A Process Oriented Analysis of The "Declaration of German Industry on Global Warming Prevention" and Its Implications for The Role of Voluntary Approaches in Post-Kyoto Climate Policy

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ABSTRACT

Challenged by industry's growing claim for higher self-responsibility and more flexibility, energy and climate policy-makers need to define a future role of voluntary approaches (VA) which realises the benefits but guarantees environmental effectiveness and political efficiency of these initiatives. Taking the 1996 "Declaration of German industry on global warming prevention (DGWP)" as an example of an energy related VA, the paper pursues a dual approach for policy analysis in order to evaluate the static performance and the dynamic process features of the DGWP approach. Transferred to a dynamic model of co-evolutionary climate policy-making, the general conclusions of the German case for climate policy are discussed.

Introduction: Post-Kyoto Climate Policies - What is The Challenge?

For the first time in the history of global climate policy, in December 1997 the participants of COP3 in Kyoto agreed on an internationally binding frame for common CO_2-abatement strategies. Although representing a political breakthrough, post-Kyoto climate policies should not be limited to short-sighted efforts to achieve the targets of the protocol but should strive for more comprehensive and far-reaching contributions to global warming prevention:

- The emission targets laid down in the protocol represent a promising first, but insufficient, step to fight climate change. According to the IPCC, much more still has to be done, i.e. on global average a reduction of greenhouse gas (GHG) emissions by 50% until the year 2050 compared to 1990 levels is needed.
- GHG emissions are not problems in and of themselves but result to a large extent from an unsustainable use of fossil energy resources - aggravating the manyfold ecological burden connected to the fossil energy system as the carbon backbone of industrialised countries (Hohmeyer & Ottinger 1992). Therefore, deliberate policy action has to stimulate the introduction of new energy technologies as well as fundamental paradigm changes of common patterns of fossil resource use and material flows in the sense of a decarbonization of western societies (Sachs, Loske & Linz 1998).

Significant policy efforts will be necessary to integrate these requirements in policy and business action, because autonomous technical progress and economic developments in the business-as-usual case will hardly provide sufficient impulses to change course (Capros 1998; Nakicenovic et al. 1998). Corresponding to the superior global challenge of a long-term transformation of sustainable energy systems, a multi-dimensional approach is needed which includes strategies and measures to achieve

- a reduction of energy and material flows by a dramatic increase in resource productivity,
- a decreasing demand for energy services by change of life styles and production patterns (sufficiency)
- a boost of generation from renewable energy sources, and
- a prevention of energy-related risks menacing the integrity of nature and human beings.

This perspective of sustainability expands the focus of the traditional climate policy discussion which tends to concentrate exclusively on reducing GHG emission levels. In the broader context, post-Kyoto climate policies not only gain importance as initial means for a significant increase of energy and resource efficiency during the next decades to come - they should serve as well as the stimulus for self-dynamic structural changes towards sustainable

energy and production systems. Accordingly, we suggest a shift of priority of the scientific discussion: whereas the traditional policy debate tends to stick to rather theoretical considerations of principles and (short-term) results of abatement schemes, in this paper we intent to put more emphasis on long-term dynamic aspects. Taking the complex interrelations and interdependencies of dynamic economic and social systems into account, there won't be any easy "golden way" - energy and climate policy will hardly be able to achieve success by employing a single instrument which is easy to implement. By the contrary, unavoidably sub-optimal solutions, new insights and changing frame-conditions will impose the need of a permanent search for better solutions and new opportunities. In our view, climate and energy policy strategies have thus to be understood as **continuous search processes for designing, revising and modifying policy mixes and measures.**

The implication for policy analysis is straightforward: no instrument can be judged to be good or bad *per se* by its theoretical foundation. It has to be carefully assessed with regard to its actual performance within a given real implementation context, and with regard to its inherent flexibility and development capacity concerning the dynamic search and adaptation process. Transferred to this paper's topic of energy related voluntary approaches (VA), two principal target dimensions evolve as the central point of reference for the analysis of voluntary climate policy instruments in industry:

- What are the strengths and flaws of the instrument with regard to its current implementation practice and the administrative and political context of self-responsibile activity in industry (static peformance perspective)?
- What are the opportunities, built-in driving forces and probabilities for continuous evaluation, improvement and development of policy-making by voluntary initiatives, and are they likely to stimulate and accelerate changes towards sustainable industrial production and energy systems (dynamic process perspective)?

In the paper, this perspective of policy analysis will be applied to the "Declaration of German Industry on Global Warming Prevention (DGWP)" as a prominent example of sectoral climate protection agreements in Europe. Although the current implementation process of the DGWP is stalleded due to the recent shift of governmental power in September 1998, the German case study provides fruitful experiences which are of high value for the post-Kyoto climate policy discussions in general.

The "Declaration of the German Industry on Global Warming Prevention" (DGWP)

First discussions on energy related VA took place in November 1991, when industry launched a first energy related declaration as a reaction to the EU Commission's proposal for an energy and CO_2 tax. In July 1992, a more concrete proposal on the operationalisation of the initiative was submitted by industry, but they failed to reach consensus with the government at that time (summer 1993). The situation changed suddenly, when a few weeks before the first conference of the parties (COP1) to the UN-FCCC in Berlin in March 1995, German government - obviously triggered by an urgent need to present national activities to the international audience - launched a new initiative. Due to the fact that the first version of the DGWP (BDI 1995) needed to be published within the official frame of the COP1, the preparation and negotiation phase was characterized by extreme time pressure, and some sector associations had only few days of internal consultation to submit their contribution. Even when taking the 1991-93 discussions into account, it is evident that the instrument was extremely hastily set up without any comprehensive preparation or analysis. Not surprising, the first version incorporated a multitude of drawbacks, deficiencies and open questions, which received strong criticism.[1] Partially, they were taken into account during the industry-government talks

[1] For comments on the first version see Wuppertal Institut 1995; DIW 1995; Clausen & Zundel 1995.

when the updated version of the DGWP was shaped. This was published one year later in March 1996 (BDI 1996a). From there on, no further corrections were made.

The DGWP is published by 14 industrial associations mainly from the basic industries (represented by the Federation of German Industries BDI), the association of the industrial power generators (VIK) and four associations from the energy sector including the two major electric utility associations (VDEW and VKU). The updated DGWP represents some 70% of industrial energy consumption and almost all public electricity generation. However, considerable parts of industry with increasing economic importance such as investment, consumer goods, and food industry (except sugar) are missing. By this umbrella declaration, industry declares its willingness to undertake extraordinary efforts on a voluntary basis in order to achieve a reduction of 20% of the total industry's specific energy consumption and/or of specific CO_2-emissions of the same order until the year 2005 (base year 1990). In exchange, the industrial associations expect that policy will give priority to these voluntary initiatives against other regulatory or fiscal climate policy instruments. As a reply to the initiative, in 1995 the federal government announced via press release the withdrawal of plans to introduce a waste heat ordinance (WNVO) and confirmed in 1996 (again via press release) its position, that the participating industries will be excepted from any coming CO_2/energy taxation on EU level, e.g. by national compensation schemes (Bundesregierung 1995, 1996).

The Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI) has been entrusted to carry out a sectoral monitoring and so far, one report has been published end of 1997 (BDI 1996b; RWI 1997). As a first response to the results, an additional CO_2 reduction potential of 10 to 20 Mt/a was identified by the federal government as a starting point for negotiations on modification of targets and procedures (Bundesregierung 1997).[2] In addition, an extension of the target definitions in order to cover all six GHG from the Kyoto protocoll as well as an enlargement of the initiative including new sectors have been subjects to informal industry-government talks in summer 1998, but all official discussions ceased after the shift of government in September 1998 and the introduction of an energy tax as the main pillar of an ecological tax reform.[3] The future development of the initiative is pending.

Having the historical background of this development in mind, some characteristic features are relevant for a better understanding of the DGWP's performance:

- German industry published an unilateral declaration without any legally binding commitment neither of the association nor of the individual member company. The political reaction is limited to two press releases and does not present any legally fixed commitment neither. Up to September 1998 the institutional frame could be characterised as bi-lateral goodwill, so that the DGWP does not count as a voluntary agreement in the sense of a negotiated bilateral treaty such as the Dutch LTA (Clausen & Zundel 1995; Rennings et al. 1996). Due to the fact, that the whole industry benefits from the withdrawal from regulation and taxation, free rider problems can occur with regard to passive member companies of the association which published a declaration, to non-member firms from the sector not covered by the branch association, and to whole sectors without branch declarations such as food and beverages.
- The various branch declarations differ in terms of time frame and compatibility to the overall reduction goal of the umbrella declaration, so that the overall goal cannot be concluded from the sum of branch targets. Moreover, the branch targets are characterised by partially vague, inconsistent and incomprehensive descriptions of targets, actors, tasks and procedures. For instance, standardized methodologies and definitions concerning evaluation and assessment of energy inputs e.g. for CHP or secondary fuels are unclear or completly missing. An overview on the divergent targets is given in Tab. 1.

[2] The 2nd monitoring report was due to November 1998, but has not been published yet (April 1999).

[3] The energy tax scheme includes the following rates: 0,03 € per liter gasoline, 0,02 € per liter light oil, 0,02 € per kWh natural gas, and 0,01 € per kWh electricity. Manufacturing industry pays a reduced rate of 20%. The tax revenues are recycled by a decrease of labour costs.

Table 1. Overview of Sectoral Targets within The DGWP (Source: RWI 1997, 4)

Sector and Association	Base year	Reference Variable	Reduction in %
Potash Industry: Kaliverein	1990	t CO_2/t Raw Salt,	66
		mt CO_2	78
Cement Industry: Vereinigung Deutscher Zementwerke	1987	KJ Fuel/kg Cement	20
Lime Industry: Bundesverband der Deutschen Kalkindustrie	1987	kJ Fuel/t Lime	15-20
Ceramic Tiles and Slabs: Bundesverband keramische Fliesen und Platten	1990	kg CO_2/t Tiles and Slabs	20
		kWh/t Tiles and Slabs	25
Brick Industry: Bundesverband der Deutschen Ziegelindustrie	1990	kJ/kg Bricks	28
Refractory Industry: Bundesverband der Feuerfest-Industrie[1]	1987	kg CO_2/t Refractory Products	15 - 20
Iron and Steel Industry: Wirtschaftsvereinigung Stahl	1990	kg CO_2/t Rolled Steel	16 - 17
		mt CO_2	21 - 27
Non-ferrous Metal Industry: Wirtschaftsvereinigung Metalle	1990	GJ/t NF-Metals	22
Chemical Industry[2]: Verband der Chemischen Industrie	1990	Energy Index/Production Index	30
	1987	mt CO_2	44
Paper Industry: Verband Deutscher Papierfabriken	1990	kg CO_2/t Paper	22
		GJ/t Paper	20
Glass Industry: Bundesverband Glas und Mineralfaser	1987	kg CO_2/t Glass	25
		GJ/t Glass	22
Textile Industry: Gesamtverband der Textilindustrie	1987	PJ/a	20
Sugar Industry: Verein der Zuckerindustrie	1990	kWh/dt Beet Processing	40
Public Electricity Supply: Vereinigung deutscher Elektrizitätswerke (VDEW)[3]	1990	mt CO_2	12
Petroleum Industry: Mineralölwirtschafts-verband (MWV)	1990	Litres Heating Oil/m^2 Residential Accomodation	25
Gas Industry: Bundesverband der Gas- und Wasserwirtschaft (BGW)	1990	kg CO_2/kWh Net Energy	34
Association Municipal Enterprises (VKU)	1990	mt CO_2	25

(1) The data refer exclusively to the West German states. (2) In relation to the year 1990, the Chemicals Industry expects a reduction in absolute CO_2 emissions by 23.8 m t. by the year 2005. (3) Reduction target by the year 2015. By the year 2005, the VDEW expects a CO_2 reduction in the amount of 8 to 10 %.

- There was no independent ex-ante assessment and public discussion of existing energy saving potentials, which could define a reliable scope for efficiency measures and could suggest intermediate sub-targets as an implementation schedule in order to assess the implementation progress. Individual targets and concrete energy saving plans on the level of the participating firms or any kind of task lists with time schedules are missing.

Problems and Prospects - Lessons from the Policy Process

The previous section gave a short overview of the history and the initial design of the DGWP which was far from being perfect - but from the official reading, the DGWP represents a useful contribution to German climate policy, because it promises to induce social learning processes in the field of energy efficiency (Bundesregierung 1995, 1996). Now after three years of operation German government and industry have thus to answer the two questions:

- What is the actual impact of the DGWP on energy efficiency measures in industry (static performance evaluation, section 3.1)?
- What is the DGWP's contribution to lasting change dynamics both on industry and policy level (dynamic process evaluation, section 3.2)?

Static Performance Evaluation

German federal government and industry derive the conclusion from the first monitoring report (published in November 1997), that the DGWP represents a promising and effective instrument for climate policy strategies (Bundesregierung 1997; BDI 1997). This interpretation, however, is rejected by our analyses. Contrary to the assertion of the federal government and the BDI, in our view neither any extraordinary efforts of industry for climate protection nor any instrumental superiority of the DGWP compared to a waste heat ordinance or other climate policy instruments could be proved by the monitoring results. From the BDI perspective, the first monitoring report indicates, that the DGWP makes a higher contribution to climate protection than a waste heat ordinance. This conclusion is wrong and results from a mis-interpretation of a comparison made in the monitoring report between the declarations of selected sectors with base year 1990 and the reference path of the Prognos study with base year 1992 (Kristof & Ramesohl 1997; RWI 1997, 5; Prognos 1996). In its conclusion, the BDI neglects the dramatic decline of the east German basic industries in the period of 1990-1992 and the related significant reductions in energy consumption. Taking these reductions into account, the estimated impact of the DGWP on energy efficiency in industry is much smaller than that of a waste heat ordinance as estimated by Prognos. In our opinion, five key findings from the monitoring reports have to be emphasised:

- **High degree of ex-ante target achievement.** To a great extent, the targets for 2005 have already been achieved in 1995 (resp. 1996), i.e. in the years of declaration (see Fig. 1). Beside technical improvements in West Germany, the reasons are mainly structural changes of East Germany industry after the country's reunification in 1990. In addition, Figure 1 points at the impacts of structural changes and business cycles on sectoral energy use, which cause changes and even increases in specific energy consumption.
- **Incomplete coverage of energy flows.** The sectoral declarations and related monitoring reports do not cover the complete energy consumption. Fuels, electricity use and energy flows relevant to CO_2 emissions are missing such as fossil fuel consumption for non-energetic use, which represents 964 PJ in 1994, i.e. 7 % of German primary energy use with a CO_2 reduction potential of 72 Mt CO_2 (Patel 1996).
- **Little extraordinary efforts.** The major part of the listed measures for CO_2 reduction can hardly be classified as distinct efforts for climate protection but represent business-as-usual replacement and long-term planned capacity enhancement investments (such as large capital investments like blast furnaces)

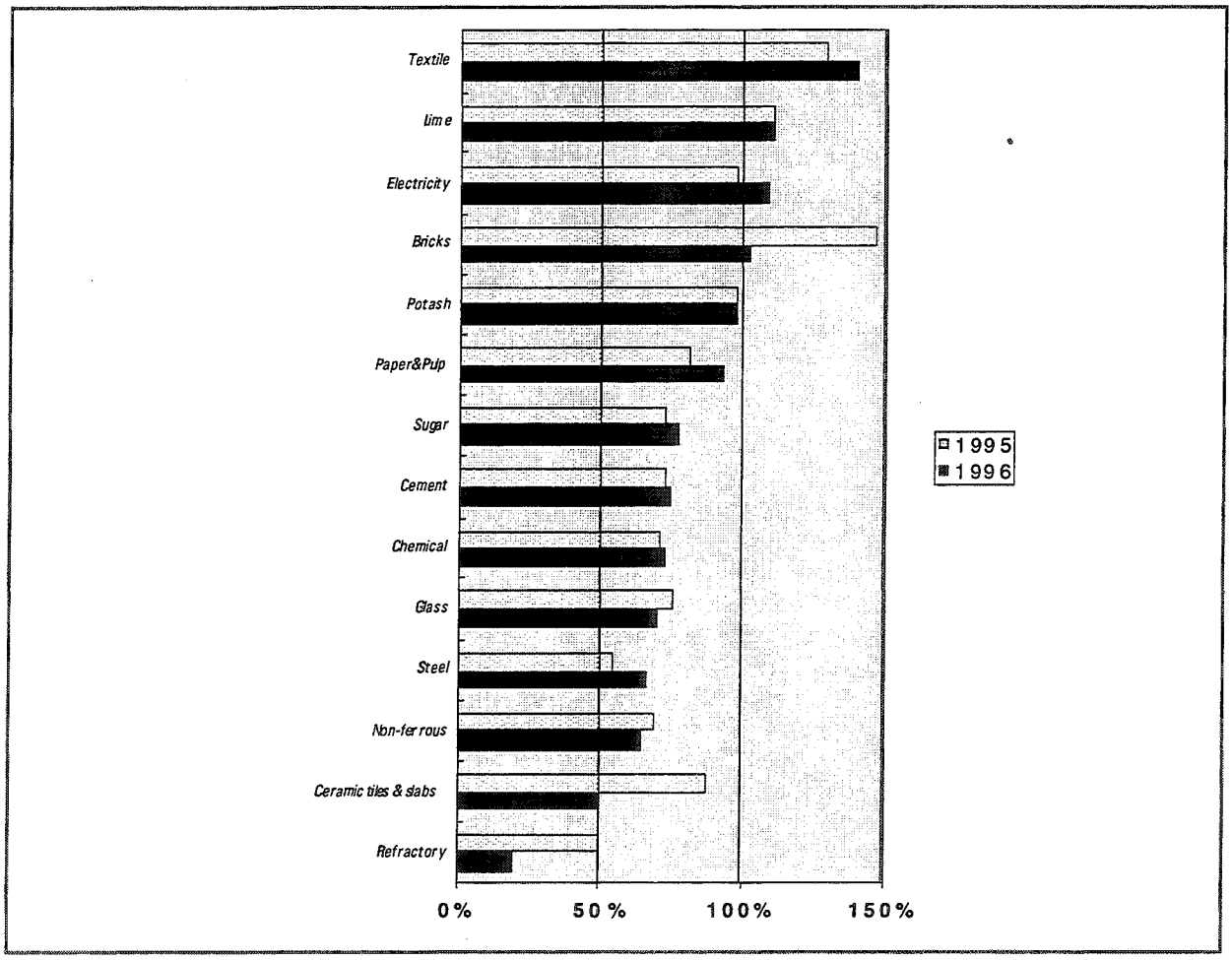

Figure 1. Degree of Target Achievement at the Moment of Publication of the First Version of the DGWP (1995) and the Update (1996) (Source: RWI 1997)

- **Neglection of structural effects.** The monitoring procedure is characterised by a lack of an assessment of the business-as-usual case as point of reference for the actual implementation case. Changes of boundary conditions such as economic growth effects, business cycles, altering energy prices or structural changes are not explicitly examined, although industrial energy consumption is strongly determined by structural effects between branches (inter-industrial) and within branches (intra-industrial) (Jochem & Bradke 1996). Taking the non-ferrous metal sector as an example, a structural analysis indicates, that the major part of efficiency gains result from intra-sectoral changes (Eichhammer 1998). Just by a simple disaggregation of the non-ferrous metal branch into primary aluminium production and other non-ferrous metals, it is possible to consider the impact of the decline in physical primary aluminium production which decreased between 1990 to 1994 from 740 kt to 503 kt, but recovered afterwards to 575 kt in 1996 (Fig. 2 next page). Correcting for the impact of these changes in physical production (specific consumption at constant structure), the decline in specific energy consumption (GJ per t) is much less than stated in the monitoring report (actual specific consumption), and the degree of target achievement drops from reported 60% off to some 10%.

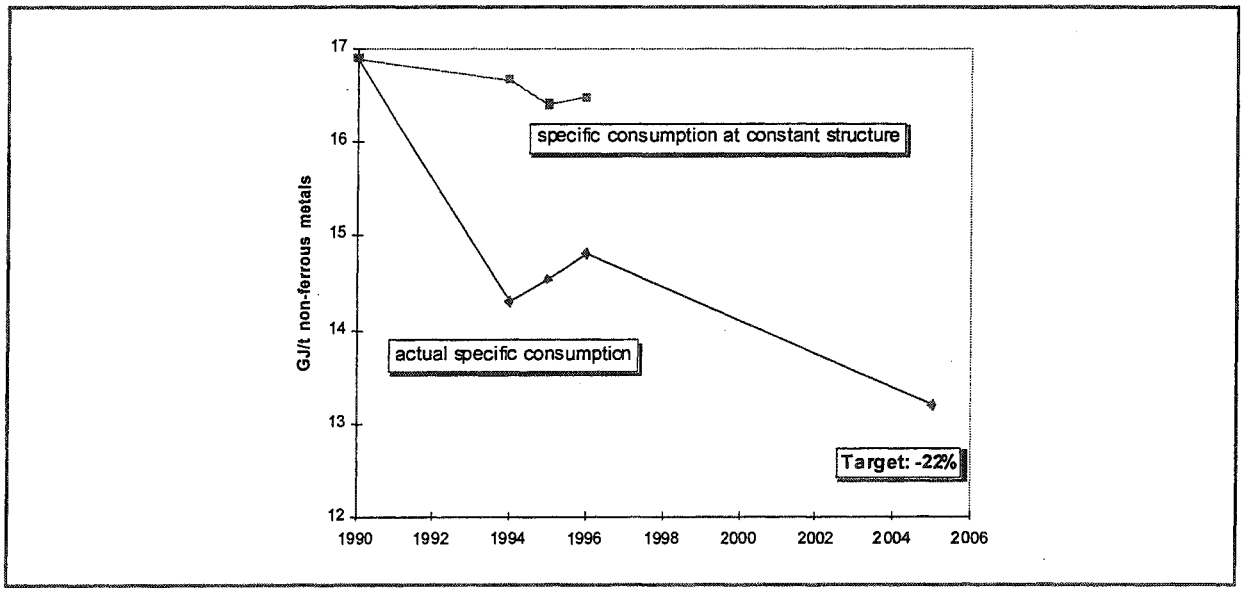

Figure 2. Specific Consumption of the Non-Ferrous Metals Branch in Germany: Actual and at Constant Structure (only taking into Account Structural Changes Stemming from Primary Aluminium Production) (Source: Eichhammer 1998)

- **Insufficient quality of branch reports.** As a general remark, the quality of the monitoring scheme itself can be questioned, because the RWI is responsible for collecting and processing the data for the monitoring report which is provided by the branch organisations themselves. The experiences with the first branch reports show, that sectoral data was of insufficient quality, characterized by severe deficiencies concerning completeness, transparency and credibility (RWI 1997, 58f).

Dynamic Process Evaluation

Due to the relatively short implementation period of 1995-1998, there is only little empirical evidence available at the present stage, and it is much too early for an in-depth analysis of the dynamics, prospects and future potentials of the DGWP process. However, when looking at first observations and experiences a very crude and preliminary appraisal can be derived:

- **New fora for discussion.** On the branch level, several CO_2-policy committees or working groups have been established, or existing groups gained importance, now involving top-level executives. This is a sign of increasing institutional penetration and establishment of the subject, which has been missing so far. Even if such working groups initially might serve as a *pro forma* sign of activity, they tend to gain self-dynamics which opens the possibility for new arenas of discussion.
- **Start of inter-firm exchange of knowledge.** Efficiency related inter-firm communication and cooperation seems to have developed, fostering exchange of technological know-how and best-practice experiences. In this regard, the cement industry can serve as an outstanding positive example, where the traditionally open and intense exchange of technical information between cement producers gained additional momentum. A series of best-practice workshops, organized by the VIK, provided a supplementary impetus for specific discussions of state-of-the-art technologies in several branches. However, frame conditions such as the degree of intra-sectoral competition impose strict limits to improving exchange of information and know-how. Due to the different sectoral conditions, a general assessment of technology diffusion cannot be made without more sophisticated analyses.

- **Missing mobilization.** Not regarding single exceptions, a broader mobilisation of the majority of firms in the sense of changing energy management attitudes does not seem to take place. Neither a comprehensive involvement of companies into systematic assessments of efficiency potentials nor convincing individual commitments to realise concrete reductions and measures beyond business-as-usual on a broader scale can be observed.
- **Little influence on investment practice.** Solitary anecdotal evidence points at a rising importance of energy efficiency and climate change as a top management issue. In some cases, the sector's commitment served as a successful argument for middle management to push high efficiency solutions vs. a less efficient investment alternatives. However, significant changes in investment rules can hardly be expected, this holds especially for sectors with a high share of foreign capital control such as the aluminium industry.
- **Opportunities for benchmarking through mandatory data collection.** The mandatory data collection and analysis within the monitoring procedure provides a basis for new discussion within the firms and among branch members about potential contributions to national CO_2 abatement strategies. However, it remains unclear whether sectoral benchmark and collective improvement processes could have been stimulated.

As mentioned earlier, the shift in governmental policy towards enery taxes stalleded the DGWP process, and for the last six months, very little official action could be observed. The future prospects of the DGWP are thus difficult to assess. Making the assumption, that industry agrees to continue the process, it can be expected that minor improvements concerning operational and administrative issues such as data accessibility, harmonization of databases, layout and quality of monitoring reports etc. will take place. In this regard, a gradual learning by doing seems to be likely. However, these aspects are only of secondary importance. Due to the preliminary character and the stated principle deficiencies of the DGWP, the implementation trajectories and the underlying target definitions itself have to be subject of permant analysis and revision in order to eliminate pre-mature design features. Here, comprehensive action is still missing and substantial modifications such as a shift from specific to absolute targets, increase in quality of targets or establishment of effective enforcement mechanisms are much less probable. This holds, although first indications for informal revision negotiations between the ministries and several branches in summer 1998 could be found.

Summing up, data collection and an intensified communication on energy and efficiency issues can be seen as an indirect, but nonetheless crucial soft factor to stimulate new activities. Social learning might take place on all policy, sectoral and company levels - but it remains unclear how this will affect institutional arrangements and concrete guidelines for action. The question remains how to use the monitoring results, so that the whole process is characterised by the drawback, that no procedure for evaluation and adaptation has been defined and agreed upon. There are no clear-cut rules nor criteria how to change course, e.g. by feeding monitoring results back into negotiations on targets and methodologies. In the worst case this implies that no change takes place until end of the current period of validity in 2005. Under these conditions, the officially postulated process of implementation and ongoing improvement the DGWP might be possible - but climate policy cannot count on it, and a significant contribution to long-term structural changes can hardly be expected. With regard to the comprehensive understanding of sustainable energy and climate policies presented in section 3, major modifications have thus to be undertaken in order to improve the DGWP process and to turn the initiative into an effective driving force of post-Kyoto CO_2 mitigation strategies.

A Dynamic Approach for Climate Policy Making

As a general guideline, any revision and development of voluntary initiatives for CO_2 abatement in industry should be oriented towards a stimulation of comprehensive and lasting changes of technical and organisational structures of industrial energy use. These changes

cannot be achieved at one stroke but result from permanent interactions on two levels, which thus represent two principal impact areas for process oriented policy-making:

On the **level of operational efficiency**, the original objective of the DGWP scheme as part of the German climate policy mix has to be seen in the inducement of new management attitudes, procurement practices and knowledge resources on the firm level. As recent socio-economic research emphasizes (InterSEE 1998; SORGET 1998), efficiency measures are not exclusively determined by techno-economic parameters but are strongly influenced by social, psychological and organisational factors and their interdependencies. In this context, continuing and self-enforcing dynamics of efficiency measures can be expected, if the sequence of analysis, target definition, commitment, action, evaluation and re-formulation of new targets gets an iterative momentum in the firm. Hence, the establishment and consolidation of sustainable **energy management cycles** (e.g. corresponding to the EU environmental management and audit scheme) can be seen as a primary contribution to far-reaching energy policy strategies.

On the **level of strategic commitment**, long-lasting and far-reaching business decisions such as technology RD&D, strategic investment planning and design of product portfolios are concerned. In this respect, the endeavors of the single firms are embedded into the institutional frame of the sectoral declaration and the underlying national climate policy. Serving as point of reference and as long-term strategic orientation to firm executives, the design of the institutional framework should thus correspond to the underlying societal priorities and a clearly stated political will to act (i.e. the unequivocal will to exploit all feasible options to achieve a defined policy target). The expression of reliable policy commitment for instance should include a clear-cut burden sharing of national CO_2 reduction obligations among end use sectors, and convincing alternatives for an enforcement of policy goals. Necessary adaptations to altering boundary conditions (e.g. economic growth or recession, EU regulation) or new scientific insights (e.g. concerning abatement costs) should be evaluated, communicated and integrated according to commonly accepted and reliable policy procedures. This helps to increase the security of long-term planning in industry, and to reward pro-active behaviour while sanctioning free-riders. In this context, a continuous and pre-defined sequence of target definition, implementation, monitoring and verification, and target revision in the sense of a **policy learning cycle** will contribute to self-dynamic improvement and refinement of the institutional frame in a changing environment.

On both levels, considerable effort will be needed to change prevailing structures, routines and paradigms. Apart from a limited number of eco-pioneers, however, the majority of firms hardly perceive any incentives nor possi-bilites for changing course under current conditions. For this reason, the evolvement of energy management cycles is closely linked to altering frame conditions, and thus to policy learning cycles. In addition, the official recognition of abatement efforts undertaken by single industrial entities require the set up of national monitoring and verification infrastructures which are completely missing at the present stage. In this respect, little of the ad-ministrative requirements imposed by the Kyoto protocol have been satisfyingly specified and fulfilled (e.g. with regard to flexible mechanisms). In our view, thus, these two perspectives cannot be separated but have to be seen as two parallel trajectories of the same policy process, and they have to be simultaneously developped by all participants. In this understanding, the major challenge for climate policy can be seen in stimulating and facilitating a **co-evolution** of paradigms and management practices of industrial energy use on the one hand, and the performance of corresponding climate policy targets, institutions and infrastructures on the other hand (Fig. 3).

As an important contribution to the mentioned search process for sustainable energy futures, both trajectories of this co-evolution require significant and lasting behavioural and organizational changes in industry and administration. This takes time and needs permanent re-orientation, feedback and incentives to feed and maintain the adaptation process. Accordingly, individual energy management cycles and policy learning cycles have to be linked and twisted, forming a **double-helix of dynamic climate policy** in time.

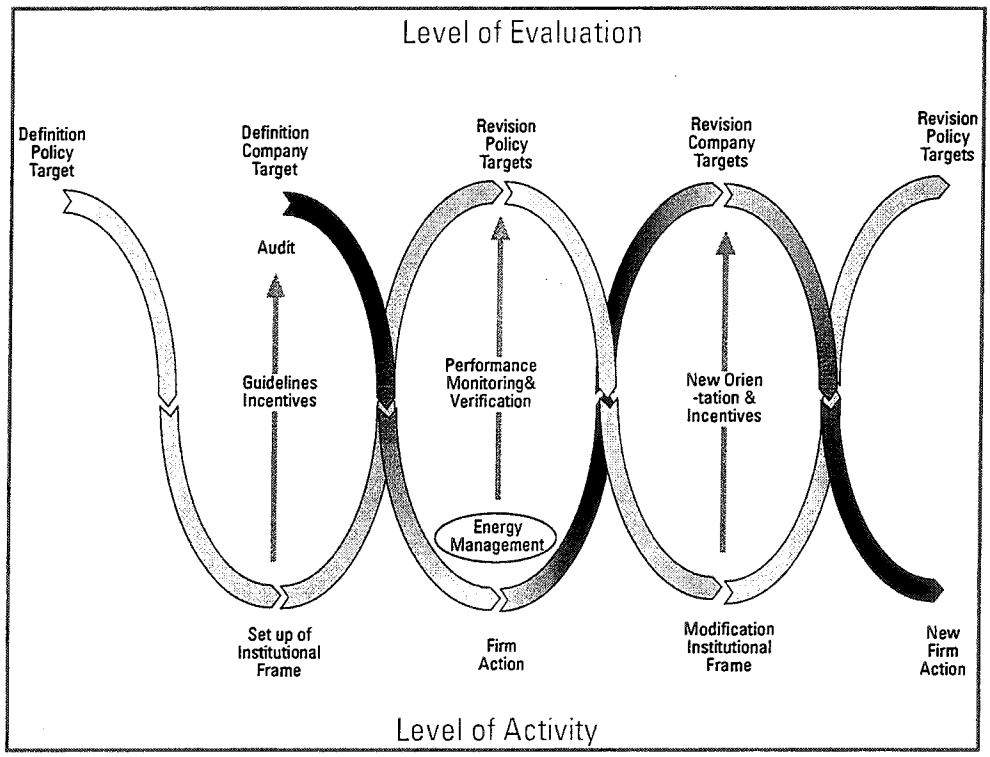

Figure 3: Double-Helix of Dynamic Climate Policy-Making

Conclusions

From an industry's perspective, the DGWP represents a pragmatic, flexible but nonetheless effective approach for industrial climate policy, which has proven superiority to other regulatory instruments or taxation. By this claim, however, industry itself imposes tough requirements to the design and implementation of the instrument, which have not been met yet. The static performance evaluation pointed at severe deficiences of the current implementation practice of the instrument. The experiences from the first monitoring period emphasise the need for significant conceptual and methodological adjustments, especially with regard to the dynamic refinement and validation of targets and measures. Under the current situation, however, significant modifications and new impulses can hardly be expected, mainly due to two reasons:

On the one hand, an expansion and refinement of the DGWP is hindered by insufficient administrative capacities. Industry has suffered from downsizing in the field of non-productive administration, which puts most sector associations under severe cost pressure. In most cases, administration, communication and all other tasks related to the DGWP can be seen as extra work load on top of existing charges. The same holds for the ministries' administrations, and an infrastructure such as NOVEM in the Netherlands or the DEA in Denmark is missing. At the moment, on the national level the whole policy and monitoring process is carried out by just a handful of actors in politics, industry and research, which is clearly not enough to handle an initiative in a target group of this size, complexity and political importance such as German industry. Obviously, the needed more comprehensive analytic, monitoring and coaching tasks as well as organisational requirements can hardly be fullfilled without expanding the related workforce.

On the other hand, from the very beginning the voluntary approach was more tolerated than accepted by political forces, and especially most parts of the ministerial administration have

remained sceptical. Thus, the instrument has never been fully backed by politics nor received any broader public attention. Under the new government, a distinct and new impetus is not very likely, because as a prominent element of their political agenda, the new coalition of Social-democrats and Greens introduced energy taxes as a first step of an ecological tax reform. Details of future stages of the tax scheme are still under negotiation, but so far (April 1999), there is no recognition of the DGWP as an exception of tax payment. The future of the DGWP, thus is left open to a change in political priorities, and meanwhile, to industry's reaction which might be either withdrawal, suspension or continuation of the initiative.

With respect to the recent policy shift, German climate policy is now at a turning point, which creates a particular uncertainty for the future use of energy related voluntary approaches in industry. Nonetheless, some lessons can be learned from the German experiences which are of high value for post-Kyoto climate policy in general. Neither the DGWP nor any other instrument works and runs on its own, but has to be explicitly stimulated, managed and developed in order to generate the needed process of co-evolution. The actual performance of any instrument depends to a large extent on the practical details of implementation and administration, which have to be permanentely assessed and revised. Therefore, even flexible instruments are neither necessarily cheap nor free – their effectiveness and success is closely linked to the evolution and use of adequate administration capacities and practical, meaningful monitoring schemes. Correspondingly, successful policy requires significant information and data as well as supportive infrastructure. Both industry and politics, thus, have to provide sufficient funds and personnel capacities to enable a proper implementation of any kind of instrument.

Looking at the prevailing debates on various approaches of regulation, taxation, flexible mechanism etc., we derive the conclusion that theoretical debates on instruments are of secondary importance for post-Kyoto climate policy. By contrast, climate policy design, management and evaluation have primarily to focus on the practical impact of instruments on long-lasting change dynamics concerning the energy mangement practices on the firm level. Instruments have to alter subjective perceptions of the benefits of energy efficiency activities, to increase the knowledge about opportunities to act and to improve the abilities to act. So far, there is no striking evidence from theoretical considerations nor from international experiences that any instrument will be able to accomplish this task alone. Thus, post-Kyoto climate politics and the underlying challenge of sustainable energy systems require comprehensive and integrated strategies, and there is no easy way to go - society has to keep taking the effort to work it out.

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