

## Greening subsidies in Germany – Interlinkages to selected policies

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### **1. Introduction**

In Germany and in many other countries the environment has traditionally been treated as a separate and discrete area of policy-making. Due to changing problem structures and an increasing knowledge and awareness about these changing problem structures (e.g. the temporal, spatial and structural implications of climate change) this approach has for some time been characterised as only ad-hoc, piecemeal and reactive. By now and along with the concept of Sustainable Development a shift in perspective can be observed which is well captured in the principle of Environmental Policy Integration (EPI). It is not only discussed in academia but has also been given a prominent place in the EU treaties: “Environmental protection requirements must be integrated into the definition and implementation of the Community policies [...] in particular with a view to promoting sustainable development” (Art. 6 EU Treaty). Basically this principle emphasises the potential discrepancies between policy-making in highly specialised and fragmented policy (sub-)fields and the requirements of environmental protection. Often these policy fields have a long tradition and were institutionalised at a time when environmental concerns played only a minor role in the political agenda. At the same time, however, these non-environmental policy sectors have created incentive structures and mechanisms and used policy instruments which do not only (partly) conflict with environmental concerns and the changing environmental problem structures but turn out to be quite resistant to change.

A typical policy instrument that comes to mind is subsidies.<sup>1</sup> Massive support schemes in favour of intensive farming, the construction of single occupancy houses in the countryside or CO<sub>2</sub>-intensive coal mining, and the distortions and loop-holes in the “historically grown” tax system, with its strong focus on taxing labour rather than natural resources, are just among the most striking examples to demonstrate the environmentally harmful or at least problematic effects of subsidies. The term “environmentally harmful subsidies” (sometimes “perverse” subsidies) therefore results from the increasing recognition and awareness that activities induced by subsidies may not only harm the economy, distort the level playing field and exacerbate the public sector deficit and debt problem but have undesirable (and sometimes unexpected) consequences on the environment (OECD, 2003). As a result, these incentive mechanisms gain in importance when conceptualising environmental policy as part of a broader concept of policy-making aiming at sustainability, coherence and consistency.

Yet, with regard to environmental policy subsidies have traditionally been dealt with from a rather narrow instrumental perspective. According to this perspective the public administration as well as politicians, when faced with a political problem, have a “tool-box” of instruments at their disposal from which they choose the most suitable (“the best”) instrument (Böcher and Töller, 2003). This approach can be found both among practitioners as well as scholars (especially jurists and economists) with the implications being different depending on the underlying notion of rationality (political, economic, legal). Policy-makers typically used subsidies along with the traditional (but confined) “command-and-control” policies to alleviate pressing envi-

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<sup>1</sup> We cannot elaborate on definitions here. See Rave and Sprenger (2003) for a broader discussion. For the purpose of this paper we take Hansmeyer (1977) as a working definition of subsidies: “Subsidies are direct or indirect payments or other privileges granted by a government or one of its agents to private firms without a market-like quid pro quo. Instead, the firms concerned are expected to display a certain change of behaviour (or a continuity of behaviour otherwise not planned) which assists in the accomplishment of political objectives.”

ronmental problems related to ambient air pollution, waste water pollution and waste management (e.g. by promoting the introduction of catalytic converters). Often subsidies proved helpful, because they were quite easily available and could be applied for varying purposes. At the same time, subsidies turned out to be useful when compromises needed to be made and acceptance for new initiatives of environmental policy had to be gained. Welfare economists in turn have tried to categorise cases where subsidies provide first or second-best instruments for environmental policy (typically to internalise positive externalities). This also gave rise to criticism on the efficiency losses of real-life subsidies. However, their approach can be considered as more or less “institution-free”, with little attention being paid to the specifics of the political, legal and social context. More recently, theoretical as well as practical approaches dealing with environmental concerns, on the one hand, and public policy instruments, on the other hand, have taken a broader perspective.

With respect to environmentally harmful (or problematic) subsidies, however, single case studies or the “list approach” prevails. Case studies provide interesting details but often do not explore further links to the level of programs and policies. Lists with potentially harmful subsidies provide an interesting (quantitative) overview for policy-makers but often lack a common denominator. Thus, both approaches provide only limited insights or a limited amount of conceptual coherence necessary for reform initiatives.<sup>2</sup>

This paper takes into account the recent change in perspective (symbolised by the principle of EPI) and provides a conceptual link to the level of policy instruments. It explicitly focuses on subsidies in selected non-environmental policy sectors (or fields), tracing typical changes in policy patterns in general and greening mechanisms in particular. Following concepts of the “new institutionalism” as well as the literature on policy analyses and public policy instruments, we emphasise that the use of instruments is institutionally embedded and that their selection, application and evaluation needs to be properly contextualised. We proceed as follows: Section 2 provides an analytical framework which helps to structure the complexity that arises when relating various subsidies to their potential effects on the environment. This framework is mainly based on what has been called the contingentist or instrument-context approach to public policy instruments. According to this approach the performance of policy instruments is basically contingent on the goodness of fit between policy tool and policy context (or the requirements of a particular problem setting). These analytical considerations serve to identify a number of conceptually different sources and mechanisms for potential greening of subsidies and subsidy structures. In Section 3, the analytical framework will be tested (or rather explored) in light of empirical findings and policy analyses on German regional policy and energy policy. Section 4 summarises the preliminary results, compares the two case studies and concludes.

## 2. Analytical framework

Policy instruments are a means an actor uses or could potentially use to aid in the attainment of one or more policy objectives (Bruijn and Hufen, 1998). Instruments can be characterised, in the abstract, as objects (e.g. a legal directive). But only if these abstract objects are transformed into activities and actions can intentions be converted into policy actions and bring about policy outputs and effects.

Approaches in the study of instruments differ in terms of the theoretical and methodological positions and the analytical level they focus on (Böcher and Töller, 2003). A useful starting point is to analytically distinguish between the classical instrumentalist approach and contextual approaches (Bruijn and Hufen, 1998). The former claim that the nature of instruments (i.e. the

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<sup>2</sup> In Rave (2005) we provide a broader picture on how to conceptualise the reform of environmentally harmful subsidies.

nature of the “objects”) structures the course of policy processes. Thus, different tools of government have their distinctive characteristics and dynamics, their own “political economies” and affect the context of government action in a particular way. This perspective often leads to the construction of extensive typologies or ready-to-use “tool boxes” with supporters claiming that they understand the inner workings of a particular instrument (in terms of particular criteria like effectiveness, efficiency) in order to realise a successful policy or to turn policy failure into policy success. Accordingly, analysis focuses on the traits and characteristics of instruments, with an aim to identify, refine and extend a small repertoire of “universal” instruments to a wide range of applications and to document optimal performance under varying but given constraints (Linder and Peters, 1998). Whereas no real attempt is made at contextualising the role of instruments, the latter (the “proceduralists” or “contextualists”) start from a particular, concrete problem focusing on a number of contextual variables. Instruments are only one of the many factors that determine the course of policy processes, and analysis is less concerned with instruments. Instruments rather emerge as by-products of particular policy processes, and analysts focus on the study of policy systems, policy networks, decision-making arenas or implementation processes. Thus, in the end little may be said about instruments and their significance, relative performance etc.

### Linking instruments and context

We suggest creating a bridge between these two extremes and (largely) building on what has been called the instrument context (Bruijn and Hufen, 1998) or the contingentist approach (Linder and Peters, 1998). Following this approach means that both the characteristics of the instruments and the variables from the context in which the instruments are applied matter. As opposed to the contextual approach, we refer less to the specificities and dynamics of particular actor constellations and policy processes (e.g. the implementation and application of an instrument in a particular setting) but operate more on a typological level highlighting the (changing) relationship between a mixture of conditions or constraints and the performance characteristics of the instrument. In contrast to the instrumentalist approach we do not so much stress inherent properties of an instrument. Thus, in essence we strive to explain the level of compatibility or the goodness of fit between instrument and context (Knill, 1998).<sup>3</sup> Changes in the level of compatibility may eventually allow us to draw lessons on successful EPI or greening.

Figure 1 depicts the basic reference framework for analysing the sectoral-environmental interface and the changing role of subsidies therein.<sup>4</sup> We primarily look at the interdependence between instrumental and contextual variables with each having a number of distinct components. Instrumental and contextual variables in turn interact with actor-related aspects. Actors and actor-constellations provide input and influence the role of instruments and/or their respective context, but they are also affected by “autonomous” changes of contextual and instrumental variables (e.g. by a change in the legal system). To reflect changes or persistence in the design or use of instruments, the interplay between these variables is conceptualised as a process in historical time (time axis).

As for the instrumental characteristics the following basic components (or drivers) may have to be mentioned. On a more technical level, the criteria and the instrumental design may change. On the “strategic” level, the relationship between means and ends may change (e.g. due to the occurrence of new policy objectives). Also, there may be a change in the composition of instruments. Finally, the availability of the instrument may vary leading either to the removal or the accumulation of the instrument. Actors may learn about instruments for realising prefer-

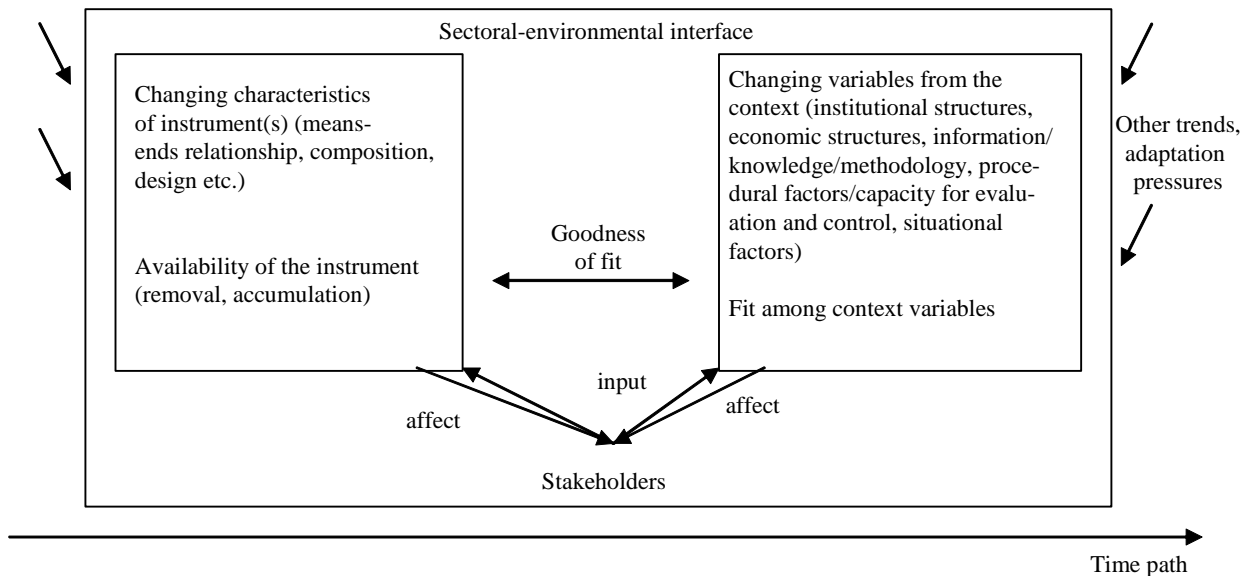
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<sup>3</sup> It is perhaps too early to speak of performance, since the term bears a strong normative connotation.

<sup>4</sup> For an approach which to some extent resembles (and extends) the framework presented here, see Böcher and Töller (2003).

ences and policy objectives or learn about desirable policy objectives (e.g. due to experiences in the past, in other countries) (Böcher and Töller, 2003). On the other hand instrumental design (and systematic assessment of alternative instruments) may shape actor's perceptions and political "battles".

Fig. 1: The instrument-context approach



Context is a rather broad term which makes it more difficult to come up with distinct components thereof. First of all, institutions are an important factor restricting as well as stimulating and enabling action.<sup>5</sup> To a considerable degree they influence the policy process and its results without determining them. Institutions can be defined as “the rules used by individuals for determining who and what are included in decision situations, how information is structured, what action can be taken and in what sequence and how individual action will be aggregated into collective decisions” (Kiser and Ostrom, 1983). On the national level institutional structures of interest may include the allocation of competencies and responsibilities in a federal state and cabinet/ministerial structures, including the respective mechanisms of co-ordination and patterns of interaction between actors. Taking into account the influence of the EU (or international regimes) on German policy-making may increase the problem-solving capacity of Member States, but also restrict the autonomy at the national level (due to regulatory control of instrument use and design). As mentioned above, institutional conditions are closely related to the respective actor constellation (number of stakeholders, relative power and resources etc.).

A second component refers to economic structures. Economic development affects the problem as well as the opportunity structures of policy-making (Jänicke, 1996). Furthermore growth rates and technological progress vary substantially over time and depending on the region or sector considered (structural change).

Another contextual variable as well as condition for action in environmental policy refers to the “production”, creation and diffusion of information, knowledge and awareness. In a more narrow sense this includes reliable theoretical, methodological and empirical input from research, which is often indispensable given the complexity of policy-making. These inputs in turn may feed back into the political-administrative system and create capacities for evaluation, monitor-

<sup>5</sup> In a wider sense the literature sometimes refers to systemic conditions for action (e.g. Jänicke, 1996).

ing and controlling (procedural factors). In a wider sense, this factor relates to interpretative patterns and cognitive schemata.

Finally, situational factors are often important in a particular context and help to explain policy success or failure. In particular situations – and sometimes as a result of coincidence – policy windows may open up and new policy solutions and ideas may move through it and onto the political agenda. Furthermore, changes may set a precedent for future action (e.g. in other sectors) and facilitate learning.

All these contextual components are interrelated in some way or the other. Thus, not only the goodness of fit between instrumental characteristics and context variables is at stake but also the fit among the conditions making up the context.

### Identifying sources and mechanisms for greening

Based on the framework briefly sketched above we suggest to identifying and specifying different sources and mechanisms of greening. While not completely mutually exclusive they allow for a structured discussion of different subsidy-related cases.

First of all, a few words on the term “greened subsidy” are in order. Most importantly, we do not further consider spending directed explicitly at environmental projects. This does not imply that subsidies with a primary environmental purpose are not in order in some defined cases. Increased spending for the environment does not constitute integrated policy-making, however, as long as the environmental impacts of other projects remain in the dark (Lenschow, 2002). To bring light into this darkness and go beyond vague statements about EPI, we thus concentrate on those cases or constellations where instrumental or contextual variables have been altered in non-environmental policy sectors to include environmental concerns. By contrast, a case of non-greening occurs when environmental aspects are neglected despite countervailing adaptation pressures.<sup>6</sup>

The term greening has obviously a dynamic component. Thus, greening is more likely to occur when there is a pressure to adapt to changing circumstances. This pressure may lead to specific re-alignments of the instrumental and contextual variables identified in the last section. The kind and the degree of adaptation and adaptation pressure will vary, of course.<sup>7</sup> It depends, broadly speaking, on the specific problem at stake and the capacity to deal with this problem. Despite the complexity that emerges here, we suggest distinguishing conceptually six social mechanisms of greening subsidies (in the narrow sense) and subsidy structures (in the wider sense) to characterise potential re-alignment of instrumental and contextual elements.<sup>8</sup> The first two work mostly through the instrumental side, the third and the fourth through the context, and the last two require more of an “autonomous” push:

1) Filtering: This may be considered the “weakest” and the least strategic form of greening. Environmentally harmful effects of subsidies are considered to be limited. Traditional regula-

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<sup>6</sup> Therefore this perspective also focuses on cases where subsidies are not removed or altered for a longer period of time. Bemelmans-Videc (1998, citing Heidenheimer et al.) suggests that government inaction, or non-decision, becomes a policy when it is pursued over time in a fairly consistent way against pressure to the contrary.

<sup>7</sup> For the concept adaptation pressure, see Knill (1998).

<sup>8</sup> The term mechanism is often not clearly defined in the literature. Here we use the definition of Mayntz (2003): Mechanisms are recurrent processes linking specified initial conditions and a specific outcome. They state how and by what intermediate steps a certain outcome follows from a set of initial conditions. A mechanism approach helps causal reconstruction. Mechanism statements aim at causal generalisations. In this paper we do not provide any ultimate causal proof but use mechanisms as a helpful heuristic device for a structured discussion.

- tory policies (“filters”) are judged to be sufficient (and to be sufficiently enforced) to confine environmentally harmful effects of subsidies.
- 2) **Optioning:** Environmentally harmful effects of subsidies may best be alleviated by applying new, alternative options. Typically, this implies that new instruments (like eco-taxes) are applied which follow the “polluter-pays” principle or the “user pays” principle (as more strongly advocated in the transport sector, for example). They develop their own dynamic, foster structural change and help to indirectly mitigate the negative environmental consequences of a particular subsidy.
  - 3) **Loose coupling:** Coupling refers to the strength of connectivity and the mutual dependency between units or actors (Zahariadis, 2003). Accordingly, loose coupling means that elements making up the sectoral-environmental interface are sufficiently loose and flexible to allow for a realignment, possibly in favour of environmental concerns. Due to the variance in delivery of a policy, or even slack, there is room for experimentation (e.g. when policies are implemented locally) but also a risk of fragmentation.
  - 4) **(Re-)framing:** Policy preferences and interests are often embedded in a frame of reference, which prestructures the thinking within a policy sector, a segment of society or any given echelon in an organisation (Lenschow, 2002). New ideas and concepts may change the point of reference. Greener subsidy structures may then result from a (typically slow) change of perceptions, positions, interests or even values. “Old” subsidies in turn may lose their legitimacy. This mechanism focuses more on actor constellations and processes of reflection and learning.
  - 5) **Decoupling/Unlocking:** Lock-ins in the narrow sense result from inefficient path-dependencies that create strong barriers to the adoption of more efficient technologies. In the wider sense, lock-in implies that there are systematic forces that make it difficult to change the development path of existing techno-institutional systems (Unruh, 2000). As “old” technologies are often subsidised, the modalities and conditions of support may be altered in a “technical” sense such that support is decoupled from environmentally harmful or resource-intensive input and output factors. Unlocking implies a clear-cut break with an existing technological trajectory. Also, the economic and political selection environment (with all its accumulated and embedded commitments) would have to be rearranged considerably to send clear signals for the direction of environmental innovation. Typically, this entails also a rearrangement of the support infrastructure (Nill, 2004).
  - 6) **Internalising:** External constraints, sudden shocks and crises may considerably alter actor constellations, institutional structures or even belief systems. This may open up environmental policy windows and opportunities for environmental agenda-setting.<sup>9</sup>

These mechanisms may be evaluated and judged by different criteria, like effectiveness, economic efficiency or political feasibility. Such an evaluation typically requires taking a closer look at single, well-defined cases where subsidies play an important role.

In the remainder of this paper we are more interested in broader policy patterns, however. Thus we illustrate our analytical framework in two case studies (in the wider sense), but do not provide any final answer on whether or not the mechanisms of greening subsidies or subsidy structures are good or bad in a normative sense. This means that there is still much to explore on the causal links between policy and outcome in the substantive sense (e.g. the negative side-effects of a particular subsidy on particular environmental resources). Also, many other interlinkages remain unexplored here (e.g. wider implications on competitiveness, employment, growth etc.) and no “ultimate” cost-benefit analysis on the macro-economic level is undertaken. Our analysis can therefore be characterised as probabilistic.

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<sup>9</sup> This mechanism means that external constraints become internal conditions for action. This is not equivalent to the welfare economic terminology “internalisation of external effects”.

### 3. Case Studies

Based on our analytical framework we explore the changing role of subsidies and opportunities and impediments for greening in two case studies: regional policy and energy policy. Both policy fields seem to be of interest given their strong reliance on subsidies over a long time. However, subsidies are still only one policy instrument used in both policy fields. Therefore we need to make a number of “conceptual shortcuts” and concentrate on basic policy patterns and the most prominent subsidies in the policy field as well as the most important linkages to environmental issues.<sup>10</sup> Both case studies first provide an overview of the policy field under consideration in terms of definition and initial conditions. Then we highlight the traditional role of subsidies therein. Finally, we identify various trends and adaptation pressures and explain if and how they enabled or restricted greening initiatives.<sup>11</sup>

#### 3.1 Regional policy

##### Definition and overview

In the literature there are numerous definitions for the term “region” and “regional policy” (Crow, 2001). Often a distinction is made between regional economic policy and spatial planning (spatial planning policy, *Raumordnungspolitik*). This distinction reflects a number of differences with respect to institutional (particularly ministerial) assignment, spatial classifications, the number of policy objectives considered, and the kind of instruments used (Klemmer, 1998). Regional economic policy in Germany attempts to reduce the locational disadvantages of regions that are characterised by low per capita income and/or a problematic economic structure. Many consider regional policy to be closely linked to economic policy in general, and economists have argued that regional economic policy (or regional structural policy) can improve national welfare and the overall efficiency of resource and factor allocation by removing market failures (e.g. agglomeration externalities) and regional bottlenecks. At the same time, however, regional policy is justified on distributional and political grounds. The German Basic Law (Art. 72 (2) and Art. 106 (3,2) GG) demands that (extreme) disparities between regions be levelled out (*Herstellung gleichwertiger Lebensverhältnisse*).

Spatial planning or development (policy) is often described in broader terms. It aims not only at influencing regional development processes to reduce regional disparities and accelerate economic growth but explicitly covers other policy objectives with implications on spatial development and use. Apart from “social” and cultural aspects (e.g. education and health policy goals) also environmental issues are explicitly at stake here. Spatial planning has therefore often been characterised as a cross-sectional task which requires the co-ordination and (possibly) co-operation of actors from different sectoral policies (Hoppe and Voelzkow, 1999).

Due to the diversity of policy goals and interests, spatial planning also considers a wider diversity of regions and uses a wider range of indicators and criteria to classify spatial phenomena. Regional economic policy in turn operates only with few indicators and typically uses traditional economic accounting conventions (e.g. labour market regions). As for the ministerial assignment, the main responsibilities for regional economic policy are usually located within the Ministries of Economics at both federal and Länder level whereas spatial planning (and regional, country and town planning at lower levels of government) cannot always be clearly lo-

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<sup>10</sup> This also means that there are numerous opportunities for refinement and further research along the way.

<sup>11</sup> We explicitly make the transformation from historical process to distinct mechanisms of greening in Section 4.

cated within traditional administrative structures. Finally, it is often emphasised that regional economic policy and spatial planning have different policy instruments at their disposition. Regional economic policy mainly operates with financial incentives (like subsidies); spatial planning policy uses, as the word indicates, an array of planning tools which basically indicate desirable use of spatial infrastructure or restrict less desirable use.

These basic differences already indicate that tensions within regional policy exist. Thus, regional policy may be conceptualised from different perspectives, but consensus on a final definition is unlikely to be reached. On the one hand, regional (economic) policy may be seen as part of a more comprehensive system of spatial planning (*Raumordnung*) with all its implications for co-ordinating regional policy (e.g. within the federal structure of Germany). On the other hand, different public concerns brought forward as a result of spatial and regional planning may easily conflict with more narrowly defined economic goals (especially growth of GDP).

### The role of subsidies: the co-ordination function of the GRW

The basic structures sketched above indicate that subsidies can be seen as a typical instrument of what has been termed regional economic policy. Following the literature we will therefore characterise the role of subsidies following various stages in the development of regional (economic) policy.

After World War II regional policy was firmly established and institutionalised as a policy field only at the end of the 1960s (Hoppe and Voelzkow, 1999; Ast, 1999). Before there was not only a lack of conceptual clarity about regional policy goals (*Leitbild*) but also a considerable amount of conflict over the allocation of competencies between federal, state and local governments. During this time subsidies were handed out in a rather uncoordinated way with a tendency to engage in inefficient forms of subsidy competition between the vertical levels of government. Attempts at improving the co-ordination vertically (between levels of government) as well as horizontally (between sectoral policies) were initiated in 1965 when the Regional Planning Act (*Raumordnungsgesetz*) was set up. However, in a time of increasing “planning euphoria” the approach developed was considered to be too abstract and inadequate to counteract the increasing economic disparities between urban and rural areas. As a result of the recession of 1966/67 and along with Keynesian ideas of economic policy-making, high priority was given to financial incentives. To avoid uncoordinated forms of support a more unified framework was called for.

An important milestone in regional economic policy was the introduction of the “Joint Task Improvement of Regional Economic Structures” (*Gemeinschaftsaufgabe Verbesserung der regionalen Wirtschaftsstruktur, GRW*).<sup>12</sup> Backed by changes in the German Basic Law (Art. 91a GG) it stipulates co-operation between the federal and the Länder governments and allows the federal level to influence regional economic policy. The GRW consists of annual framework plans that lay down the spatial coverage of the assisted areas and the priorities as well as broad measures and eligibility criteria for support. The key instrument of the GRW is a capital grant for industrial investment by private companies and – to a lesser degree – for investment in economic infrastructure.<sup>13</sup> Projects typically include the setting-up, expansion or modernisation of industrial parks or traffic- and energy-related infrastructure. The key eligibility criteria for GRW

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<sup>12</sup> Before the GRW, regional action programs were implemented between the federal and the Länder level. While various elements of these two support systems are similar, the regional action programs can be characterised as a bilateral support system whereas the GRW is multi-lateral (Crow, 2001).

<sup>13</sup> Thus, only a part of GRW funding consists of subsidies. Whether infrastructure investment should be considered a subsidy can only be decided on a case-by-case basis. Infrastructure investments are traditionally more strongly financed by sectoral ministries (transport, education etc.), which had to take into account support areas of regional policy, however.



assistance is that goods and services must be exported outside the region (at least 50% of turnover beyond a radius of 50km, “primary effect”), whereas the endogenous development potential of the region is only of secondary importance. In addition to the economic eligibility criteria, projects supported must officially be in accordance with a number of “negative restrictions” put forward by land use planning, building and environmental regulations (Karl and Ranné, 2002). In general, however, the GRW is not oriented to explicitly take ecological aspects into consideration.

The GRW can be characterised as a multi-lateral and multi-tiered decision-making system with considerable impact on the design of programs, the programming and evaluation procedures and the overall co-ordination of activities within regional policy. Due to the high need for consensus to keep such a system viable, decision-making is highly segmented in partial decisions of limited scope along the policy cycle (Scharpf, Reissert and Schnabel, 1976; Ast, 1999).

Regarding policy formulation within the GRW a major role is played by a planning committee, which consists of representatives of the federal and the Länder governments (with equal voting power). In multilateral negotiations the Committee principally decides on the total amount of support and the financial allocation to the various Länder (key benchmarks or so called *Eckwerte*). In general the Länder ministries and the Federal Ministry of Economics draft framework plans and restrict the use of funds based on the fundamental criteria already mentioned (primary effect etc.). Studies have shown that vertically linked ministries with the same function (*Fachbruderschaften*), in this case the federal and Länder ministries of economics, have largely monopolised and dominated decision-making even during policy formulation, i.e. the set-up of key benchmarks (Scharpf, Reissert, Schnabel, 1976; Ast, 1999). Decision making is therefore characterised by the mode of negative co-ordination whereas horizontal co-ordination between various spatially relevant sectoral policies is discouraged by inflexible institutional rules and organisational constraints.

Some horizontal co-ordination at least takes place during “programming” at the Länder level. At this stage the Länder decide quite autonomously on those measures that put key benchmarks in concrete form. This allows for some co-ordination on lower levels (e.g. in cross-sectoral working groups) and for some input from non-governmental stakeholders. Traditionally, however, these activities are highly fragmented in Germany and sectoralised ministries represent bottlenecks for more extensive forms of positive co-ordination and policy integration. Thus, regional planning activities are only very loosely coupled with the GRW, both on a conceptual level and in program implementation. Due to the fragmentation along the policy cycle, controlling and evaluation activities were also quite weak and/or differed considerably between the Länder and regions. Up until the 1990s “evaluations” amounted mostly to securing the “proper” outflow and use of funds (*Vollzugs- und Verwendungskontrolle*). Output evaluations to determine the level of goal attainment of regional policy measures developed in the 1970s and have been refined since then. Although external research gained in importance (Toepel, 2000), most of the time an implicit and rather intransparent form of evaluation prevailed within the political-administrative system.<sup>14</sup> Impact analyses are rare, however. As a consequence, considerable uncertainty about impact patterns of regional support policies exists.

Overall the GRW has established a number of co-ordination mechanisms which have repeatedly been the subject of detailed empirical studies. Critical assessments and proposals for improvements from academia and consultants as well as changing economic circumstances have therefore led to various modifications. For example, some service sectors have been eligible for support (Hoppe and Voelzkow, 1999). Despite this, changes were incremental and no basic reform took place in the 1970s and 1980s. Due to the complexity and the sensitivity of the GRW deci-

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<sup>14</sup> A complex array of indicators mainly serves to (re)delineate the area of support without putting into question further need for support. See Lammers and Niebuhr (2002) for a more detailed description and a discussion on the methodological problems involved.

sion-making system a distributional orientation prevailed creating the impression that everybody would benefit from public support. Equity issues were then often postponed or “solved” by injecting new funds into the GRW, by extending eligibility criteria or by creating special programs for those regions that were no longer eligible for GRW support.

However, starting in the mid-1980s the GRW lost its co-ordination function within regional economic policy somewhat. This resulted from the increasing influence of the EU-level following the process of European integration, on the one hand, and changing problem structures at the regional level, on the other hand. These developments provided opportunities for environmental agenda-setting.

#### Reform stimuli and opportunities for greening

German regional policy has been increasingly influenced by EU regional policy since the mid-1980s. The structural funds – consisting of the European Regional Development Fund (ERDF), the European Social Fund (ESF), the European Agricultural Guidance and Control Fund (EAGGF) and the Financial Instrument for Fisheries Guidance – have not only increased in volume. The European Commission has also followed a different and increasingly ambitious approach in programming, implementing, evaluating, documenting and controlling funding activities (multi-tiered program planning).

The programmatic approach developed as a result of the reform of the structural funds in 1988. The reform not only tied together different funding sources and set up multi-annual program plans, but developed new principles and co-ordination mechanisms which gradually gave more weight to sub-national and regional stakeholders.<sup>15</sup> Whereas national governments have for a long time occupied a monopolistic position as to the use of regional funds co-financed by the EU, the reform promoted multi-lateral arrangements which operate vertically on three levels of government and include regional stakeholders (principle of partnership). On the one hand, this opened up new funding sources for the German Länder looking for co-financing of their own regional programs. On the other hand, the European Commission gained more influence in policy and program-making at the level of Member States and steadily exerted “soft” pressure on Member States to align programs with European procedures and policies. New alliances have especially been built between the European Commission and stakeholders from the German Länder. An interesting implication of these alliances (and critical assessments from scientists and NGOs) was that funding patterns at German national level were called into question and contrasted with European criteria for support. The ERDF in particular covered a broader funding spectrum beyond the traditional concept of German regional economic support policy (primary effect, focus on industrial investment etc.). More actively than at the German national level the Commission tried to advance the regional policy agenda and overcome bottle-necks of regional development by activating synergies with sectoral policies (e.g. transport, housing, education policy). Bottle-necks do not necessarily consist in traditional “investment gaps”, but depend on specific regional circumstances and endogenous development potentials (Reissert, 2004). Thus, in contrast to the German GRW the Commission put more emphasis on regional development programs which allow for the regions to identify restraints for regional development. The greater flexibility amounted to a broader funding spectrum, including e.g. infrastructure investment, research and development and “soft” location factors like environmental protection.

As a result, environmental concerns have steadily gained in importance in the structural funds at the European level (Lenschow, 2002, Kraack et al., 2001; EPRC, 2001). Earlier than in Germany funding for environmental purposes became an important component of regional policy at

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<sup>15</sup> For a more extensive treatment of the history of European regional policy and its multiple implications, see, e.g., Ast (1999); Reissert (2004).

the European level (e.g. in the ERDF). Apart from these more direct and immediate environmental implications, the EU programming approach steadily strengthened the legal basis for environmental protection in Structural Funds Framework Regulations and established (environmental) sustainable development as a horizontal program objective in 1999. Art. 12 in particular calls for coherence of programs with other community policies and explicitly mentions environmental protection. For the preparation of Regional Development Plans, Member States are obliged to provide an appraisal of the state of the environment in the region and an evaluation of the expected environmental impacts. Member States are also asked to involve environmental authorities in plan preparation and implementation.<sup>16</sup> More recently, the Directive on Strategic Environmental Assessment – which builds on prior forms of assessments (also for the structural funds) – further strengthens the need for environmental assessment at the “higher” level of plans and programs.

The European programming approach also differs from the German national approach as it puts more emphasis on planning procedures and processes. As indicated above programming at the Länder level within the GRW is traditionally restrained by policy formulation and restrictive funding criteria. Also, evaluations, in particular impact analyses, are only conducted to a limited extent and with a narrow focus. The European Commission in turn has adopted an approach which pays attention at all stages of the programming cycle (i.e. strategy, design, project generation, appraisal and selection, monitoring) and links programming with evaluation.<sup>17</sup> Over the years the Commission created various inter-regional networks and expert and working groups, provided methodological guidance and tried to stimulate learning processes. More and more, guidance, training and awareness-raising extends to complex horizontal themes, like environmentally sustainable development and gender issues (ECPR, 2001). By now, the amount of evaluations and the information gained on the environmental implications of the structural funds is not only considerable (e.g. ECOTEC, 1999; GHK et al., 2002). Research has also contributed to bridging conflicting approaches of program evaluations (top-down vs. bottom-up, model-based vs. indicator-based, quantitative vs. qualitative etc.).<sup>18</sup> The European Commission may therefore be considered a driving force in promoting a “culture” of monitoring, evaluation, transparency and reflexivity. At the same time, Member States have been put under pressure to adopt a more pro-active approach in evaluation. Indirectly, this calls into question the traditional German institutional structures, in particular the vertical and horizontal administrative linkages, and provides opportunities for greening subsidy structures.

In Germany adaptation pressure “from above” has triggered a number of changes. Many of these changes originate from the local, regional and Länder level and also result from the specific forms of multi-level governance in regional policy, especially between the European and the regional level. The “regionalisation of structural policy”<sup>19</sup> which set in at the end of the

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<sup>16</sup> Structural Fund documentation includes Regional Development Plans (RDP) on top of the planning hierarchy, followed by single programming documents (SPD)/community support programs (CSPs) and Operational Programs for implementation. In reality, SPDs/CSPs – which are the basis for fund approval by the European Commission – are to some extent the result of both RDPs and OP, as only the latter allow for a reliable estimation of the costs involved.

<sup>17</sup> As a result of the apparent need for evaluation, evaluation activities increased five-fold in the period 1994-1999, compared to the previous period, fostering considerable capacity building (Toepel, 2000).

<sup>18</sup> The study of GHK et al. (2002), for example, which is based on the so-called four-capital approach, combines case studies, indicators and a macro-economic model. Results show, among others, that indirect environmental impacts matter and that environmental gains are sometimes over-compensated by growth effects (e.g. in the transport sector).

<sup>19</sup> This term indicates that regions are more strongly integrated in the decision-making process, which usually take place in the local or Länder jurisdictions.

1980s was a response to quickly changing problem structures at the regional level. Increasing economic integration within the EU and increasing national and international competition to attract mobile investment capital fundamentally changed the framework conditions for many regions. At the same time problem structures differed substantially between regions (e.g. co-existence of regions with declining industries, border regions along the former “iron curtain”, regions marked by sectoral technological change). Therefore regions did not only create new forms of governance beyond traditional administrative structures and hierarchical policy making, but demanded to decide more independently on the use of public funds at a more decentralised level. At the same time, the approach aimed to strengthen regional stakeholders, improve regional co-ordination processes and develop development strategies based on endogenous potentials within the region. Due to the increasing variety of problem structures, spatial planning and co-ordination mechanisms between various spatially-related sectoral policies were also at stake and gained in importance. These trends led at several times to a partial decoupling between EU funding and GRW funding in Germany (1989 in West Germany, 1995 in eastern Germany).<sup>20</sup> As a consequence, the Länder could exploit the greater flexibility of the structural funds and combine them with their own funding resources. Among others, spending for environmental purposes became a more important component of the regional funding repertoire.<sup>21</sup>

For at least a decade German regional policy has been confronted with more constraints. Three basic framework conditions may be mentioned here, all of which have implications on the use of subsidies:

Firstly, the European Commission has strengthened its regulatory control on subsidies and discouraged its use along with the creation of the internal market. While a number of exceptions are allowed and some room for negotiation exists, Art. 87 of the EC Treaty a priori prohibits any aid granted by a Member State or through state resources in any form whatsoever which distorts or threatens to distort competition by favouring certain firms or the production of certain goods. At the same time, the European Commission has attempted to harmonise its own regional policy and spending programs with its state aid control policy (Karl, 2002).<sup>22</sup> For the Member States this trend does not only create pressure to align national/regional funding with EU regional policy patterns, but also to develop further alternatives to traditional forms of subsidisation. Traditional capital-intensive investment grants are less likely to pass state aid control than less intrusive subsidies, e.g. for education and training, and broader strategies and instruments aiming at the promotion of endogenous development potentials.

Secondly, ever more pressing constraints relate to budget and financial policy. The scope of action has been continuously restrained over the years. On the one hand, EU funding in eligible German regions will be further restricted and concentrated in 2007 as a result of the enlarge-

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<sup>20</sup> Decisions were accompanied with a considerable amount of conflict (Ast, 1999; Reissert, 2004). At the national level and in some Länder, the ministries of economics opposed decoupling. They argued that funds needed to be concentrated for growth-enhancing industrial investment and procedural complications should be avoided. For this reason and for the sake of administrative simplicity, EU funding in eastern Germany was first entirely coupled with the GRW.

<sup>21</sup> It needs to be stressed that the Länder always operated their own spending programs independently of the GRW. The loosening of the co-ordination function of the GRW was an opportunity to re-direct funding for environmental purposes, however.

<sup>22</sup> We do not deny a need for reform in European regional policy nor in European state aid control. We do not explicitly deal with many further implications, however. Instead we assume that state aid control will remain an important restraint for regional policy at the national level.

ment of the European Union.<sup>23</sup> On the other hand, public accounts in general are in a miserable state, which creates increasing difficulties to meet “external” criteria (Stabilisation and Growth Pact) and follow a path of fiscal sustainability. Under these conditions a strong pressure exists to put less strain on public budgets and rely less on spending (like subsidies) as a public policy instrument.

Thirdly, it is increasingly recognised that the state has lost some of its steering capacity in regional policy as a result of more globalised economic structures. The traditional top-down model together with its distributional motivation for funding, of levelling out disparities between regions, has proved less effective. On the one hand, economic decisions are made in a more global and flexible environment and decisions can be revised more easily, on the other hand regions often differ too much in their “natural” endowments (Rosenfeld and Heimpold, 2004). The regions (or regional economies) themselves enter more and more in competition with each other and become arenas of collective decision-making. In this setting financial redistribution between the Länder is more contested by the richer Länder. At the same time, there is a need to create more integrated and region-specific strategies, to stimulate activities at a decentralised level and to use policy instruments that allow for more self-sustaining economic structures (Hoppe and Voelzkow, 1999).

Under these basic framework conditions innovative strategies and activities have developed at the regional level for a decade or so which have often considerable implications for a discussion focused on subsidies and their environmental linkages. They are by nature very diverse, and comparisons between regions, Länder or local communities are hard to make.<sup>24</sup> Nevertheless, we think that the following changes provided opportunities for EPI.<sup>25</sup>

1. the increasing importance of networks and process innovations in regional policy
2. the greater appreciation of environmental issues on the agenda of regional policy actors
3. EU-driven attempts at strengthening evaluation activities and capacity-building in regional policy.

Ad 1) Based on quickly changing problem structures (especially structural crises in the coal industry, employment losses and the failure of traditional top-down policies to alleviate these problems) North-Rhine Westphalia (NRW) was the first German Land to implement the “regionalisation of structural policy” on a broad basis. Regional conferences, working groups and “future initiatives” have been set up to investigate new regional development potentials, reach a broad consensus on strategies, programs and necessary policy measures and to better co-ordinate activities related to regional and structural policy. These initiatives relied on broad-based stakeholder participation to facilitate the set-up of regional development concepts. Various attempts and experiments have been made to improve co-ordination mechanisms and make

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<sup>23</sup> A similar process has already taken place within Germany after reunification to account for the poor economic conditions in the eastern German Länder). After 2007 the GRW is likely to substitute for some EU funding, but overall funding will probably decline which has implications on the distribution of funds (e.g. between eastern Germany and NRW) (Schrumpf, 2004).

<sup>24</sup> There are some attempts in the literature, using the concept of benchmarking and best (or good practice). Often the amount of intervening variables is so big that the use of these studies is limited, however.

<sup>25</sup> For the bottlenecks see the next subsection.

use of synergies (Giese, 2002).<sup>26</sup> This includes horizontal co-ordination between local jurisdictions as well as between ministerial departments and policy sectors (e.g. by setting up inter-ministerial committees), vertical co-ordination between regions and local or Länder jurisdictions and co-ordination with and between non-governmental actors. These experiments were based on the idea that economic, social and ecological problems could only be managed with a joint effort of all relevant stakeholders. Thus, various networks have been set up that accompany and frame the policy making process. Obviously these experiments contrasted with the usual patterns of subsidisation (horizontal and vertical separation, little input from stakeholders other than the subsidy recipients and their representatives). Accordingly, the use of subsidies, their role in the policy mix (e.g. in relation to “softer” instruments like counselling, information campaigns, marketing) and their implications were not only discussed in closed policy communities and ministerial departments but in broader network structures. At the same time, structural policy consisted less in “one-time decisions” on the use of certain policy instruments (like subsidies for private investments), but was embedded in a broader process perspective. This perspective paved the way for continued interaction and learning.

Ad 2) Traditional German regional economic policy (via the GRW) considers environmental protection mostly as a cost factor that hampers economic growth. The GRW stipulates at least compliance with environmental protection laws and other “negative restrictions” to reduce negative repercussions of economic growth.<sup>27</sup> More recently, it treats environmental protection as an add-on in its funding schemes. The GRW, for example, provides funding for infrastructure investments in the fields of water supply, waste-water and waste disposal as well as clean-up and decontamination of contaminated sites to stimulate economic growth and realise positive environmental side-effects at the same time.

This somewhat restrictive concept has especially been transformed at the regional level over the years. A better understanding of local and regional conditions and problem structures have encouraged regional policy actors to identify activities that exploit the simultaneous improvement of environmental conditions and economic development. Often this search for simultaneous improvement results from networking activities between various stakeholders. Typically, synergies have more often been realised by emphasising “soft” factors rather than investment in real capital and infrastructure. Funding activities at the regional or local scale aim more often at improving environmental quality by enhancing the attractiveness of the region as a place of residence, location for business and tourism activities. This in turn may create employment opportunities and income and diversify economic structures. In Mecklenburg Western Pomerania, for example, linking economic reconstruction with environmental conservation and nature protection has been identified as an issue of high priority (MR et al., 2003, pp. 103). At the regional level it is also easier to tailor regional policies in such a way that environmental goals help firms realise competitive advantages (Karl and Ranné, 2001). Including stricter environmental standards or requirements into funding provisions may “force” firms to be more innovative. This may result in better-performing or higher-quality products or production processes with higher resource productivity.

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<sup>26</sup> The international exhibition “Emscher Park” (Internationale Bauausstellung Emscher Park, IBA) is often quoted as one of the successful initiatives. It has already adopted the concept (*Leitbild*) of Sustainable Development. A number of projects also demonstrate that environmental aspects played an important role (e.g. the set-up of a solar power plant in a region that has a long tradition in exploiting non-renewable resources). For a more recent overview of regional policy in NRW, see Harnes-Liedtke et al. (2004).

<sup>27</sup> This does not imply that “negative restrictions” are effective and actually enforced. These matters are rather relegated to other policy sectors.

Overall, a number of examples illustrate that the environment is more strongly appreciated in regional funding schemes.<sup>28</sup>

Ad 3) Especially those Länder that benefit from the EU structural funds have steadily built up capacities in evaluation. Due to the stronger emphasis on environmentally sustainable development as a horizontal theme (as opposed to the GRW) the environmental implications of projects and activities that have no primary environmental objective or may even turn out to be environmentally counterproductive have received more attention over the years. Looking at the recently published external mid-term evaluations of Operational Programs of the Structural Funds in the so-called Objective 1 areas (eastern German regions lagging behind in development) reveals that cross-sectoral themes like environmental protection are explicitly taken into account (MR et al., 2003; Prognos et al., 2003; IFS et al., 2003; GEFRA et al., 2003; ISW, 2003; Kienbaum, 2003).<sup>29</sup> While assessments on cross-sectoral themes are still in a somewhat preliminary stage as regards methodology and feasibility, they can slowly build upon prior studies (e.g. ECOTEC, 1999) and refine or readjust their approach. Most importantly perhaps, evaluations pose new questions and highlight current deficits. As a result, improvements in monitoring environmental impacts have been made recently, for example (GEFRA et al., 2003, pp. 206, 275). Apart from more technical aspects (and proposals for improvement in methodology) evaluations also shed some light on institutional structures and the implementation process (e.g. on the role of environmental NGO in advisory boards (*Begleitausschüssen*); ISW, 2001).

#### Bottlenecks and trade-offs for greening

In the last section we identified some trends and forces that work towards more integrated approaches in regional policy and that provide opportunities for greening funding decisions. Despite available success stories in “sustainable regional governance” many recent studies still criticise that regional policy doesn’t sufficiently integrate environmental aspects.

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<sup>28</sup> ECOTEC (1999) proposes a measure by measure analysis of the way in which the program budget is split between supporting six different development paths or levels of greening. A distinction is made between (1) contributing to economic growth, without addressing environmental impacts; (2) environmental “clean-up”; (3) environmental infrastructure; (4) adjustment to existing environmental standards; (5) improvement of resource efficiency of existing activity; (6) newer activity using fewer environmental resources. Assignment may prove difficult, however, and normative fallacies may result (e.g. because alternative instruments have not been considered). In this paper we have therefore proposed a different classification (see Section 2 and 4).

<sup>29</sup> These quite extensive reports provide information on single funds (ESF, EFRE, EAGFL) and key priorities (*Schwerpunkte*) as well as on overarching issues like the interplay between funds and cross-sectoral themes. As regards contents, the reports typically include an analysis or update of the present socio-economic and financial situation (sometimes including information on prior evaluations), a description or analysis of the goal system or strategy (coherence, relevance), information on available indicators, an output and – to a lesser degree – outcome or impact analysis, and an assessment of the implementation process (*Begleitsystem*).

This criticism is often directed at the GRW: While it is admitted that the GRW is not as strongly biased towards investments in capital equipment and new land use development as before<sup>30</sup>, it is still criticised that changes are insufficient or only made incrementally and/or after a certain time lag. In this sense, available data also suggest that there is still a high correlation between highly subsidised regions and regions with high growth rates in land use. Surveys also indicate that the GRW has been biased towards development of new land at the expense of waste land recycling (Umweltbundesamt, 2003). Thus, following the evidence, GRW funding seems to be not sufficiently compatible with some environmental quality goals (e.g. the reduction of land use for settlement and traffic infrastructure) and spatial planning requirements and ecological criteria (Umweltbundesamt, 2003; Nischwitz and Nill, 2003; SRU, 1996).<sup>31</sup>

Indirectly, available studies often point to various critical or “weak” linkages that explain why greening approaches often prove difficult.<sup>32</sup>

1. Persistence of departmental perspectives: An important impediment for further policy co-ordination (“positive co-ordination”) and greening results from the persistency of policy communities and the dominance of departmental interests (*Ressortlogik*). While attempts at and experiments with positive co-ordination exist (e.g. regional conferences) issue networks have often dissolved and follow-up has proven difficult.<sup>33</sup> Traditional administrative structures and mechanisms of “negative co-ordination” turn out to be much more stable and provide clearer incentives for their employees (*Fachbruderschaften*).
2. Tiering: Co-operation and communication between levels of government and between regional association and local or Länder jurisdictions is often limited. The governments of the Länder often operate as gate-keepers in decisions related to funding. The principle of partnership and subsidiarity is met only partially (Ast, 1999, p. 193). Other stakeholders at the local or regional level can often only provide input on the design of specific measures without being involved in debates on a more strategic level. Regional development concepts, for example, may in the end only include non-binding and vague statements or provide no conceptual link to operational programs along the “planning hierarchy”.
3. Procedures vs. contents: As a result of pre-structured and institutionalised political and administrative relationships co-ordination (e.g. in inter-ministerial working groups) is still bi-

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<sup>30</sup> In the 1990s the attempt of closing development gaps and making regions competitive on the world market by way of massive capital grants was criticised as “catch-up modernisation” (*nachholende Modernisierung*). It would only lock-in economic structures. Also, funding mechanisms would not promote regional economies but “prolonged work benches” of big firms (outsourcing) without significant regional employment and innovation effects (Dühr, 1998, 93f. with an example from East Germany). Due to various criticism in 1995 (the 24<sup>th</sup> framework plan), the GRW funding was partially extended for so-called “non-investment” purposes which includes mostly subsidies for training and counseling at firm level as well as research and development. Funding for projects which are included in regional development plans are officially prioritised. In the GRW regional development plans were considered as an instrument to “strengthen initiative for regional development at the local level” and to support “development from below more than before”.

<sup>31</sup> However, there is no conclusive evidence on causal relationships. It may well be the case that, due to time lags, observable environmental problems (as measured by indicators) result (partially) from funding decision that date back a long time. Current funding criteria may better reflect ecological sustainability concerns.

<sup>32</sup> For a broader discussion on the predicaments of “meso” policy, see also Meyer-Stamer (2000, 2001). For a closer look at the weaknesses within the GRW, see Nischwitz and Nill (2003).

<sup>33</sup> Referring to experiences with regionalised structural policy in NRW Meyer-Stamer (2000, p. 31) calls this the predicament of self-destructive subversiveness.



- ased towards securing the outflow of funds (*Mittelabflusslogik*). Thus, there is less room for discussing trade-offs and critically assessing the results of evaluations.<sup>34</sup>
4. Links between networks, fragmentation: As sketched above numerous networks have been established in regional policy over the years and supplemented traditional politico-administrative steering mechanisms. However, these networks often co-exist, with each focusing only on more or less isolated issues. A narrow focus may create externalities (e.g. environmental externalities) due to lack of information, awareness or lobbyism.<sup>35</sup> This leaves the question of how to co-ordinate multiple networks with multiple stakeholders (network management).
  5. Links between the short and the long term: The principle of Sustainability calls for a long-term orientation, clear priority setting as well as continuous improvements with regard to the ecological modernisation of our economies, but also with respect to creating sound public accounts and adapting to changing demographic structures. The political economy of reforms make short-time adjustments and short-time crisis management often more attractive, so that sight is lost of long-time priorities. Given the constraints of election cycles and the presence of visible and powerful private interests, environmental stakeholders may have difficulties in being heard (or even organised).

Overall, regional policy has turned into a highly complex policy field and may be conceptualised from quite different perspectives. The emergence of multi-level policy structures have contributed to this complexity. Not only the number of actors has increased considerably. Regional policy is also confronted with demands from stakeholders with very different goals.

Broadly speaking, two strategies for further greening subsidy structures and support infrastructure might be distinguished:<sup>36</sup>

Following the first strategy, diversity and complexity is not only considered a challenge, but an opportunity for learning and innovation (Schleicher-Tappeser, 2001). Thus, according to this view, the flexibility which has become typical for policy-making at the regional level can help to make policies more complementary and to create “increased coherence”. The principle of subsidiarity plays an important role here: In contrast to centralised steering mechanisms policies should be developed bottom-up from the lowest possible level with sufficient potential for local experimentation. At the same time, the interplay between levels of government (or rather governance) and different scales and cycles (e.g. ecological scales and material flow cycles) is emphasised. In this rather dynamic and fluid environment the formulation of clear policy objectives on each level of governance is important (with objectives at lower levels being more concrete than objectives at higher level). Policy objectives then allow for more transparency and facilitate evaluation activities. Evaluation in turn can be characterised as an instrument for communication, it brings forward new ideas and perspectives and feeds back into policy formulation. Thus, it is hoped that current capacity-building in evaluation of regional programs can contribute to further strengthen the principle of sustainability in regional policy and to promote learning. Typically then, evaluation should not so much help to mutually avoid negative repercussion of regional programs in one dimension of sustainable development (e.g. negative environmental effects of subsidies). Evaluation should rather help to bring together different dimensions and

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<sup>34</sup> This problem is also related to perverse incentives in centralised funding schemes: Regions that are funded from a central body and use these funds in an intelligent way risk being excluded from funding in the next funding period (Meyer-Stamer, 2000). If funding decisions are subject to a competitive process with clear quality standards, these problems may be somewhat alleviated.

<sup>35</sup> This tendency may become more pronounced as economic support policies get “privatised” (Meyer-Stamer and Giese, 2004).

<sup>36</sup> For a proposal on the future of the GRW that comprises elements of both strategies considered here, see Nischwitz and Nill (2003).

policy goals at an early stage and encourage co-operation between stakeholders. Indirectly, this approach would make it less likely that regional programs go along with environmentally harmful side-effects in the future (pro-active integration).

The second strategy emphasises more strongly that complexity may promote centrifugal forces of fragmentation. Therefore an array of tangible and intangible transaction costs has to be accounted for, like the cost of co-ordinating different stakeholders, the cost of knowledge “transfer” or the cost of motivation. Typically these costs increase dramatically with the amount and the diversity of stakeholders and worldviews as well as the rigidity and complexity of the situation. It may therefore be an illusion to reach a viable consensus given the diversity of regional network structures. More “top-down elements” may therefore be needed for greening in regional policy. Environmental concerns might be integrated more successfully in regional policy by improving the co-ordination between regional policy and various spatially relevant sectoral policies (Umweltbundesamt, 2003). For example, the elimination of transport and housing subsidies (like the distance allowance in the income tax [*Entfernungspauschale*] and the homeowner support scheme [*Eigenheimzulage*]) would counteract the trend against sub-urbanisation and could strengthen regional economic cycles. Moreover, “positive prices” (or higher or less distorted positive prices) for the environment (e.g. via a fossil-fuel tax) may act as “ecological guard railing” (*Leitplanke*) and favour production and marketing of regional products and renewable raw materials. Thus, as the broader conception of regional policy comprises linkages to e.g. energy and transport policy, new policy instruments associated with these sectors (like user charges for HGV, tradable land-use permits) may help to realise regional policy objectives and create positive (side-)effects on the environment.<sup>37</sup>

### 3.2 Energy policy

#### Definition and overview

Energy policy is an old policy field. Many of its origins can be traced back to pre-war times, and these origins have shaped post-war energy policy and have only slowly been transformed more recently. Many of the cornerstones of German energy policy relate back to the Energy Industry Act of 1935, which basically remained in force until 1998: Energy industry structures were organised in a highly centralised way and big private energy supply companies (*Großverbundwirtschaft*) and public authorities were tightly intertwined (Hennicke, 1990). While the local level gained in importance after the war, the basic structures did not change and the close congruence between “public” and private interests prevailed. The law against restraints on competition considered the energy sector as a special sector and justified the existence of regional monopolies. Thus, the “special characteristics” of the energy sector<sup>38</sup> guaranteed considerable profits for electricity and gas supply companies with little or ineffective control mechanisms.

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<sup>37</sup> Further links that could be strengthened relate to planning instruments (spatial and regional planning vs. sectoral planning). In the wider sense, linkages to the reform of the German fiscal constitution can be explored. The current system is often criticised for being highly intransparent and for promoting the externalisation of cost components on other levels of government or third parties. The GRW has always been part of this criticism, but has not been fundamentally reformed so far.

<sup>38</sup> This touches primarily on three lines of argument: Firstly, due to the high capital intensity and to the stabilisation of electricity demand resulting from the mix of supply areas, the monopolies are economically advantageous. Secondly, because electricity cannot be stored, security of supply is only to be guaranteed by monopolies. Thirdly, the energy industry is charged with the implementation of political objectives (obligation to connect and supply, purchase of coal etc.) (see VDEW, 1989). These reasons were for a long time not put into question.

As a result, energy policy had a very narrow focus and was only considered a component of sectoral economic policy. Economic policy in turn was long oriented towards promoting quantitative growth. Accordingly, it was thought that primary energy consumption is inseparably connected with GDP growth, and possible “side-effects” of energy consumption could be neglected. National energy policy was almost entirely oriented toward energy supply (that is energy carriers and related technologies) and followed the guidelines that were set up in the Energy Industry Act: Energy was to be provided as securely and cheaply as possible (“*so sicher und billig wie möglich*”). Power generation and transport capacities in big fossil-fuel based and nuclear power stations needed to be expanded to close “energy gaps” (*Energielücken*) and provide “desired supply” (*bedarfsgerechtes Angebot*).

Over the years, however, numerous inter-linkages to other policy fields have transformed and redefined energy policy.<sup>39</sup> Inter-linkages have especially been created with research and technology policy first, and more recently energy policy is closely inter-related with competition policy, financial policy, environmental policy, foreign policy and development policy. These inter-linkages have given rise to a change in, and mostly an extension of, policy objectives and building blocks that constitute modern energy policy. Not surprisingly, changes also relate to instruments and steering mechanisms (or strategies) used in energy policy. The next section follows these changes by focusing on the case of coal and the instruments of “coal policy” (Mez, 1998; Saretzki, 2001; Storchmann, 2004).

#### The role of subsidies: the pivotal position of hard coal

In German energy policy the use of subsidies has for a long time been associated with hard coal, a non-renewable resource which is quite abundant in Germany. Focusing on this sub-segment of energy policy along various historical stages may therefore highlight many typical patterns of subsidisation within energy policy.

The coal, iron and steel complex, highly concentrated in the Ruhr and the Saar region, symbolises the rapid development of German industry that can be traced back a long way to the 19<sup>th</sup> century. After World War II the mining sector expanded rapidly with an increase in production from 38.9 mt in 1945 to 151 mt in 1956. This substantial rise in coal production was considered as one of the primary reasons for Germany’s quick economic post-war recovery and subsequent growth and prosperity. However, it was strongly induced by political intervention.

Focused entirely on German coal in the post-war period, national energy policy was meant to help overcome material scarcity. To meet the rising energy demand and alleviate social hardships after the war, hard coal prices were regulated and fixed below the market price, and several policies were put in place to boost coal production even further (e.g. by putting restriction on oil-fired power plants). In the end, coal had to be apportioned due to excess demand.

From 1958 on a downward trend in coal production started that still continues today. The year 1958 was marked by the “coal crisis”. This crisis was to a large extent due to the increasing price disparities between coal and competing energies on the world market.<sup>40</sup> On the one hand, it turned out that Germany’s deep deposit production sites were more expensive to operate than open-cast mines (e.g. from the U.S.) so that imported coal steadily gained a competitive advantage in price over the years (also due to decreasing transport costs).<sup>41</sup> On the other hand, the

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<sup>39</sup> Interestingly, Saretzki (2001, p. 197) suggests that energy policy has only become a full-blown policy field in the 1970s after the “energy crises”.

<sup>40</sup> Before 1958 German authorities also had to give up price regulation to address excess demand. Production capacities increased as a result. In conjunction with substitution competition from other energy sources there was eventually excess supply on the coal market.

<sup>41</sup> In 2002, the price of domestic hard coal was approximately €150 per tce compared to a price of below €50 per tce for imported coal (Storchmann, 2004).

price difference between coal and oil widened considerably and structural change and technological innovation (especially in the petrochemical industry) made oil-based products (like plastics) more convenient and attractive than coal-based goods (like steel).<sup>42</sup>

From the late 1950s on coal policy (“coal priority policy”) aimed at restoring competitiveness to the domestic mining industry, securing sales markets, and limiting social and regional hardships in the mining areas. Most of these policies were based on the assumption that (market-induced) downward trends for German coal production could be stopped or reversed politically,<sup>43</sup> or that German coal needed to be a vital component of the national energy mix. To reach these various objectives, coal policy has heavily relied on subsidies, often in conjunction with regulations and command and control instruments.<sup>44</sup> From 1958 to 2002, a total of 58 different measures totalling €157.7 bn. can be distinguished, which mostly qualify as subsidies (Storchmann, 2004 with a very helpful overview). Due to the sheer amount of programs it is difficult to clearly sort out their objectives. Yet, programs often seem contradictory and inconsistent. For example, programs that aim at boosting coal production were not always abandoned after a crisis and premiums for closures of collieries were paid at the same time.<sup>45</sup>

The most important single program with an overall subsidy volume of €37.2 bn. was the “coal penny” (*Kohlepfennig*), which was introduced in 1975 after the first oil crises and abolished in 1995. Levied on consumer electricity prices its function was to subsidise the coal inputs fixed in the so-called Century Contract (*Jahrhundertvertrag*) via a compensating fund (*Ausgleichsfond zur Sicherung des Steinkohleneinsatzes*). The *Jahrhundertvertrag* was a long-term government brokered sales agreement between coal mines and electricity utilities, “obliging” the latter to use target quantities of coal input for electricity generation. Basically, this contract made the relationship between the mining industry and the power sector more stable and calculable; it was an instrument for embedding commitments. Since the contract relies on the smallest common denominator to reach consensus among the parties involved, it indirectly strengthened the existing oligopolistic market structure and interest constellations (and consequently excluded third party interests, like those related to environmental protection) (Jakli, 1990, p. 282).

The use of subsidies reflects some of the changing patterns in energy policy. During the oil crises in particular coal gained in acceptance and policy-makers offensively backed up coal. As slogans like “away from oil” and “priority for coal” indicate the government aimed “to secure the basis of coal mining to strengthen it for its present and future role in energy provision and to exempt it from consequential costs (*Folgekosten*) of the past recession” (BMF, 1977, p. 23).<sup>46</sup>

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<sup>42</sup> As a result the sales structure of hard coal changed considerably over the years: The heating market (households, industry) has become less and less important (70 mt in 1957, 0.5 mt in 2002), the steel market has lost as well (7.5 mt in 2002) but kept an average of 20-30 mt between 1960 and 1990, power generation in contrast has increased (20 mt in 1957, 40 mt in the mid-1980s, 23 mt in 2002). At the same time, these developments result from the specific “coal priority policies” (see below).

<sup>43</sup> It turned out later that the downward trend could only be interrupted by short periods of stagnating or slightly growing production.

<sup>44</sup> Subsidies have typically been push policies aimed at lowering the cost price of domestic hard coal, or ease the adjustment process. Pull policies by contrast have attempted to impair or prohibit usage or import of competing energies (e.g. heating oil taxes, ban on large oil and gas-fueled power plants).

<sup>45</sup> Storchmann (2004) differentiates between sales aids (€15.7 bn.), social aids (€19.6 bn.), structural aids (€1.1 bn.), decommissioning aids (€6.0 bn.), and R&D aids (€5.2 bn.) and gives detailed accounts for each year (1958-2002). Sales aids peaked in 1989, social aids were important after the “coal crisis” of 1958, and structural, decommissioning and R&D aids were highest from the mid-1970s to the early 1980s.

<sup>46</sup> Energy “demand” forecasts (*Energiebedarfsprognose*) at the end of the 1970s suggested that energy consumption would grow substantially until 2000. Later it turned out that this forecast overestimated demand by 30%. Nevertheless, these estimates left their mark on policy decisions, investment planning, R&D etc. (Kübler, 1999).

At other times coal policy was more defensive, trying to ease worker tensions, decrease the number of miners in a socially acceptable way or defray costs of mine closure without giving up the objective that Germany needed a high level of national coal in its energy mix. More defensive phases were often accompanied by structural change in favour of cheaper energy sources (e.g. oil in the late 1960s) and pressure from industry to allow for a broader use of these cheaper energy sources.

Trade-offs between the primary objectives of energy policy – inexpensive supply and security of supply – could never really be solved which led to “policy dilemmas” (Horn, 1977, p. 260) and created the impression that energy policy was undetermined and inconsistent. A typical way of dealing with conflicts, particularly in the late 1960s and early 1970s, consisted in the creation of concerted action programs (*Konzertierte Aktion Kohle*) and (later on) “coal rounds” (*Kohlerunde*, 1995). Following the corporatist tradition in Germany these initiatives involved representatives of the federal and the Länder governments, the coal and energy supply companies and the unions, and aimed at reaching as much of a consensus as possible. As a result, economic adjustment problems were often not clearly “solved” but pacified politically (Saretzki, 2001, p. 204). Again, there was little room for innovation and few opportunities for other stakeholders to get involved in the decision-making process. Following Grabher (1993, p. 264) “the highly cooperative relations between industry and the politico-administrative system petrified to a preperestroika culture of consensus. For decades, this culture, shaped by rather conservative social-democrats, conservative unions, and patriarchal industrialists, remained unchallenged”.

When environmental issues became more important in the 1970s (and in the 1980s with the “*Waldsterben*”), coal policy wasn’t fundamentally questioned either, although mining, energy conversion and use of fossil-fuels has serious environmental implications (SRU, 2000, p. 499ff.). Compared with its substitutes, emissions of particulates, dust, sulphur dioxide, nitrogen oxides and greenhouse gas emissions per unit of usable energy are typically higher. Not only coal consumption but mining itself is resource-intensive (use of land, materials, water; relocations) and causes a large number of local and regional environmental burdens (unusable waste land, waste water, change of groundwater table, water pollution, impairment of landscape and ecosystems, change of relief). To counteract (or rather alleviate) these problems subsidy programs were at least devoted to environmental investment. NRW granted structural aids to limit pollution, noise, and agitation between 1969 and 1990 which amounted to €74.1 mn., for example. A more substantial amount of aid fell under the category R&D.<sup>47</sup> Typically, these aids were accompanied by the introduction of command-and-control policies, like (stricter) emission standards in the power plant sector. Thus, over the years there has been an internationally unparalleled lowering of classical pollutant emissions achieved especially through flue gas treatment and dust removal installations.

From the point of view of environmental policy, these measures qualify as add-on or end-of-pipe: They leave prevailing production and consumption patterns intact and only provide marginal incentives for environmental improvements along predefined technology paths (that is, not along new paths). Actor constellations also remained more or less the same: Programs were administered by the Ministry of Economics or the Ministry of Research and Technology and in

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<sup>47</sup> Several programs (especially from the federal government) promoted R&D for environmentally friendlier and more efficient usage of hard coal and new mining technologies totalling approximately €1.8 bn. from the mid-1970s to the mid-1990s. Another €190.0 mn. were granted from 1975 to 1991 for mining and carbonisation technology, improvement of working conditions, and environmental protection more generally.

close co-operation between the Federal Government and the “coal-Länder”. However, these approaches document that environmental issues slowly gained importance in energy policy.<sup>48</sup>

### Reform stimuli and opportunities for greening

As indicated above and symbolised by the amount of subsidies “coal policy” was often given priority in German energy policy in the first decades after World War II. While this has never remained unquestioned (e.g. by industry asking for cheap energy), some basic framework conditions have only changed more recently which in turn affect the coal sector and coal subsidies (Mez, 1998; Kübler, 1999; Matthes and Cames, 2002).

First of all, energy policy has been increasingly influenced by the international debate on climate change. Here it has become more and more obvious that a business-as-usual continuation of existing energy policy with its strong focus on the supply side of the energy market and its restrictive set of objectives (“as securely and as cheaply as possible”) was no longer adequate. As global climate warming has steadily become more firmly embodied in public and political awareness as a pre-eminent problem area, it also became more evident that a more fundamental restructuring of our economies in general and the energy markets in particular needed to take place in order to be less dependent on non-renewable resources and to drastically reduce the emission of greenhouse gases. Thus, as for environmental issues energy policy had to extend its perspective which was until the mid-1980s strongly concentrated on the level of individual (power) plants and the reduction of “classical” air-borne pollutants (like sulphur dioxide or nitrogen dioxide). For coal the emergence of the climate change issue obviously poses considerable challenges: In comparison with gas and renewable energies coal has a higher content of carbon dioxide, coal-based power generation is technically rather inefficient, and further greenhouse gases result from coal burns and the remediation of the consequences of coal extraction. At the same time, typical end-of-pipe technologies are not easily available or applicable.<sup>49</sup> Thus, climate change requires to reduce the percentage of coal in the energy mix.

Climate change has not only extended the set of objective in energy policy and given environmental concerns an ever more prominent place therein. Over the years Germany has become an international forerunner in climate policy and stimulated agenda-setting (e.g. with its ambitious proposal in 1990 to reduce CO<sub>2</sub>-emissions by 25% by 2005) (Beuermann and Jäger, 1996). At the national level this is reflected in a number of innovative activities: Attempts at positive co-ordination between ministerial departments have been strengthened, for example by setting up an inter-ministerial working group. Also, new networks have developed and non-governmental stakeholders (like scientists, environmental NGOs) have gained some access to the policy arena of climate and energy policy, which was for long dominated by a closed policy community (Foljanty-Jost and Jacob, 2004).

Another fundamental challenge for traditional energy policy results from the liberalisation of energy markets that set in at the end of the 1990s. Especially in the 1990s a change of paradigm can be observed with respect to the role of the state in highly regulated energy markets putting into question some of its “special characteristics”. As a result of national experiences (especially in Great Britain) with more deregulated energy markets and the increasing competition on European and international markets it became more obvious that traditional state monopolies and supply structures needed to be re-examined to prevent a distortion of the “level playing field” (Kraack et al., 2001, p. 96). Demands for reform then strengthened the role of the EU in

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<sup>48</sup> For example, the Combustion Plant Act (1983) demanded compliance with emission standards despite of a continuation permit (*Bestandsschutz*) for industrial plants (Mez, 1998, p. 29). This documents that the power of energy supply monopolies was more and more put into question.

<sup>49</sup> We return to this in the next sub-section on bottlenecks and trade-offs.

energy policy and created links to the common market program of the European Commission. Major changes resulted eventually from the opening up of the market for grid-bound energy (electricity and gas) (Matthes and Cames, 2002). In essence, anti-trust exemptions for regional monopolies were abolished and all energy suppliers were allowed to use transmission and distribution networks. A number of new players (e.g. electricity traders, energy service providers etc.) have therefore entered the market and put into question the traditional highly regulated structures in the energy sector.<sup>50</sup> At least initially this led to a fall in prices and most energy supply companies had to accept a slump in profits.<sup>51</sup>

Efforts towards liberalisation were also no longer compatible with long-term contracts between coal mining companies and power plant operators (the Century Contract). Thus, in 1996 coal import quotas were lifted and electricity companies were free to choose their suppliers (e.g. by using cheaper imported coal) (Commission of the European Communities, 2002). At the same time, one traditional argument for subsidising domestic coal – guarantee security of energy supply –, was increasingly called into question. It was argued, among other things, that disruptions in energy imports were unlikely due to the increasing diversification of energy supply sources on the world market. Also, much cheaper options to achieve the goal of security of energy supply were available (e.g. stocktaking) (Neu, 1995; SRU, 2000).

Within the European Commission, DG IV (competition) gained in influence trying to apply EU competition rules to a sector that was traditionally exempt from market competition. As for coal, EU policy on state aid control became somewhat more restrictive and demanded further dismantling of subsidies. Whereas the subsidy approval process within the framework of the European Coal and Steel Community (ECSC) was merely a formality for a long time, decisions in 1993 and 2002 formulated at least additional requirements for Member States and involved a higher level of conflict between the parties involved (Storchmann, 2004).<sup>52</sup>

Overall, liberalisation trends have made it more difficult to justify the use of traditional coal priority policy. Subsidising domestic energy sources that will never become competitive on the world market is obviously not compatible with attempts at the European level to decrease market distortions and create competitive energy markets (Enquete-Kommission, 2002).

The new framework conditions in the energy market and the increasing role of environmental aspects within energy policy have also transformed the traditional supply-oriented policy approach to some extent. Rather than focussing entirely on the energy sector (extraction or import of primary energy, conversion of primary into secondary energy, transport and distribution of energy) and supply technologies (like mining pits, power stations, refineries) the scope of action of energy policy has widened and comprises a more systemic perspective (Kübler, 1999). More

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<sup>50</sup> However, the conditions for market entry were quite unequal among the players and the way markets were opened up created new distortions (see below).

<sup>51</sup> Meyer (2001) considers the monopoly rents granted to regional energy supply companies as an implicit form of subsidisation (or a regulation with subsidy character). The amount of the subsidy is determined by comparing the difference in pricing between regulated and competitive markets. Based on available evidence she suggests that the subsidy amounted to almost €5 bn. in 1998. In principle, the transfer of electric power systems to private ownership should affect fuel choice by increasing the required rate of return on new investments. This would work against capital intensive means of generating power, such as plants based on nuclear and coal, and in favour of less capital intensive plants based on natural gas.

<sup>52</sup> The 1993 regulation demanded to further phased-out subsidies to make progress towards economic viability of coal markets. The Commission also asked Member States to solve social and regional problems created by the reduction of coal activity and help the coal industry adjust to environmental protection standards. More accountability and transparency on the kind of subsidies provided and their financing mechanisms was demanded.

attention is now given to the *demand side*, that is energy consumption and the cost of energy use. On the one hand, this comprises the process of converting primary and secondary energy into usable energy and energy services (heat, light, power, information etc.), including necessary end use technologies (like computers, lamps etc.). This service orientation does not so much involve an increase in physical energy supply. Under the more flexible framework conditions in the energy market more attention is rather given to a better use of available resources and an exploitation of technical efficiency gains. On the other hand (and related to that), it is increasingly being recognised that all along the energy life-cycle (extraction, conversion, use etc.) environmental resources are used and pressure is exerted on the environment. Yet, due to the public good character of the environment the costs involved are often not reflected in prices for energy provision and use, but imposed on third parties (e.g. future generations). As a consequence, it is demanded that these external costs be internalised into decisions related to energy. The Enquete-Commission "Sustainable Energy Provision under the Conditions of Globalisation and Liberalisation" has recently popularised a more *strategic approach* in energy policy to account for these new framework conditions and the increasing diversity in the energy market (Enquete-Kommission, 2002). Following their recommendations, strategies may be seen as long-term concepts for action, which comprise several building blocks and systematically combine basic and policy-specific goals with instruments and concrete policy options. This strategic framework has resulted in

- 1) a review of objectives
- 2) a new alignment between instruments and policy goals
- 3) contradiction monitoring activities

Ad 1) Strategies imply goal-setting. Goal-setting should be based on stakeholder participation and goals should be as clear, action-oriented and consistent as possible. They do not allow for immediate conclusion on instruments but only help to define a corridor within which an adequate mix of policy instruments may be chosen. Goal-setting may help to reinterpret some of the traditional policy objectives in energy policy in light of the new framework conditions (climate change, liberalisation, globalisation). As a consequence, new questions are brought up in the energy policy arena and in future energy scenarios, e.g.: How much can renewable energies and rational energy use contribute to the "traditional" goal of energy security? Does energy security have the same importance as before (e.g. due to attempts at lowering the primary energy consumption in the future)? What are the least costly options for maintaining national security of supply (e.g. production subsidies vs. set-up of reserve capacities)?

Ad 2) A basic distinction may be drawn between instruments that shape the broader framework conditions in the long term and involve more fundamental political decisions (*Richtungsentscheidungen*), and instruments that are designed for more specific policy goals and sub-goals. As a result of the debate on climate change and the liberalisation of energy markets the former instruments have gained in importance. However, they are accompanied by the latter instruments which operate in a shorter time-frame, help to overcome specific obstacles for specific technologies, actors or market segments, and shape less the general framework conditions.

Ad 3) Among the global instruments the Ecological Tax Reform (introduced in 1998 in Germany) and the EU-wide scheme for emission trading (from 2005 on) should be mentioned. In principle, both account for the importance of better integrating environmental aspects into energy policy (and tax policy in case of the eco-tax). By using the global price mechanism both are meant to help internalise external costs and promote environmental structural change. A look at the implementation process reveals that the effectiveness and efficiency of these instruments is limited, however. The traditional privileges for coal in Germany are a case in point: Coal is exempted from the electricity tax, and the tax structure doesn't sufficiently reflect the



carbon content of energy sources, which blocks fuel substitution.<sup>53</sup> Similarly, benchmarks for emission reductions in the trading schemes have been differentiated and tilted in favour of coal (Seiche, 2004). Thus, indirectly the implementation of these instruments, often considered optimal in theory, strengthened efforts at “contradiction monitoring”. Model studies highlight the macroeconomic efficiency losses, for example (Böhringer, 1996): They show that serious trade-offs occur when regional employment objectives are pursued with traditional instruments (like subsidies tied to coal production), while environmental policy aims to promote least cost options to reach climate protection targets (e.g. the Kyoto targets).<sup>54</sup> The implementation of global instruments may also be contrasted with earlier proposals that envisaged stronger burdens on coal as a carbon-intensive fuel (e.g. Meyer, 2001; Neu, 1995). Similarly, case studies may show that strategic orientations in energy policy are often thwarted by powerful lobby groups (e.g. Stadthaus, 2001).<sup>55</sup>

More directly, adaptation pressure to reduce coal subsidies has come from the strain they impose on the public budget. An important stimulus for the reform of coal subsidies occurred in 1994 when the German Federal Constitutional Court declared the largest of all coal support measures, the coal penny (*Kohlepfennig*), unconstitutional. According to the Court this financing scheme contradicted basic principles of the German financial constitution.<sup>56</sup> In addition, the end of the coal penny coincided with the end of the last 5-year period of the exclusive contract between mining companies and power plant operators, the Century Contract.<sup>57</sup> As a result, subsidies of over €7 bn. needed to be included in the public budget and disclosed in the Federal Subsidy Report (BMF, 1995). This opened up a policy window to make more fundamental changes to the coal subsidy system.<sup>58</sup> While there was no decision to phase-out coal subsidies for good, there were at least substantial changes in subsidy design that triggered substantial reductions in aid volumes: Instead of subsidising pre-defined quantities of coal and compensat-

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<sup>53</sup> Another example can be found in the CHP Act, which doesn't sufficiently differentiate according to carbon-intensity of CHP-production (SRU, 2002, Tz. 489ff.). These subsidies do not show up in the Federal Subsidy Report and qualify as implicit subsidies. The term subsidy seems justified: On the one hand, these measures distort the level playing field between energy sources and make it more difficult to reach climate protection goals. On the other hand, they create new privileges in the “normal” tax code.

<sup>54</sup> By restricting the possibilities for substituting carbon-intensive fuels with less carbon-intensive fuels, these welfare losses lead to higher compliance costs in other sectors of the economy.

<sup>55</sup> Subsidies for coal and other privileges for conventional fossil fuels also mirror the difficulties and the amount of “historical distortion” that prevent a more rapid diffusion of renewable energies and efficiency measures. We do not elaborate on this here. For details see e.g. Enquete-Kommission (2002). However, it should be acknowledged that renewables would not automatically and widely diffuse with the abolition of coal subsidies. Conceptually, the removal of environmentally harmful subsidies provides for more transparency on the cost side. Global instruments that follow the polluter-pays principle may then set a positive price for the use of environmental resources. Specific instruments (like subsidies) may alleviate some obstacles for the diffusion of certain environmentally friendly technologies or the creation of new environmentally friendly market segments.

<sup>56</sup> First of all, the levy on electricity prices undermines the law making competence of parliament. Second, financing coal via a separate fund violates the authority of the parliament over the budget. Third, securing energy supply should be considered a public task (*Gemeinwohlaufgabe*) which needs to be financed via the tax system.

<sup>57</sup> As mentioned above this contract was no longer compatible with efforts to liberalise energy markets.

<sup>58</sup> At the same time there were attempts to restrain the coking coal aids (providing domestic coal to German steel mills at the same price as imported coal). While these aids were always covered by the budget, the Federal government aimed to make (further) cuts in the mid-1990s and impose a larger portion of the financial burden on the Länder (see Neu, 1995 for a more detailed discussion).

ing electricity companies (via the coal penny) target ceilings were introduced and a fixed amount of subsidies (deficiency payments) included under these ceilings were passed on to the mining companies. Thus, the amount of subsidies paid was no longer dependent on the difference between import prices and domestic prices but the ceilings agreed upon by the parties and fixed in the budget. Due to budgetary pressure these ceiling have been reduced, tightened and unified over the years.

Subsidies do not only burden public budgets but entail various indirect costs. In this respect, effects on the tax system, that is the welfare loss of subsidies as a result of distortionary taxation, and the administrative costs of running subsidy programs are frequently mentioned. Most of the time it is difficult to actually prove that there is a causal link between a particular subsidy and an undesirable outcome or side-effect, however. Due to the amount of confounding factors negative side-effects, and in this case negative ecological (side-)effects, of subsidies easily get out of sight.<sup>59</sup> As to the German coal industry, which heavily relies on subsidies, ecological consequences of mining have not only become more and more visible and perceptible. Since interference with eco-systems at least partially implies interference with private property rights (especially as a result of the drawdown of the groundwater table and the risk of flooding), public resistance against coal-mining has increased considerably in the mining areas. In NRW, for example, a citizen's group with 2000 members (*Bürgerinitiative Bergbaubetroffener am Niederrhein*) opposes further coal mining in the Ruhr area ([www.bib-nr.de](http://www.bib-nr.de)). As a result, ecological criteria will, for the first time, be considered in future colliery closures (Hustedt, 2004).<sup>60</sup>

#### Bottlenecks and trade-offs for greening

Especially within the last decade there have been substantial changes in German energy policy. Broadly speaking, energy policy is more strongly oriented to the demand side of the energy market. This implies that more actors are involved in energy policy, new procedures and institutional structures are established (e.g. between the EU and the Member States) and new instruments (like eco-taxes, emission trading schemes, feed-in tariffs) are employed. These changes go along with ecological constraints and challenges. The debate on climate change and Sustainable Development in particular has transformed energy policy (Mez, 1998).

Yet, and despite pressure to adapt to changing circumstances, traditional policy patterns and traditional instruments are still used in energy policy. In this respect coal policy is typical. While coal support has decreased in the last decade, no clear commitment to end coal support policies has been made. Even after 2010 further support for coal may be granted.<sup>61</sup> The introduction of the Ecological Tax Reform has also been accompanied with new privileges for coal. Finally, the trend towards market liberalisation in the electricity market has been counteracted

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<sup>59</sup> There are a number of model-based studies that document the environmental consequences of phasing out coal subsidies (e.g. OECD, 1997; Welsch, 1998). In terms of greenhouse gases, emissions may first rise as a consequence of subsidy phase-out, since more coal would have to be imported. In the mid and long-term environmental benefits are very likely to result, however. It seems that these studies have not gained much attention, though.

<sup>60</sup> More generally, coal mining has lost support among the wider population. For the ruling Social-Democratic Party, which still largely supports coal mining, this creates some difficulties in mobilising voters in NRW.

<sup>61</sup> The new regulation (valid until 2010) that replaces the ECSC treaty aims to contribute to restructuring the coal industry and improve energy security. It allows a certain subsidised minimum quantity of indigenous coal production to be maintained even after 2010. While EU requirements have been further tightened, only after 2010 will coal subsidies be subjected to the normal rules for government aids in the EU (Storchmann, 2004).

more recently by mergers and acquisitions and the creation of highly vertically and horizontally integrated firms in the energy market. Market access for new players is still heavily constrained (Matthes and Cames, 2002).

As to the future of coal and coal support in Germany, recommendations vary, however. This is even the case when looking at the issue from the perspective of ecological sustainability. Broadly speaking, two viewpoints may be distinguished:<sup>62</sup>

The first focuses mainly on the role of German coal technology for the global market and less on the future of coal subsidies (RNE, 2003a, b, c). This perspective is somewhat typical for the German Council of Sustainable Development:<sup>63</sup> “As long as the discussion only revolves around coal subsidies, we do not fulfil our [global] responsibility” (RNE, 2003a). Thus, the Council emphasises the importance of technological innovation and research and development rather than the fiscal implications of coal support. Aiming at an “innovation-oriented energy policy” is supposed to alleviate trade-offs and create synergies. Further research efforts should include renewable energies, efficiency measures on the demand side as well as coal. The Council emphasises in this context that the coal industry may considerably improve its environmental performance in the future and especially reduce its carbon-intensity (“clean coal”) or reduce the damage potential of carbon technologies (e.g. by carbon sequestration). Indirectly, the Council suggests that Germany play a leading role in the promotion and diffusion of efficient carbon technologies and can help improve environmental performance in countries with less stringent environmental standards. While the Council agrees that current coal subsidies should be phased-out until 2010, it recommends using part of the funds saved on energy research for more efficient coal technologies.

Whereas the Council obviously seeks to maintain at least some continuity and similarity between the existing coal support system and future funding arrangements,<sup>64</sup> the German Environmental Protection Agency, the German Advisory Council on the Environment, and the German Advisory Council on Global Change (among others) call for a more clear cut break with coal (WBGU, 2003; Umweltbundesamt, 2003; SRU, 2002). The perspectives for making coal “clean” appear in a more pessimistic light. It is emphasised, for examples, that more efficient technologies are costly and not easily available. They also may create other undesirable environmental side-effects or not meet with approval in the wider population. In the long term, abandoning the use of coal world-wide may therefore be the best option (WBGU, 2003). In the meantime, funds from the removal of coal subsidies in Germany should be used for other purposes, especially to further promote renewable energies and energy efficiency measures. As a consequence, more emphasis is placed on the scarcity of public funds and the welfare losses subsidies have already incurred in the past (e.g. by preventing employment creation in more profitable sectors of the economy).

In theoretical terms the second viewpoint suggests that coal use in Germany has not only led to path dependencies but to multiple lock-ins. In the literature these lock-ins are often associated with carbon technologies (Unruh, 2000; Grabher, 1993). Lock-in implies that there are systematic forces that make it difficult to change the development path of existing techno-institutional systems. These forces and barriers may lead to pervasive market, policy and organisational fail-

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<sup>62</sup> In reality, opinions are more diverse, of course. See the cited publications for details.

<sup>63</sup> The Council has recently organised a hearing on the future of coal for a sustainable energy policy. Based on this hearing the Council has formulated its own position.

<sup>64</sup> The mining companies usually stress that subsidy payments in Germany need to continue to provide a basis for experimenting with more efficient technologies and maintain and “export” high environmental standards. The Council doesn’t draw a clear borderline between subsidies and research funds. Thus, the distinction between promoting R&D in Germany and subsidising production gets somewhat blurred.

ures and create a bias towards mitigating policies and technologies, even in case of growing environmental risk (Unruh, 2000). Escaping carbon lock-in by using “new” carbon technologies is typically not seen as a successful strategy, as this would only send wrong signals on the direction of innovation, reinforce existing development paths and prevent the adoption and diffusion of new technologies (Unruh, 2002, Nill, 2002). Outdated and counterproductive subsidies then often appear as a symptom of carbon lock-in, symbolising especially the close ties and network structures between subsidy recipients, lobby groups, unions, ministerial departments and political parties.<sup>65</sup> Policy should concentrate on the transition to new (carbon-free) technologies or even path-breaking innovations (unlocking). Usually this entails the abolition of “old” subsidies as well as the use of “new” subsidies to overcome critical thresholds (or reach critical mass effects). This transition will typically change actor constellations and institutional structures.

#### 4. Transforming process into mechanisms: some preliminary conclusions

This paper has attempted to identify instances of greening or non-greening of subsidies and subsidy structures in Germany. Based on an analytical framework, we have traced subsidies (or rather subsidy clusters) in regional and energy policy and highlighted historical changes in policy patterns and the role of subsidies therein. Overall, it still seems difficult to identify clear-cut cases of greening, and progress with subsidy reform has been slow. A closer look reveals some progress, however. To conclude we would like to highlight some similarities and differences between the two policy fields considered. While direct comparisons are obviously difficult, referring back to the greening mechanisms identified in Section 2 allows us to make the transformation from historical process to distinct social mechanisms and to draw some conclusions. These conclusions are quite preliminary, as research in the field lacks systematic analysis and offers only little or disparate empirical evidence.

Both subsidy clusters considered – the GRW in regional policy and the system of coal subsidies in energy policy –, were created at a time when environmental aspects played only a minor role in policy-making. In both cases subsidies are part of a narrow concept of sectoral economic policy-making, and subsidies were at times used to promote economic growth and at other times used to alleviate social disparities and maintain regional employment.

Yet, energy policy had, for a long time, a much more narrow focus and was more or less confined to promoting single energy supply technologies. By contrast, it is more difficult to clearly define regional policy. Regional policy is not *a priori* restricted to particular sectors; it employs a broader set of instruments (especially planning instruments apart from financial incentives), and concerns quite different stakeholders. Thus, environmental aspects have been integrated more within a broader concept of regional policy (or more recently, regional governance). In energy policy, changes instead result from external constraints and new framework conditions and challenges. Therefore mechanisms of greening vary in some important aspects.

Not surprisingly, environmental policy filters can be found in both cases (“filtering”). In regional policy, GRW assistance is only granted if the investor complies with all federal, Länder and local environmental regulations as well as the restrictions on land use laid down by town and country planning. Similarly, the mining and steel industry and energy supply companies have to comply with numerous environmental and security regulations to avert immediate danger and restrict emissions from “classical” pollutants (air, water, waste). In both cases, however, the current policy mix is often considered to be inadequate to counteract “persistent environmental problems” or “environmental problems of the 2<sup>nd</sup> generation” (SRU, 2002). Many would

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<sup>65</sup> Subsidies are often associated with rent-seeking activities on behalf of lobby groups. Rent seeking in turn is typically seen as one source of lock-in.

argue that in energy policy in particular more structural and fewer “end-of-pipe” solutions are required (e.g. a change of the fuel mix). In regional policy, indirect planning requirements are often considered to be too noncommittal to counteract “on the ground” environmentally problematic effects of direct financial incentives for economic investments (e.g. with respect to curbing land use).

Energy policy in general and coal policy in particular have for a long time relied on a rather narrow set of instruments. By and large, subsidies in conjunction with regulations have promoted selected energy supply sources and technologies. At the same time, market mechanisms have largely been eliminated. More recently, the scope of action has considerably broadened due to market integration and the process of liberalising the EU electricity and gas markets. Also, the use of subsidies is more strictly supervised by EU state-aid control. In this more competitive environment a great number of alternative options have sprung up and widened the (previously supply-focused) energy market (“optioning”). This “market creation effect” has been flanked to some degree by new environmental policy instruments that operate more on a structural level and try to turn differences in abatement costs into overall efficiency gains. However, efforts to curb the carbon intensity of our economies and the promotion of carbon-intensive technologies still coexist. Also, new privileges for coal have been created as a result of “instrumental innovations” (e.g. the eco-tax reform). Regional policy employs less “global” instruments with structural implications but an array of more specific measures (see also next paragraph). As regional policy is strongly inter-related with policy fields with a more sectoral focus (like housing and construction, transport, agriculture), new market-based instruments in these sectors may restrict negative environmental effects of regional investment subsidies, however. For example, the new toll for lorries (coming into force in January 2005) and further plans to introduce user charges (and the user-pays principle) in the transport sector may help to create regional economies (*regionale Wirtschaftskreisläufe*). This topic seems to be largely unexplored, however.

Regional policy may be considered as a policy field where a great number of “policy experiments” have been made in Germany over the last two decades. These experiments have taken place outside of the institutionalised funding structures of the GRW. Especially in NRW a number of innovative projects (like the IBA Emscher Park) and new institutional arrangements (policy networks, public-private partnerships etc.) have been created. In these schemes, funding decisions often rely on broad-based stakeholder participation or at least consultation (principle of partnership). In this flexible environment, context factors have been realigned at a more decentralised level which provided opportunities for EPI (“loose coupling”). Often these activities were part of a broader regional development concept. Over the years some spill-over effects can be observed: At least officially, the GRW gives priority to initiatives integrated in regional development concepts. Also, the funding repertoire has been altered to some extent (“non-investment purposes”). Overall, there might be too many “weak” linkages, however. Most importantly perhaps, departmental perspectives dominate and restrain (lasting) attempts at “positive co-ordination” and “network management”. To avoid excessive transaction costs, “instrumental innovation” on a more sectoral level (e.g. a reduction in housing and transport subsidies) may be helpful (“optioning”).

The case of German coal policies exemplifies that close ties (or thick institutional tissues) can prevail despite the economic decline of the sector and changing framework conditions. These ties operate on various levels: between and within firms, between industry, government and planning authorities, unions, and associations, and indirectly on a personal, cognitive and cultural level. Often it is suggested that the persistence of coal mining in Germany is a typical example for multiple lock-ins (functional, political, cognitive). These lock-ins have been stabilised by positive feedbacks (like economies of scale, economies of learning or network effects) with subsidies reinforcing these feedbacks. Adopting this view, further support for coal technologies is not an option to really create economic and ecological innovation, since the current inefficient

trajectory wouldn't be left (no "unlocking", "decoupling"). Yet, according to another view there is sufficient room to eventually make coal "clean". Thus, in this perspective coal would co-exist with other energy sources for the foreseeable future ("co-existence", "loose coupling").

In regional policy the idea of Sustainable Development has slowly been taken "on board" and has transformed the policy ("frame adaptation process"). The European Commission may be characterised as one of the major change agents. Those German Länder that benefit from the Structural Funds have started with efforts of mainstreaming the environment into programming and evaluation. External research has particularly highlighted methodological and technical deficits (data, indicators, tools etc.). Some of these deficits have been accounted for (e.g. set-up of environmental monitoring systems). Some capacity-building can also be observed in advisory boards. However, learning processes can be predominantly characterised as instrumental rather than strategic.

Evaluation studies on coal subsidies (and their environmental effects) seem to have only a minor impact on coal policy. Decisions on coal support are still largely a matter of "high politics". While "consensus-conferences" play some role, real consensus cannot be expected (especially on the delicate issue of subsidies). As employment in the mining sector has declined considerably and support for mining in the mining regions has crumbled (also due to lasting ecological "side-effects"), a kind of "reframing from below" can be observed, however.

Some subsidies turn out to be very resistant to change. Exogenous forces from outside the sector (and the sectoral-environmental interface) may then be required to reform and especially reduce or abolish subsidies. When these exogenous forces are powerful or dominate the overall policy discourse (i.e. they are presented as "inherent necessities" [*Sachzwänge*]), they may be used as a leverage for environmental protection ("internalising"). Since there is no guarantee or automatism for environmental improvements, however, and funding for environmental projects may be cut first or more easily, environmental policy is well advised to be prepared for these instances and employ "time strategies" to utilise policy windows (Nill, 2002). An important (and recurring) "exogenous force" are budget constraints. In the case of coal, for example, an intervention from the German Constitutional Court and budget constraints required re-design of the most important coal subsidy ("decoupling"), which led to a further phase-out in subsidy volume. Further opportunities for reform may result from the pending renewal of the German power plant system, as current plants will have to be replaced within the next 20 years (Umweltbundesamt, 2003a). In the case of regional policy it may be more difficult to reduce funding and realise environmental gains at the same time. On the one hand, there may be less need for funding in centralised infrastructure and large industrial parks as the German population will shrink (especially in the East). At the same time, new nature reserves may be created. On the other hand, traffic volume may increase, with adverse effects on the environment (Vorholz, 2004). Again, creating links between regional policy and sectoral policies (like transport, housing) may be helpful here.

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