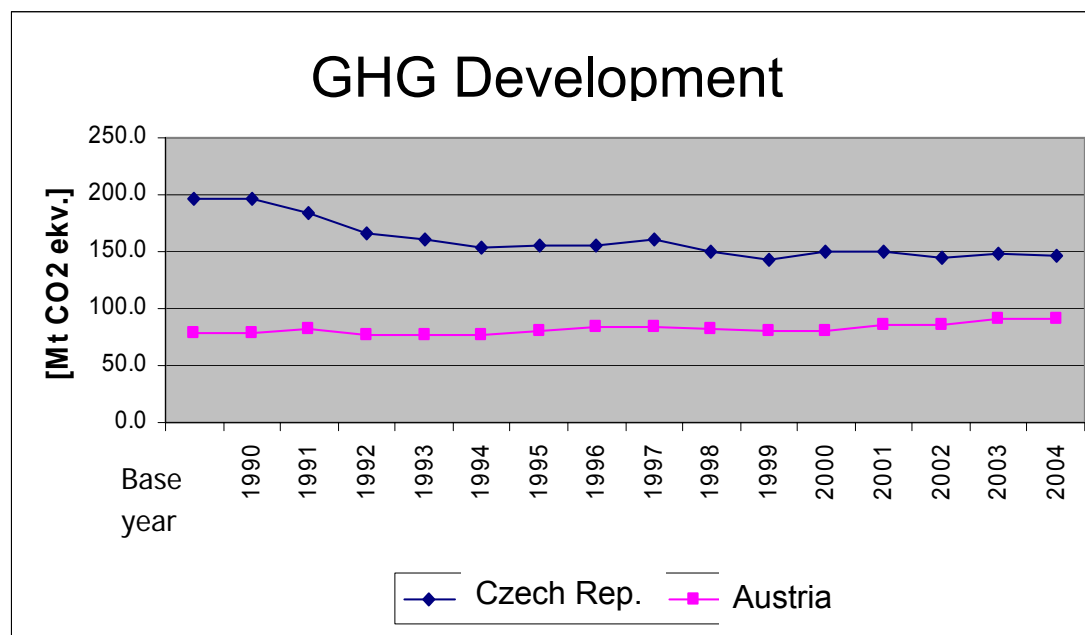
² Austria ratified the Kyoto Protocol jointly with the EU on May 30, 2002, the Czech Republic in 2001.

³ The Kyoto period run in the same time as the second allocation period of EU ETS. The “cooperation” of those two systems is described by the Linking Directive (2004/10/ES), that creates linkage between the EU ETS and the Kyoto flexible mechanisms (JI/CDM projects). It also ensures the equivalency of allowances allocated within the EU ETS scheme (so-called EUAs) and those of Kyoto protocol (AAUs).

⁴ In absolute figures reduction by 10.27 million tons

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Figure 1: Comparison of GHG development in Austria and the Czech Republic



Source: Lovíšková (2007)

Completely different position is with the fulfilment of Kyoto target in the Czech Republic. The Kyoto commitment was set on reduction of 8% of 1990-GHG emission levels. As it is shown on the *Figure 1* the GHG emission has been decreasing since the base year 1990 and it is significantly below the Kyoto target. Such a positive situation was not reached by any major climate change policy but by deep structural changes of the economy during the post-communist era (mainly thanks to the closing of many energy (i.e. emission) intensive industrial companies. It gives great opportunity to the Czech Republic to profit from such situation – however – from the environmental protection point of view it creates negative signal to change significant emission intensity of the Czech economy.

3. EU ETS – Austrian and Czech positions

When we tried to compare the position of Austria and the Czech Republic we should have in mind the different Kyoto obligations described above. The Czech republic belongs still to the transition countries that are supposed to grow therefore its allocation is in both periods computed above the current level of verified emission, whereas Austria has its drastically binding Kyoto obligation of 20% of current level of emissions. This creates different “playing fields” for both countries within the EU ETS.

CZ-AT Bilateral Winter and Summer School 2007

Table 2 summarises the current situation of allocation and real emissions in the first 2 years of EU ETS whereas Austrian verified emissions are around the real target, the Czech situation shows the great surplus of the allowances. In the second trading period the Austrian cap is set below the current levels of emissions which will be really ambitious target to meet.

Table 2: EU ETS Allocation related to AT and CZ

	Austria	Czech Republic
Allocation p.a. NAP1 (MtCO ₂)	32.675	97.10
Verified emission 2005 / 2006 (Mt CO ₂)	33.4 / 32.4	82.4 / 83.5
Proposed Allocation p.a. NAP2 (Mt CO ₂)	32.8	101.9
Allocation p.a. NAP2 (MtCO ₂) approved by EC (cuts compared to proposed NAP2)	30.7 (- 6%)	86.8 (-15%)

Source: own calculation according to NAP 1 of Austria and the Czech rep, EC (2007), Lovíšková (2007)

We can compare the situation of Austria and the Czech Republic with other EU countries in *Figure 2*. The countries with red columns are those with excessive allocation. Red columns stands for the share of emission that was lower than the allocation whereas countries with blue columns are those in short position, i.e. those

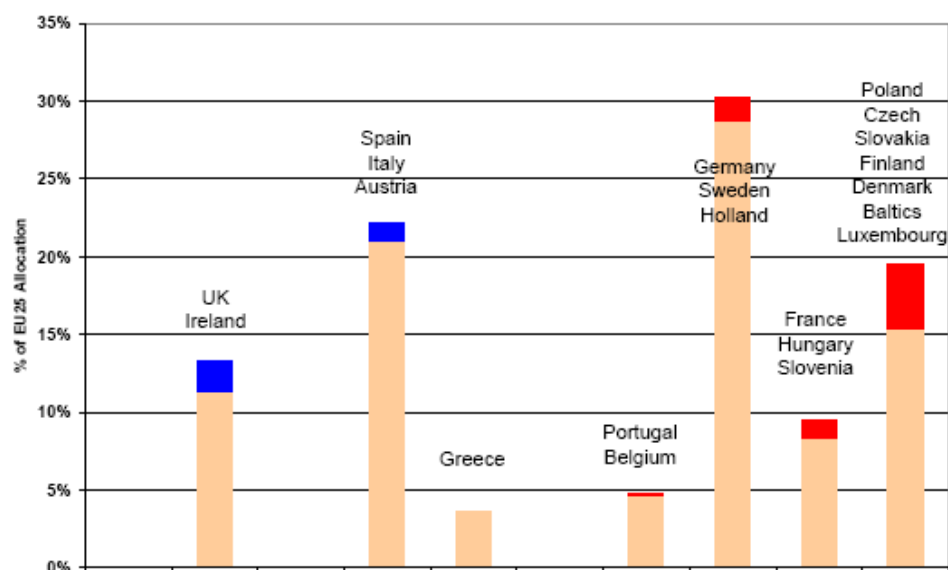


Figure 2: Comparison of verified data and annual allocation

Source: Ellerman, Buchner, (2006)

CZ-AT Bilateral Winter and Summer School 2007

who emitted more than their annual allocation. The majority of countries were in the long position, i.e. they had excessive amount of allowances.

4. Comparing Austrian and Czech Republic National Allocation plans

In our comparison we focus on the two aspects of the national allocation plans in these two countries: on the allocation methodology and the sector division of the system. At the moment we can compare both the NAP for the first trading period and the proposals of the second trading period. EC ruled the decision on the allocation in Austria and the Czech Republic for the second period this spring⁵ and in both cases the National allocation plans were obliged to cut the total allocation of allowances. At the moment the second allocation plans are being reviewed by the national governments because they have to implement the changes in line with the decision of EC. The latest information is that the Czech Ministry of Environment submitted a new version of allocation plan with different allocation methodology on May 31, 2007. Apart from that the Czech Republic also sues EC over the allocation decision⁶.

We begin by observing the first allocation period. The similar characteristic of the both allocation plans is the division to the installation through the sector level. In the Czech allocation plan, there were 12 sectors totally covering 395 installations whereas the Austrian plan divided sector into two major groups: energy and industry, those two groups were together divided into 17 sectors with 203 installations.

We tried to compare the major similar sectors and their division in **Table 3**. In the Czech Republic the largest amount of allocation went to the sectors of energy and heating mainly due to the characteristics of energy production (coal-fired majority of power plants). The greatest receiver among all the companies was the energy company ČEZ that received almost one third of all allocation. On the other hand the major receiver of allocation in Austria was internationally important steel company Voestalpine (about 25%) that also belonged to the steel sector with the most generous allocation.

⁵ Ec decided on AT NAP on April 2, 2007 with cut about 6% and on CZ NAP March 26, 2007 with cut about 15%

⁶ The Czech Republic is one of the 4 countries that started legal action against EC decision together with Poland, Slovakia and Hungary

CZ-AT Bilateral Winter and Summer School 2007

Table 3: EU ETS – (NAP 1) sector allocation –major sectors

	Austria	Czech republic
Energy and heating	28.7%	65%
Steel	34.21%	15.9%
Cement	7.8%	3.1%
Paper	7.17%	1%
Refinery	8.3%	1.4%
Chemical production	3.27%	5.7%

Source: own calculation according to NAP1 AT and CZ

The total amount of allocation in the Czech Republic was computed as a combination of historical emission (years 1999 – 2001) with growth projection to individual sectors (the highest growth projection was appointed to refinery with growth coefficient 1.57, the lowest growth coefficient was appointed to sector of Pulp and Paper with growth coefficient 0.98).

On the other hand, in the Austrian allocation methodology those growth coefficients were replaced by reduction potentials of individual sectors. The climate strategy (agreed in 2002) set out the politically fixed reduction contributions vis-à-vis trend. Under national climate strategy each sector is assigned a precise reduction potential. The number of allowances allocated is calculated by taking the sum of business-as-usual values of all sub-sectors within a sector and subtracting the climate protection contribution of the sector.

Discussion over the second allocation plan can be just preliminary as both allocation plans has to be modified according to the EC decision. At the moment we can compare the latest Czech version that has already incorporated the changes with the Austrian version submitted to the EC but without final changes, however, as the final cuts of Austrian allocation plan will not be so significant, we may presume that the methodology will not change.

Looking at the methodology of the second allocation plans we see that the national allocation plan Austria follow the similar principle as in the first period. It has only modified the parameters of the sector and sub sector allocation. According to the plan, climate protection contributions of the EU ETS sectors will ensure that the Kyoto target is met.

CZ-AT Bilateral Winter and Summer School 2007

Table 4: Proposed Reduction compared to Business as Usual

Energy	-23,9%
Electricity generation sector	-29,8%
District heating sector	-6,1%
Mineral oil processing sector	-6,0%
Industry:	-6,0%
Integrated steelwork sector	-8,9%
Other industries sector	-4,8%
<hr/>	
Total	-14,0%

Source: Austrian National Action Plan2

http://www.iea.org/Textbase/publications/free_new_Desc.asp?PUBS_ID=1859

The allocation methodology on the installation level was changed in the sector of electricity where there was chosen a benchmarking approach. This approach provides for the use of different benchmarks - expressed in tons of CO₂/GWh - for net electricity and net heat generation in installations of the electricity generation sector. The allocation method of benchmarking was already used for several sectors in several allocation plans in the first period (e.g. The Netherlands, Denmark, Great Britain) On the electricity side, the benchmark was set at 350 t CO₂/GWh, on the at heat side 175 tCO₂/GWh (oriented at the use of natural gas).The potential factor for each installation expresses the difference between historic emission values (2002-2005) and the emission values based on the benchmarks. Upper and lower limits are defined for the potential factor (0.65/1.05) (AT NAP 2)

Methodology of the Czech second allocation plan has to be changed significantly as the EC mandated 15% cut of total allocation. Ministry of environment submitted a new version where there is no more valid the division into the sectors, instead of this there is applied a single structure of two groups divided according to their emitted amount of emissions: bellow 50 tCO₂ p.a. and above. There is again applied the different growth factors to compute final allocation. The growth factors are set to favour smaller installation in the sector (growth factor for the smaller installations permits 8% growth of emissions whereas growth factor for large installation permits only 1,73%.

5. Summary

Both the Czech Republic and Austria have different starting position in the European Emission trading scheme (different industrial production portfolio, different energy mix and finally also different legally binding obligation included in the Kyoto Protocol). Austria is country with one of the lowest CO₂ emission intensity among the EU 27 countries whereas the Czech Republic is the opposite. Austrian share of renewable energy is also one of the highest within the EU whereas the Czech Republic has one of the highest share of energy made of solid fuels.

Seen it from this perspective we would expect that the Czech Republic will have much binding target of emission reduction however the opposite is true. Because the Kyoto targets are computed according to the base year 1990 for the Czech Republic and Austria it gives milder constraint to the Czech Republic than to Austria. The Czech republic belongs still to the transition countries that are supposed to grow therefore its allocation within the EU ETS is in both periods computed above the current level of verified emission, whereas Austria has its drastically binding Kyoto obligation of 20% of current level of emissions therefore its allocation is close to its current level of emission and in the future it will go even below the current emissions.

The majority of allowances in the Czech Republic is allocated to the sector of power and heating (65%) whereas in Austria the largest receiver of allowances is the steel sector.

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Appendix

Cap and Trade: A system involving trading of emission allowances, where the total allowance is strictly limited or 'capped'. A regulatory authority established the cap which is usually considerably lower (50% to 85%) than the historic level of emissions. Allowances are created to account for the total allowed emissions (an allowance is a unit of measurement referred to as AAU). Trading occurs when an entity has excess allowances, either through actions taken or improvements made, and sells them to an entity requiring allowances because of growth in emissions or an inability to make cost-effective reductions. Cap and Trade programmes are closed systems, but can be modified to allow the creations of new permits by non-capped sources in the manner of credit-based systems

Clean Development Mechanism (CDM): A mechanism established by Article 12 of the Kyoto Protocol for project-based emission reduction activities in developing countries. The CDM is designed to meet two main objectives: to address the sustainable development needs of the host country, and to increase the opportunities available to Parties to meet their reduction commitments.

Community Independent Transaction Log: The transaction log which will be established under the EU Emissions Trading Scheme, through which all Transactions will be communicated and recorded, checked, and completed or rejected as appropriate.

Economies in transition (EITs): As defined by the Annex I Expert Group on the UNFCCC, EITs are countries which are undergoing the process of transition to a Market Economy: Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation , Slovak Republic, Slovenia, Ukraine

Flexibility Mechanisms: The Kyoto Protocol has provisions that allow for flexibility in how, where, and when emissions reductions are made via three mechanisms: the Clean Development Mechanism, International Emission Trading and Joint

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Implementation. These mechanisms have been established to increase flexibility and hence reduce the costs of reducing emissions.

Joint Implementation (JI): A project-based mechanism developed under the Kyoto Protocol (KP), designed to assist Annex 1 countries in meeting their emission reduction targets through joint projects with other Annex 1 countries, meaning that JI projects can only be implemented between capped industrialised countries. One or more investors (Governments, companies, funds etc) will agree with partners in a host country to participate in project activities which generate Emission Reduction Units (ERUs), in order to use them for compliance with targets under the Kyoto Protocol.

Emissions from the host country are limited under the Kyoto Protocol; JI projects reduce emissions in the host country and free up part of their total amount (Assigned Amount) which can then be transferred to the investor country in the form of ERUs, which are subtracted from the host country's allowed emissions and are added to the total allowable emissions of the investor country. ERUs can only be used for compliance from 2008, even in the EU ETS.

Kyoto Commitment Period (or Compliance Period): The period specified in the Kyoto Protocol from 2008 to 2012 in which Annex B countries have committed to reduce their collective emissions of greenhouse gases by an average of 5.2%. There are currently no emissions targets after the commitment period. These targets, if the United Nations Framework Convention on Climate Change (UNFCCC or the Convention) process continues in its present form, will be negotiated closer to the expiration of the first commitment period. It is expected that the current model of five-year periods of commitment will be maintained. Major questions regarding future commitment periods include the level of allowed emissions among capped (Annex I) countries and the extent to which additional countries take on caps (that is, developing country participation).

Kyoto Protocol: The Kyoto Protocol originated at the 3rd COP to the United Nations Convention on Climate Change held in Kyoto, Japan in December 1997. It specifies

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the level of emission reductions, the deadlines and methodologies that signatory countries (i.e. countries who have signed the Kyoto Protocol) are to achieve.

The Kyoto Protocol specifies the deadlines and specific levels of greenhouse gas reductions that signatory countries are to achieve. Overall, developed countries are to reduce greenhouse gas emissions by 5.2% between 2008 and 2012 as measured against 1990 emission levels.

Annex B Countries: Emissions-capped industrialised countries and economies in transition listed in Annex B of the Kyoto Protocol. Legally-binding emission reduction obligations for Annex B countries range from an 8% decrease (e.g., various European nations) to a 10% increase (Iceland) in relation to 1990 levels during the first commitment period from 2008 to 2012.

Annex I Countries: 36 industrialised countries and economies in transition listed in Annex I of the United Nations Framework Convention on Climate Change (UNFCCC or the Convention). Their responsibilities under the Convention are various, and include a non-binding commitment to reducing their greenhouse gas emissions to 1990 levels by the year 2000. Note that Belarussia and Turkey are listed in Annex I but not Annex B; and that Croatia, Liechtenstein, Monaco and Slovenia are listed in Annex B but not Annex I. In practice, Annex I of the Convention and Annex B of the Kyoto Protocol are used almost interchangeably. However, strictly speaking, it is the Annex I countries which can invest in Joint Implementation (JI) / Clean Development Mechanism (CDM) projects as well as host JI projects, and non-Annex I countries which can host CDM projects. This is true, despite the fact that it is the Annex B countries which have the emission reduction obligations under the Kyoto Protocol.

Annex II Countries: Annex II of the United Nations Framework Convention on Climate Change (UNFCCC or the Convention) includes all original OECD member countries plus the European Union. Under Article 4.2 (g) these countries have a special obligation to help developing countries with financial and technological resources.