

THE ROLE OF THE ECONOMIC INSTRUMENTS IN ENVIRONMENTAL MANAGEMENT IN GERMANY

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Abstract

Financial and economic instruments for reducing CO2 emissions is the most effective means of prevention and control of pollution is certainly superior command and control measures used in complementary. Environmental policy instruments used in Germany have made improvements locally, regionally and nationally. The problem is that we need to find new ways to apply these tools to ensure a healthy long term. How Germany managed so far to reduce the greenhouse gas emissions by up to 20%, is a good example to follow, so Romania to improve implementation of environmental policy at local, regional and national level.

Key words: *economic instruments, prevention of pollution, CO2 emissions*

JEL classification: Q53, Q58

1.INTRODUCTION

The main objectives of the Kyoto Protocol until 2020 for Germany are the reduction of the hothouse gasses emissions by up to 40%, in comparison to the year 1990. Germany in the EU -15 distributions in the Kyoto Protocol for hothouse gas reduction of 21% in the period 1990-2008. The following measures can be successful, in order to offer the rest of 19% until 2020.

The energy generation and use are contributing to the climate protection. The Environmental Federal Agency has identified eight measures in the electric power, heat and transport, with the goal of reaching this objective until 2020 (Table 1). The development of the energy renewable sources should base themselves on these pillars, in order to reduce emissions. The share of the technical and systemically measures in the global scenario for the reduction of CO2 emissions is based on economic efficiency criteria (the lowest cost possible to reduce emissions per Co2 ton), the elimination of the juridical and administrative barriers in the way of emissions reduction and the putting into application of the necessary behavior changes.

Activity fields	1990	2005	2020
trade / services	87	53	43
households	129	113	74
transport	162	164	134
industry	154	103	73
energy	415	362	247

Table 1: Evolution of the CO2 emissions

Source: Umweltbundesamt (Ministry of Environment)

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The energy savings, the avoiding of the useless traffic and the greater use of the renewable energies can diminish not only the CO₂ emissions, but also the atmosphere pollutants, as the sulphur dioxide, the particles emissions, the nitrogen oxides and the volatile organic components. By the reduction of the atmosphere pollutants, according to a report issued by the UBA (Umweltbundesamt), the health expenses in Europe (EU-27) could have an average of 12 Euro.

In the graph above (Figure1), we can see the evolution of the CO₂ emissions coming from different activity sectors in the period 1992-2011. The greatest share is held by energy sector, around 50% of the emissions.

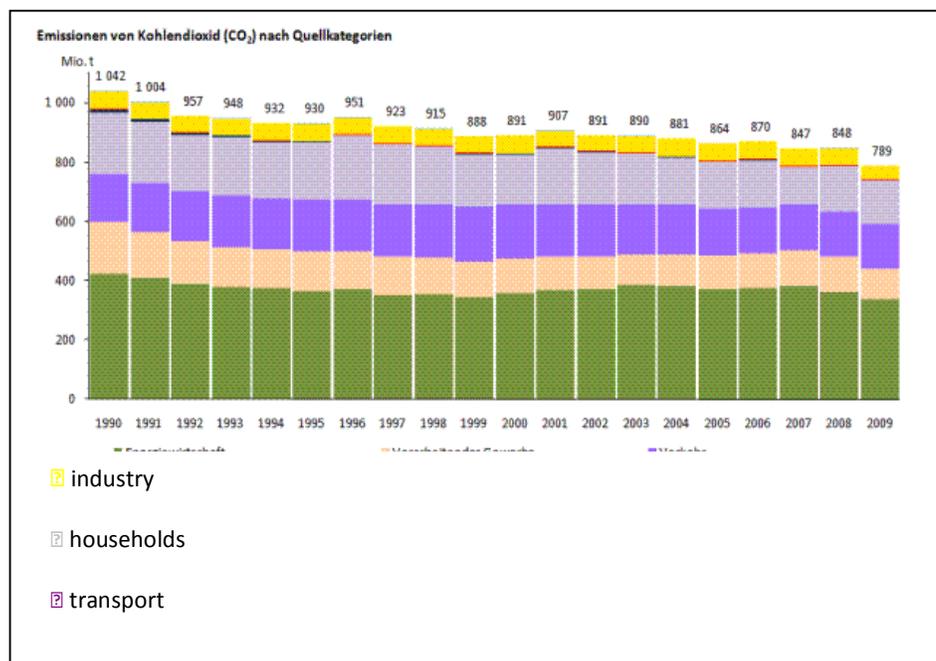


Figure 1: CO₂ emissions - Activity fields
 Source: Umweltbundesamt (Ministry of Environment)

During the analyzed period, the emissions value decreased by use of some well defined economic instruments, through the efforts made by the Environmental Federal Government. A method for the reduction of these emissions coming from this sector is the use of the renewable energy, which means higher costs, but also could create ecological security on long term.

Another field acknowledged as a source of gas emissions with hothouse effect is the transport sector, which holds a share of 20% of the emissions coming from the fossil fuels consumption. The German Government has established taxes and charges to reduce the emissions, but this will lead to the increase of the diesel oil price.

2.THE ECONOMIC INSTRUMENTS APPLIED FOR THE REDUCTION OF THE CO₂ EMISSIONS

The economic instruments represent the most important means through which the Federal Government in collaboration with other levels of the Government, as the European Union can determine the change of the quantity of the hothouse effect gas emissions. The instruments are characterized by a relatively high productivity, in terms of the reduction of realizable

emissions for the climate protection they are especially important (the efficacy criterion). Second, the instruments have a high efficiency, which means that they have relatively reduced costs from economic point of view (the costs for avoiding the emissions and the transaction costs) which lead to the reaching the objective of the emissions reduction (the efficiency criterion). Third, the proposal for usual instruments is advantageous, for example, because they have a relatively non problem execution, a relative high acceptance socially or they have a stimulating effect upon the innovations in regard the climate changes.

In order to reach the objective of 40% reduction of the CO₂ emissions there will be necessary a juridical planning and regulation of the economic instruments and also an information base. In this context, UBA suggests that an instrument which could be applied is the energy taxation. It is oftenly methodological, difficult to quantify the primary energy prices development. In order to reach the improvements of commutation and efficiency fuels, the selling of the emission quotas is the economic instrument which could be used in Germany and has as effect the application of the reduction of CO₂ emissions until 2020. In the goal of realizing, as proposed in the UBA scenario, for the majority of emission reductions in the energy and industry sectors, Germany must reduce the budget of emissions quotas between 330-350 million Euros/ year until 2020. In the national plan, for the period 2008-2012 it is established a reduction by 32 millions of tons CO₂, in comparison to the year 2005, which means a smaller quantity for what is necessary.

The choice for the instruments depends on the present stage of Germany's economy, there are taken into consideration the historical and political conditions. In order to reach the objective proposed, to reduce the emissions by 40%, Germany needs regulations of the economic instruments and a very good information base. Some of the instruments are completing reciprocally and over pose themselves according to the activity sectors. From this reason, the reduction of CO₂ emissions can be the result of the action of a single economic instrument. The development of the primary energy price can lead to the reduction of CO₂ emissions, as effect of the use of this instrument. It is necessary that, annually, Germany should reduce by 571 million tons of CO₂ until the end of the year 2020, such as 2005 the reduction was of 224 million tons of CO₂. In different economic sectors in Germany, there are available for the reduction of the hot house effect gas emissions different action possibilities. As result, there is no proportional allocation of these necessary reductions in the energy, industry, transport and agriculture fields. In exchange, UBA is based on the distribution of reduction objectives on the following criteria:

- The reduction of the existent potential costs, that is the smallest possible costs for avoiding per ton of CO₂;
- Avoiding the obstacles in view of emissions reduction;
- The putting into application of the necessary changes in behavior.
- Within this context, UBA issued a prognosis until 2020, detailed in the following (Table 2):

Million tons of CO₂	2002	2010	2020	Reduction between 2002-2020	Reduction between 2002-2020 (%)
Energy	357	342	335	-22	-6%
Industry	132	126	118	-14	-11%
Transport	176	171	155	-21	-12%
Households	176	178	158	-18	-10%

Table 2: The prognosis of the CO₂ emissions

Source: Umweltbundesamt, 2011

The annual costs, in comparison to the reference scenario are between 1.7 billion euros in 2010 and of 11.2 billion euros in 2020. UBA has elaborated a scenario for the reduction of the

gas emissions with hothouse effects in the energy sector. In the industry and in households, though, half of the reductions of emissions identified in IKARUS in value of 27 million tons of CO₂ and 39 millions of CO₂ will be put into application in the reference scenario. UBA considers that this potential is fully accomplished. In the transports sector, the pattern is calculated for the reduction by 25 million tons of CO₂ including behavior modifications, as it is the replacement of going by the own car instead of the use of common transport means, or going by train. An attenuation potential leaves from 35 million tons of CO₂. The potential and the trends in the trade sector and services differs considerably. Here appear the barriers- as the lack of informative as regards the energy economies, UBA considers that the pattern from IKARUS calculated for the potential of emission reduction in value 20 million tons of CO₂ is given only by 12 million tons CO₂ which will be exhausted. The result of these considerations is resumed in the table below (Table 3).

Million tons of CO ₂	real values		IKARUS		UBA scenario	
	2005	2011	absolute reduction 2005-2020	CO ₂ emissions	absolute percentage	absolute reduction 2005-2020
energy	362	285	-142	247	-41%	-115
industry	103	95	-27	73	-53%	-30
transport	164	144	-22	134	-17%	-30
households	113	100	-99	74	-43%	-39
GHD	53	38	-18	43	50%	-10

Table 3: Emissions pattern IKARUS- UBA; Measures to reduce the energy costs
Source: Umweltbundesamt/ Treibhausgas

3.MEASURES TO REDUCE ENERGY COSTS

Until 2020, the energy industry in Germany will realize a reduction of CO₂ emissions of 115 million tons, comparatively to 2005. This section is focused upon the measures necessary in generating electric power, as the accounts for power generation are approximately 80% of the CO₂ emissions in the energy industry.

The building of new power stations with natural gases, a supplementation of 133 TWh of electric power, which is associated with plants in function, 49 million tons of CO₂ emissions, could lead to the development of the renewable energy development for 77 TWh of the direct emissions of CO₂.

The budget of the emissions quotas must be at the intersection of the selling period between 2008-2012, and in the period 2013-2017 it will be much more reduced than in the transition period 2005-2012. The selling of emissions for the energy and industry sectors is an important economic instrument in order to apply the emissions reduction necessary until 2020. This instrument has as an effect the avoiding of the CO₂ emissions, in case the reduction costs are the smallest. The highest fixed limit of the emissions quotas will ensure that the objective to reduce the emissions is realized in all cases and the rights for the emission certificates will be negotiated. The allocation of reductions for the CO₂ emissions in the UBA scenario for the period 2012-2020 means a budget for the emissions quotas reduction of 330-350 million euro/year.

In the periods 2013-2017 and 2018-2022 it will take place a uniform commercial reduction by 48-55 million tons of CO₂. In the Allocation National for the selling period 2008-2009 a reduction by 32 million tons of CO₂ took place, in comparison to the real values of the year 2005.

Thus, the planned reduction of the budget for the last two periods is bigger than in the first periods. The reduction of the selling of emissions budget to 453 de million tons of CO₂ /year is a step on the way to the objective of 40% reduction. With all this, the reduction objective will registrant an even higher percentage in the transition period from the second advancement until the third and fourth selling period. The necessary efforts at national level will continue in the area of the mission to sell the emissions, through measures at least as exigent as these.

The Renewable Energy Sources Law (EEG) establishes the taxes for technical variations (size, location). The choice for the compensation and time duration amount (usually, 20years) is in the form in which the costs for electric power production are covered and the system operator can generate a profit enough for the investments. Under the reserve of reimbursing the remuneration rates for each of the installations newly installed until the annual progression, such that there are economic incentives to reduce the costs from the technical progress realized. This reduction is, for example, in the wind energy of 2% of year, and at PV of 5% of year.

4. CONCLUSION

The Renewable Energy Sources Law (EEG) has significantly contributed to the development of the wind energy, solar energy, often mentioned as renewable energy. This field attracted, in Germany, in the year 2008 around 300.000 jobs in the renewable energy industry.

In Germany, especially the wind energy and photo voltaic energy are on top positions in the export. The potential for innovation of the renewable energies was not sufficiently promoted, until present days, so that the dynamic support efficiency, could decrease, and this way, the trend to increase the cost could have had an ascendant tendency.

The taxation of the activities with an impact upon environment is part of the larger class of the Market Based Instruments (IBP) and represents one of the strongest instruments of changing the pattern of resource use of any state.

5. BIBLIOGRAFIE

- Bădileanu, M. *Economia protecției mediului înconjurător*, Editura ASE, București, 2007
- Christoph Erdmenger, Harry Lehmann, Klaus Müschen, Jens Tambke, *Klimaschutz in Deutschland: 40%-Senkung der CO₂-Emissionen bis 2020 gegenüber 1990*
- Dăduianu, I. *Protecția mediului înconjurător*, Centrul de Informare și Documentare Economică, 1994
- Krey, M., Weinreich, S. *Internalisierung externer Klimakosten im Pkw-Verkehr in Deutschland*, Documentation Nr 00-11, 2007
- Lehmann, S. *Das Kyoto Protokoll: Eine ökonomische Analyse unter besonderer Berücksichtigung der flexiblen Mechanismen*, 2010
- Negrei, C. *Economia mediului*, Editura Economică, București, 2002
- Negrei, C. *Instrumente și metode în managementul mediului*, Editura Economică, București, 1999
- Piciu, G. (coordonator) *Riscurile ecologice și costurile politicilor de mediu din perspective dezvoltării durabile*, proiect de cercetare din CCFM „Victor Slăvescu”, 2012
- Piciu, G. (coordonator) *Evaluarea riscurilor finanțării proiectelor de investiții orientate spre protecția mediului*, proiect de cercetare din CCFM „Victor Slăvescu”, 2011
- Umweltbundesamt, *Daten zur Umwelt ausgabe 2011* Umwelt und Landwirtschaft.