Background Report

for the Peer Review of German Policies for Sustainable Development

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Preface

The German Chancellery has initiated a Peer Review of Germany's sustainability policies. The peer review process is being organised by the German Council for Sustainable Development. It is based upon evidence drawn from different sources. One of these sources is this background report, which has been prepared by a scientific team in order to provide the peers with background information on the various topics of German sustainable development (SD) policies.

The outline of the background report, the issues and main questions have been discussed and agreed upon among the Peers during a scoping meeting on March 11 and 12.

The information presented in this report has been gathered by analysing literature and policy documents, as well as through more than 30 expert interviews with stakeholders and practitioners from government, business and society about their experiences with Germany's SD policies. The interviews provided rich information and supplemented the background information for the peers. During these interviews, the representatives of the German government, civil society, scientific community and business expressed great interest in the peer review process, as well as in policies for sustainable development in Germany. The research team is most grateful for sharing their experiences and hopes to contribute to a fruitful discussion on the future of German sustainable development policy.

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1. Introduction

1.1. Objective

The Federal Chancellery has commissioned a Peer Review of Germany's sustainable development (SD) policies. To this end, the German government has asked the Council for Sustainable Development to set up a working process and invite distinguished experts to participate as peers. This process is scheduled to deliver its final results in autumn 2009.

The Peers decided to focus their review on Germany's SD policies with reference to the National Strategy for Sustainable Development (NSSD) and Germany's mission towards a low-carbon future. The Peer Review also includes an analysis of the initiatives taken by the private sector, civil society and other actors, since the involvement of a wide range of different players is considered essential.

Germany's NSSD dates back to 2002, when it was prepared and published on the occasion of the World Summit on Sustainable Development in Johannesburg. Since then, several government reports have examined Germany's progress along the road to sustainability and updated the strategy. As well as identifying successes, the reports found many shortcomings, including a failure to meet a number of important targets within the agreed time-frames. To avoid similar future failures, it appears necessary to improve the effectiveness of SD policies and to strengthen the governance mechanisms for SD. To this end, special attention is paid on ways and means in SD governance that will make the NSSD more effective.

1.2. The Peer Review

The Peer Review focuses on future challenges and opportunities of sustainable development—areas of importance in which Germany is either ahead of the field or can learn from other countries' best practices. Changes are required in major areas such as energy supply, consumption, and mobility in order to achieve real progress towards a sustainable future. The Peer Review addresses policy-makers and sustainability leaders in business and civil society in Germany and aims for a significant effect on the related policy areas.

SD is a challenge that requires action from all societal actors. Government and politicians alone cannot bring about a sustainable future: Contributions by civil society and business are needed. Involving these groups is the key not only to a better understanding of SD, but also to achieving the diversity of approaches needed to tackle the complex process of change.

Germany's National Strategy for Sustainable Development (NSSD) and SD policies cover a wide range of environmental, social and economic issues. It is not possible to analyse in sufficient detail and depth all relevant aspects. In this report the exemplary issue areas, which have been recognized as priorities by the peers, are analysed in respect of current strengths, weaknesses and the future potentials of gearing business, society and governments towards sustainability. The focus should not imply that issues not addressed in this report are of minor importance. Moreover, our exemplary analysis of selected fields cannot fully examine all aspects of interconnectivity among the various issues and societal systems. The selection of issues is to a large degree related to the urgently pressing issues of climate change and the need to transform to a low-carbon society. By using the term "low carbon society" rather than "low carbon *economy*", we emphasise the needs for fundamental changes beyond the introduction of new and efficient technologies only. The transformation to a low-carbon society is not only an economic or technological challenge, it requires a change in life styles, as well as far-reaching changes in the framework conditions on national European and international levels. A low-carbon society is achievable only if society, economy and political institutions integrate SD into the core of decision-making. This is likely to have spill-overs to other societal challenges as well: A society that is prepared to cope with climate change is likely to manage other sustainability challenges as well.

The Group of Peers

The group of peers is fully independent. It comprises eight distinguished practitioners from business, civil society, politics and administration. They provide essential and complementary experience in the different areas, including implementation, corporate sustainability, SD in civil society, evidence-based decisions, grass-root action, participation and communication, global governance and technology.

The group is chaired by Björn Stigson, President of the World Business Council for Sustainable Development (WBCSD). He is joined by Dr Jeroen Bordewijk and Dr Suresh P Babu: The former is a member of the Dutch Advisory Council for Research on Spatial Planning, Nature and the Environment (RMNO), who has 31 years' experience working with Unilever; the latter has over 30 years' professional experience in North-South technology transfer and the perspective of developing countries in technology research. Together they provide a business perspective on SD and experience with regard to the role of research and technology in major transition processes. A political and administrative perspective is provided by: Pekka Haavisto, Member of the Finnish Parliament and former Finnish Minister for the Environment and Development, who has wide experience in post-conflict assessment and peace-building; Derek Osborn, Member of the European

Economic and Social Committee and Vice-Chair of its Sustainable Development Observatory; and Pamela O'Donnell, Director of the Sustainable Development Division of the Canadian Ministry of Foreign Affairs and International Trade. Finally, Jennifer Morgan forms part of the peer team as well. She directed the climate change program of the EG3 at the time of her appointment and is now the director of the climate change and energy program at the World Resources Institute. The invited member of the group, Andry Ralijaona, General Secretary of the Madagascar Action Plan, was not able to participate due to the current political situation in his home country.

1.3. The Background Report

The Peers met in March 2009 for a scoping meeting. During this meeting, the outline of this report, the priority issues and questions were discussed and agreed upon. This background report aims to inform the Peers about the selected issue areas, which have been recognized as priorities. Based on a review of literature, policy documents and interviews with experts, this report describes selected German SD policies, introduces key acting institutions and gives an overview of the German SD debate for the issues at stake.

In total, 31 interviews were conducted to gather information on government policies and societal and business activities geared toward achieving sustainable development in Germany. The interviewees are from the German Bundestag, various Federal ministries, state governments (Länder), the associations of local municipalities, organisations of civil society, current and former members of the Council for Sustainable Development, associations of enterprises and the scientific community. The aim of the interviews was to evaluate the effectiveness of the Sustainable Development (SD) Strategy, to analyse SD governance mechanisms, and to identify political, societal and entrepreneurial initiatives for SD.

The experts are involved in the initiation, planning and execution of sustainability policies. They hold senior positions within their organisations, while at the same time overseeing the practical implementation of these policies on the administrative level. Most often the interview partners represent the administrative level, but some are elected politicians or in top-level management.

The interviews were based on a semi-structured questionnaire. The topics were discussed in detail on the basis of non-standardised questions focusing on the respective organisations, activities and experiences. The questions focused on three central issues:

1) SD initiatives within the interviewees own domain, department or respective institution; current plans, limitations and problems with implementation;

2) Their perceptions of the institutions of the SD strategy with regard to their effectiveness; and

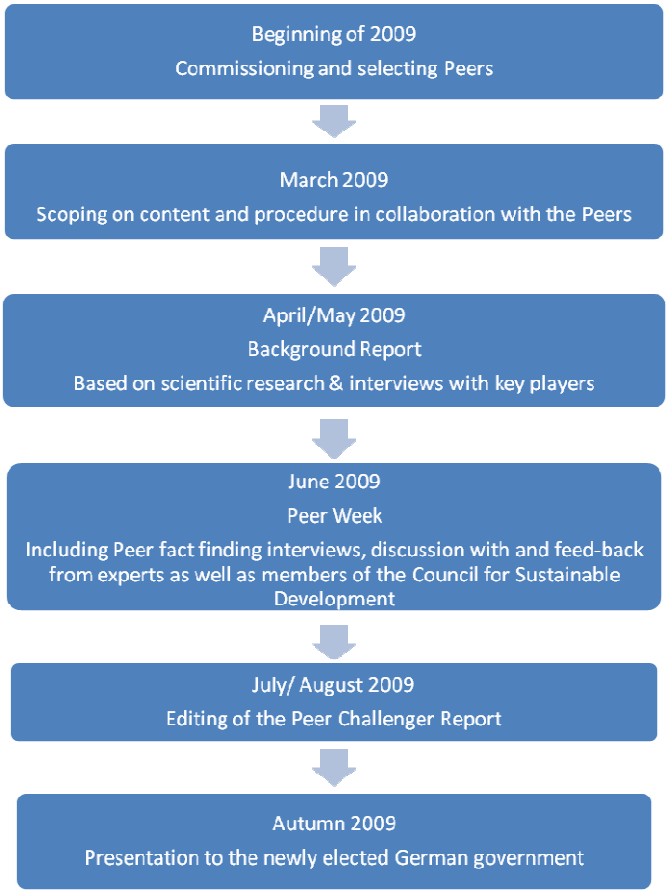
3) Their perceptions of other actors' orientations towards achieving SD.

In addition, we asked for ideas for improvements regarding institutions and possible innovative topics in SD. The interviews were conducted from April 22, 2009 to June 2, 2009 in Berlin, Bonn, Stuttgart, Hamburg, and other cities. They typically lasted one to one and a half hours.

The German Council for SD commissioned this background report. It is one of several sources to inform the Peers on the state of affairs in Germany.. The following graphic (figure 1) illustrates the procedure of the German Peer Review.

The remainder of the report is as follows: In the following chapter (2), we summarize the main challenges of a sustainable development for Germany and we highlight some of the global trends and initiatives to respond to these challenges. In the following section (3), we analyse the German Strategy for Sustainable Development in greater detail. We present our findings on the working procedures and impacts of the institutions and processes for the implementation of the strategy. In the following chapter (4) we analyse selected and exemplary issue areas, policies and trends also beyond the scope of the SD Strategy. Based on these analyses, we outline key areas for action in the final section (5), to better explore the opportunities and to gear Germany's societal development better into the direction of SD.

Figure 1: Procedure of the German Peer Review



2. The International Perspective: Germany's Role in Sustainable Development

2.1. Sustainable Development – A Worldwide View

Serious environmental pressures like land-use change, loss of biodiversity and climate change (to name just a few) call for drastic action. The impacts of these challenges will not be exclusively environmental. They will have great impacts on the global economy and on human well-being. Responses to such large challenges need to be developed on all levels of governance—international, national, regional and local. While acknowledging the manifold dimensions and issue areas of SD[1], this report concentrates largely on the issue of climate change.

The impacts of economic growth and increases in population, the finite reproduction and absorption capacity of the natural environment, as well as increasing competition over resources and distribution pose a massive threat to the stability of our interdependent, globalised world. We face myriad interconnected challenges, including the financial crisis, climate change, rising energy and resource prices, biodiversity loss, various forms of poverty and the lack of equal opportunities between societal groups and among societies. Climate change has the potential to exacerbate all of these challenges.

The evidence of climate change calls for drastic action. Reducing man-made greenhouse gases (GHG) emissions will require greater and more concerted action than has been undertaken so far. Recent figures from the Intergovernmental Panel on Climate Change (IPCC) indicate that global GHG emissions must be reduced by at least 50 percent by 2050 (compared to 1990) to maintain a 50-50 chance of limiting global temperature increase to 2 degrees C. This implies 80 percent emission reductions for industrialised countries (Hare 2008: 16). Without such action, damage to the world's environment will be catastrophic and, at least in part, irreversible, causing immense economic costs and risks to security. Living conditions for many will deteriorate. There are many indications that there are not only tipping points for the climate, but also breaking points for global social order. Such breaking points could result in dynamic and far-reaching changes in economic, political and social relations leading to the breakdown of economies, increased

[1] Following the so called Brundtland definition, sustainable development „is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987: 43).

migration and possibly even to military conflict over resources (e.g. Carius and Lietzmann 1998, Welzer 2008, Stark et al. 2009).

Despite the potentially dramatic impacts of climate change and the need for action to mitigate and adapt, a double-edged sword of action can be observed in the both government and business. The risks of moving first are often perceived as too high by actors from government, business and society. First movers are potentially rewarded with great economic opportunities for cornering the market on climate friendly technologies. Yet, first movers also run the risk of betting on the wrong technologies, or paying too high prices. This leads to a stalemate both on the national level as well as in international negotiations because of disputes over the distribution of the costs of action.

Despite these challenges, climate change mitigation has recently gained momentum both in Germany and worldwide, as more and more actors realise the economic benefits of early action—as well as the likely tremendous costs of inaction. Governments are increasingly adopting regulations and supporting technological innovations for a low-carbon future. Yet, governments still seem unable to develop adequate strategies to achieve the fundamental transformation that is needed. The *indirect* and often intertwined costs of inaction on climate change are rarely addressed. Climate change debates usually focus on environmental impacts, rather than address the broader impacts on society. Rising temperatures will have negative impacts across many parts of the economy: health care costs will likely rise, as diseases are more easily spread in warmer climates.

While no country is performing well overall in sustainable development policies, several countries have successful programmes that could serve as models for Germany as it moves towards a low-carbon, eco-efficient and sustainable society. The current situation in Germany suggests that, while compared to other countries, it is in a favourable position, major efforts will be necessary to reach this goal (see also chapter 3).

Climate change holds a special position in the debate about sustainability. In Germany, it has received more attention and has been analysed in greater depth than any other global environmental problem to date. Awareness of climate problems has found its way into politics, business and society. Climate change is a top priority in the German SDS (Bundesregierung 2002: 132ff), reflecting national and global risks and opportunities. While there is a broad consensus on the need to reduce emissions, there is considerable dispute over the methods and the time-horizon for action. Climate policies potentially have considerable distributional impacts; ambitious policies produce winners and losers.

Germany's current energy consumption is marked by a large-scale use of CO_2 intensive technologies in electricity production, transportation and housing. Furthermore there is large potential to increase energy efficiency (see chapter 4.4). However, any significant

shift away from the current patterns of energy use requires innovation and large-scale investment. The challenge is to mobilise the required resources quickly and to avoid unfairly burdening certain sectors, societal groups or regions. In addition, any change will have to deal with the vested interests of large industrial sectors. Current incentives for industry and consumers to mitigate the effects of climate change are not sufficiently addressing the extent of these requirements. Climate change also creates enormous opportunities—for example, energy efficiency can lead to immense cost savings (McKinsey 2008). The number of "climate pioneers" benefiting from ambitious climate policies in the technology and service sectors is growing. Climate pioneers form the basis for the structural change needed to achieve a low-carbon society (LCS). Germany's boom in green markets is impressive and it shows that ambitious responses to climate change are also boosting the overall competitiveness of the economy (see chapter 4.1).

In a recent study on the low-carbon economy, McKinsey analysed the potential for reducing greenhouse gas emissions. The study finds that a 35 percent worldwide reduction of GHG emissions by 2030 is economically feasible. The technical, economic and financial potential exists, but it needs to be exploited with great determination and efficiency. If action is taken without delay, the 2°C target could still be met. Despite the safe returns and existing support schemes, a number of hurdles still need to be overcome on the road to a low-carbon society:

- The distribution of costs and benefits of energy efficiency measures (e.g. energy retrofitting of buildings) between users and investors fail to provide sufficient incentives for investment (see chapter 4.4).

- Long-term planning for investors and major energy consumers is unreliable if not impossible. The current energy systems are based on capital-intensive large-scale power stations and a capital-intensive infrastructure. Hence, a reconstruction of energy systems requires long-term planning. However, consistent market based instruments are missing (e.g. an OECD or worldwide carbon market with auctioning rather than grandfathering, CO_2 taxes, etc.). Legislation does not provide sufficient transparent and long-term framework conditions for investments.

- Innovations lack market access and diffusion because of insufficient capital, skilled workers, infrastructure, intellectual property rights and missing standardisations. Despite national and international opportunities for new technologies, coherent global mechanisms to coordinate the development and diffusion of climate friendly technologies do not exist.

Many European businesses still lack sufficient incentives to reorient their business models to clean or cleaner production and services. For example, carbon pricing within the context of the European Trading Scheme (ETS) is not yet sending significant price signals. If businesses were dealing with a more accurate—that is, higher—price of carbon, they would be more likely to adjust their business practices away from carbon-intensive activities.

But even in the absence of incentives, there are many reasons to re-orient markets, including:

- Increasing energy efficiency cuts emissions and reduces the costs of production and usage. This generates competitive advantages. The more energy prices grow, the bigger the savings. Long-term growth of energy prices appears highly likely on the global scale.
- A green and innovative economy is providing new opportunities for employment and thereby increases social welfare.
- Switching to renewable energy and efficient energy concepts reduces the dependency on fossil fuels. It also creates jobs, growth, and investments in green tech.
- Governments and consumers increasingly reward pro-environment, climate-friendly behaviour. Given sufficient price transparency, price differentiation for premium environmental products and brands is accepted by the market. But there is still potential for economies of scale and technological learning to reduce costs and allow even wider groups of consumers and areas of the world to purchase sustainable goods.

Modernising the economy and harvesting low-hanging policy fruit, however, is not enough to bring about a sustainable transformation towards a low-carbon society. One key missing element is engagement with society: Societal values and norms toward more sustainable outcomes must be strengthened, and opportunities must be created for citizens to meaningfully participate in society. This could lead to a culture of sustainability and new lifestyles beyond consumerism. The advantages from having sustainability as a guiding cultural norm will not be limited to climate and environmental protection.

2.2. Germany's Efforts to Achieve Climate Objectives

The potential consequences of climate change are nothing short of dramatic. In the political discourse, the costs for ambitious environmental and climate protection are often overestimated. However, many studies such the Stern Report (2007) or McKinsey's 2008

assessment of the "*Costs and Potentials of Greenhouse Gas Abatement in Germany*" have shown that the benefits significantly outweigh the costs for climate protection, at least on a societal level, if not for each single enterprise (McKinsey 2008). In Germany, the Stern Report was well received and is still much quoted. It translates the costs and benefits of climate change into concrete monetary terms. Stern's conclusion is that neglecting climate protection could damage global GDP by up to 20 percent per year, while effective climate protection would only cost around 1 percent of annual global GDP (Stern 2007). Although the methods of calculation used by Stern and others have been criticized, there is no dispute that the sooner decisive measures are taken, the smaller the ecological, economic and humanitarian damage will be. The Federal Environmental Agency and the German Institute for Economic Research have undertaken similar studies with comparable results for Germany (UBA 2007; Kemfert 2007).

However, the costs and benefits of climate policies are unequally distributed among societal groups and sectors, among the regions of the world and over time. This unequal distribution leads to conflicts, which holds true for Germany as well. In addition, power is likely to be unequally distributed as well: Traditional CO_2-intensive industries often have better access to political institutions and stronger lobbying power compared to new, innovative industries. This kind of lopsided power structure is a barrier to achieving more sustainable, successful climate policies, while it helps to understand why unsustainable industries continue to be highly subsidised. Such subsidies include 2 billion EUR annually for the German hard coal sector alone, which makes it the sector receiving the largest share of subsidies in Germany (BMF 2008: 5). Overall, the sum of environment-harming subsidies is estimated by the Federal Environmental Protection Agency to be as big as 42 billion EUR per year (UBA 2008).

Germany, within the European Union, is promoting the UN Framework Convention on Climate Change's goal to stabilize GHG emissions in order to assure that global temperatures do not exceed 2°C compared to pre-industrial levels. Germany's government acknowledges the need to cut emissions by at least 50 percent compared to 1990 levels by the year 2050 to achieve this goal. Recent calculations of the German Advisory Council on Global Change call for an even quicker and more radical cut in emissions (WBGU 2009). Considerable efforts are needed during the coming years to meet the challenge of emissions reduction. The need for a long-term reduction has to translate into ambitious mid-term goals and measures. Europe has announced emission cuts by 20 percent by 2020. The EU further committed itself to a reduction of 30 percent, on the condition that other developed countries agree to comparable reduction goals in a post-2012 interna-

tional framework (COM 2009). In addition, German climate policy proposes a 40 percent reduction, if the EU adopts the 30 percent goal.

Taking into account Germany's energy mix, these goals are ambitious. Although Germany has significantly diversified its energy structure (see the 2008 Progress Report) and increased its renewable energy capacity over the last two decades, fossil energy still dominates the energy mix: mineral oil with 34.6 percent of consumption is followed by coal (24.3 percent) and natural gas (22.8 percent). The share of nuclear energy in primary energy supply has been increasing slightly in recent years, and amounts now to 11.5 percent. Due to its high share of fossil fuel consumption and comparatively low share of nuclear and renewable energies, Germany's CO_2 intensity and per capita emissions are above the EU-27 average (COM 2007a: 45, 55).

Germany is highly dependent on energy imports. Since 1990, imported energy has increased by about 30 percent. Almost three quarters of Germany's domestic energy supply originates from imports. Crude oil accounts for more than half of imported energy (56 percent) and is mainly imported from Russia and Norway. Natural gas, also imported from these two countries and the Netherlands, accounts for almost a third of Germany's imports. The suppliers for hard coal include Poland, South Africa, Russia, among several other smaller providers (COM 2007a: 55). Renewable sources show an impressive increase since 1990 and amount to 7.3 percent of primary energy supply and 14.2 percent of electricity generation in 2007. Thus, Germany surpassed its own goal for renewable electricity development of 12.5 percent by 2010 ahead of time. Furthermore, renewable energy deployment holds a significant share in Germany's GHG emission reductions. In 2007 renewable energy accounted for 115 million tonnes (Mt) of avoided CO_2 emissions (BMU 2008a: 8).

Germany's emission reduction goal, based on the Kyoto Protocol, is to reduce GHG emissions by 21 percent on average between 2008 and 2012 based on its 1990 GHG emissions of 1,232 Mt of CO_2. According to recent calculations, Germany reached this goal already in 2008 with a reduction of 287 Mt of GHG emissions to a level of 945 Mt CO_2. (UBA 2009). This is equivalent to a 23.3 percent reduction. In addition to greater use of renewable energy, overall reduction of CO_2 emissions in Germany can be explained by two factors: an ongoing fuel switch from CO_2-intensive coal and lignite to natural gas and the decline of polluting industries in the new "Länder" after reunification. All other amounts of GHGs emissions have hardly changed (UBA 2009).

As a result of its success in CO_2 emissions reduction, Germany is perceived as a role model by many countries. But additional efforts are needed to achieve future goals. There is little to no policy framework for the time period after 2020. The lack of a decarbonisa-

tion plan—both for the country as a whole, and for single sectors—up to 2050 allows a focus on short-termism.

International Benchmarks

Every G20 country includes green elements in its economic stimulus package. Although it is difficult to assess the substance of the different packages, there are considerable differences. Leading the way is South Korea, where 80.5 percent of all stimulus measures have to be implemented in the area of environmental and climate protection; this is equivalent to 3.2 percent of GDP. China also plans to direct over a third of its massive economic stimulus package towards green investments (BMU 2009b). The study "Green New Deal" by the Worldwatch Institute (French et al. 2009) reveals that the share of green investments in the German economic stimulus package is below average compared to other countries.

Overall, efforts to achieve a low-carbon economy have gained momentum internationally in recent years. Especially the involvement of developing countries and emerging economies is moving up the political agenda. The United States, the UK and Japan have set up the Climate Investment Fund, managed by the World Bank. The Clean Development Mechanism (CDM), the Global Environment Facility (GEF) and climate-related development cooperation represent additional options for state-run and private climate protection projects that are carried out in conjunction with developing countries and emerging economies.

Several countries such as Great Britain, Japan and recently the United States have put ambitious Low-Carbon Emission programmes in place, which can serve as examples for other countries where efforts are underway:

- In November 2008 the British government adopted the so-called Climate Change Act. The act requires that "the net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline" (Controller of Her Majesty's Stationery Office and Queen's Printer of Acts of Parliament 2008: 1). By legally implementing the IPCC's recommendations and supplementing them with binding carbon budgets out to 2050, the British government highlighted its commitment to drastic action on climate change.
- Having already shown the way with its Top Runner programme, Japan sees considerable potential in civil society, alongside its numerous economic and technical support programmes. Its goal is to achieve not a low-carbon economy, but a low-carbon society. Japanese citizens are to be systematically involved in building such a society through new transport and traffic concepts, low-carbon city projects, and participative education, training and marketing campaigns, such as

Cool Earth Day (GERF 2008). The aim in Japan is to establish environmental and climate protection as a sophisticated lifestyle. This will be helped by changes in consumer behaviour, achieved via increased transparency in product and financial markets.

- The "New Energy for America" plan announced by Obama and Biden in 2009 places emphasis clearly on energy independence and energy efficiency. For example, with the help of government subsidies, at least one million US-built plug-in hybrid cars are to be put on the road by 2015. A total of US$150 billion will be invested in clean energy technology over the next 10 years, with the goal of creating 5 million green jobs and attracting private investment (Salazar 2009). Even before the climate turnaround introduced by the new administration, the green community had many adherents in US civil society and the private sector. As far back as 2007, private investments exceeded US$50 billion in the area of alternative energy alone (Fücks 2008). Individual states, such as California, have long shown a strong commitment to climate protection. In addition to the comprehensive climate policy development in several states, US cities have stepped up and are undertaking various policy initiatives to reduce GHG emissions. Cities and local municipalities are in a good position to shape various energy, and thus GHG-related, policy areas—examples include land use, land-use change, resource efficiency in building codes, public transportation, and local renewable energy deployment. The U.S. Conference of Mayors' Climate Protection Agreement has been signed by 944 mayors representing 84 million US citizens (more than one fourth of the US population). Under the agreement, cities decided to meet or even exceed the US Kyoto target of a 7 percent reduction through a wide range of policy measures. The effort also urges state and federal governments to implement similar reduction goals, and urges Congress to adopt a national emissions trading scheme for GHGs (Mayors Climate Protection Centre 2008). In order to strengthen the cooperation between the US and Germany on energy and climate issues, Minister for Foreign Affairs Steinmeier and the Minister for the Environment Gabriel initiated a "Transatlantic Climate Coordination" (Auswärtiges Amt 2008). Numerous organizations from the realms of politics, economics, science and civil society on both sides of the Atlantic have taken part in this initiative. The goal of this program is to influence the political agenda, strengthen political actors and assist in mediating transatlantic cooperation for worldwide climate change policy.

Yet, though Great Britain, Japan and the United States have set the various climate-related goals and targets, their overall performance in mitigating climate change is mixed. On the whole, they are still high-carbon societies maintaining various unsustainable trends.

Germany's Role in a Low-Carbon World

Germany has ambitiously taken a leading role in combating climate change and its impact on the national, European and international levels. This ambition is enforced by implicit expectations of other nation states (especially within the EU) that Germany will act as a forerunner in climate policy. Thereby, in principle, Germany has a good starting point for taking the lead in climate policy and achieving a low-carbon society:

- Germany traditionally has a high level of environmental awareness. There is stronger support here from society, politics and academia for ambitious climate protection than in many other countries. The cultural and intellectual groundwork for achieving a low-carbon society is therefore already in place.

- German environmental technology is highly successful in several green tech markets, thanks to Germany's comparatively strict environmental regulations and generous incentive schemes (see section 4.1.1). The German green tech industry has a large interest in extensive climate protection. At the same time, many traditional German companies (e.g. in the automotive sector) fear to lose out due to an overly committed climate policy, but have to cope with changing markets (see chapter 4.5).

- Fighting climate change seems to rank high on the German political agenda and also have strong backing by Chancellor Angela Merkel. This became especially apparent during the German EU Presidency and the G8 summit in Heiligendamm in 2007, where Merkel managed to commit the other political leaders to shared climate goals. Her actions, however, have been criticized as insufficient by environmental groups. Expert interviews indicated that various German ministries, including the Federal Foreign Office, the Federal Ministry for the Environment, and the Federal Ministry of Labour and Social Affairs, have an increasing role in shaping economic policy in favour of a LCE restructuring (expert interviews). This concerted action can create momentum for structural change in the area of the environment. Yet, these interventions have been met with criticism from business circles as well as the Federal Ministry of Economics and Technology. (e.g. Bardt 2008)

As a result of the favourable conditions, in Germany, environmental and climate protection has become a major economic factor. The number of people in Germany working in the environmental sector is estimated at 1.8 million and the environmental industry has grown by an average of 10 percent each year since 2002 (see chapter 4.1).

An analysis of the German environmental technology market by Roland Berger Strategy Consultants (BMU 2009d) identifies the following lead markets for environmental technologies (s.a. Jacob et al. 2005): Energy efficiency, material efficiency, waste management, sustainable water management, and sustainable mobility. German companies operating in these markets have seen particularly high growth in their revenues and size of payroll in the past years. Particularly in the area of energy efficiency and sustainable mobility, many companies have had profit margins over 10 percent in recent years. German environmental expertise is in demand both in the highly developed US, Japanese and EU markets and in emerging economies. Germany exported environmental friendly goods worth EUR 59.5 billion in 2007, giving it a global market share of 16.1 percent. This makes Germany the number one exporter of environmental technology, ahead of both the US and Japan.

In addition, German companies are particularly successful in the area of sustainable energy. For many technologies the performance (in terms of revenue, market share and job creation) of German companies is outstanding (see chapter 4.3). Germany holds a strong position in various areas of climate protection. “Green tech made in Germany” is highly regarded and sells well internationally (BMU 2009c). However, the markets for green technologies in Germany can be expected to receive more competition from abroad. Innovative technologies (fuel cells, solar thermal applications, Carbon Capture and Sequestration, etc.) and flexible-but-strict regulatory mechanisms must be developed further, funded, and widely implemented to maintain the strong international demand for high-quality German technology. This requires fruitful cooperation between the business world, politicians, academics and civil society. It involves spreading norms, standards and effective policy models.

Despite its positive performance in some areas, Germany faces a number of challenges on the road to achieving a low-carbon society. Germany is still a high-carbon society. Under the European Commission’s proposed target, based on the IPCC’s Fourth Assessment Report, industrialised countries will have to operate within 40 years with 60-80 percent less carbon emissions (COM 2007b: 5). Doing “business-as-usual” will not suffice to meet the necessary carbon reduction goals and ensure long-term sustainability. This is particularly clear in Germany, where roughly half of the carbon reduction achieved to date is due to

the economic collapse of the former German Democratic Republic following reunification in 1990 (Statistisches Bundesamt 2008: 9).

Germany still has not managed to decouple economic growth from energy and resource consumption. Efforts need to be stepped up considerably in order to meet the targets set out in the German government's Integrated Energy and Climate Programme (IEKP). Germany's energy productivity grew by just under 40 percent from 1990 to 2007 (Statistisches Bundesamt 2008: 5), but this is still a long way off the goal of doubling productivity by 2020.

The 2008 Progress Report by the Federal Government, the Indicator Report by the German Federal Statistical Office and the Traffic Light Report, published by the German Council for Sustainable Development, highlight a number of trends, which counteract the sustainability goals.

The following four issues are closely related to the goal of a LCS but at the same time they show unsustainable trends:

- Energy intensity: The goal set out in the national strategy is to double energy productivity by 2020 compared to productivity in 1990 (Bundesregierung 2002: 147). This target will not be met at the current rate. An increase in energy productivity by 2.8 percent per year would be necessary to meet the target. The actual average level from 2000 to 2007 was 1.7 percent per year (Statistisches Bundesamt 2008: 5). Energy intensity has a strong impact on both carbon emissions and natural resource dependency and is thus of major importance for low carbon (LC) development.
- Land use: The goal is to reduce the increase in land use to 30 hectares a day by 2020 (Bundesregierung 2002: 189). However, between 1992 and 2005 land use decreased only marginally from 120 to 118 hectares per day. The current use is 113 hectares per day (Statistisches Bundesamt 2008: 12f). Additional land use for settlement and transport increase the long-term costs of infrastructure in a society with drastically changing demographics; such land use also has damaging effects on nature protection, organic farming and the use of land as a carbon sink.
- Transport: The indicators show that the goals for both goods and passenger traffic will not be met. The intensity of goods traffic was supposed to decrease to 98 percent in 2010 and 95 percent in 2020 (compared to 1999 levels) (Bundesregierung 2002: 111). In reality, it grew to 109.9 percent from 1999 to 2005 (Statistisches Bundesamt 2008: 30f). Passenger transport intensity fell to 95.9 percent between 1999 and 2005, but will still not meet the national goals of 90 percent in

2010 and 80 percent in 2020 (Statistisches Bundesamt 2008: 32f). The targets for goods traffic intensity by ship and by train will also not be met

- Research and development: According to the target, combined private and public investment in R&D should reach 3 percent of GDP in 2010 (Bundesregierung 2002: 106). The actual level remained at around 2.5 percent between 1991 and 2005 (Statistisches Bundesamt 2008: 21). Without increased effort, this target is unlikely to be met.

Another key issue for SD is education. The impact of education ranges from preparing people for careers in low-carbon sectors to raising public awareness about the importance of a low-carbon society. Neither aim is currently being met. A study on behalf of the German Federal Ministry of Economics and Technology found a large— and widening— gap between supply and demand for technology-orientated qualifications, especially in the area of green tech (Koppel 2007). Such qualifications are necessary if Germany is to maintain or expand its expertise in low-carbon technology.

Germany plays an active role in the UN Decade of Education for Sustainable Development, but as the expert interviews have revealed, it has failed to sufficiently implement the concept of life-long learning and partly lacks a focus on SD.

The UN Commission on Sustainable Development has called for education systems to focus on changing unsustainable behavioural patterns. In particular, it states that academia must fulfil its role as a multiplier of SD concerns and that learning ought to be more participatory to strengthen knowledge assimilation and induce the necessary changes in behavioural patterns. Another problem is that teaching materials on SD for various professions is often not available (BMBF 2002: 5f). The potential of education to raise public awareness has not been sufficiently exploited.

Europe, including Germany, must remain credible through the development of effective institutional arrangements, policy measures and instruments to foster a transformation process, which is oriented on sustainable development goals. Otherwise we run the risk that the vision of sustainable development will lose its power. Experts have stated in interviews (executed for this background report) that Germany has to translate its ambition to be a leader in climate policy into concrete action. Business, politics and civil society must espouse this goal publicly and work together to achieve it. Some of the experts indicated that ambition and reality of German sustainable development policy still diverge considerably.

3. Germany's SD Policy and Implementation

How does Germany respond to the challenges outlined above? In the following, we analyse German governance mechanisms, which were set up to respond to these trends and challenges. In our descriptions and analysis we not only focus on the national governmental level, but include trends and innovations on the sub-national level as well as among non-state actors. We are particularly concerned with the inter-linkages and interplay between the different domains of decision making.

3.1. Origin and Political Context of the National Strategy for Sustainable Development

Germany's governmental policies for Sustainable Development are anchored in the National Strategy for Sustainable Development (NSSD) that was published in 2002 shortly before the World Summit in Johannesburg (Bundesregierung 2002). The first preparatory steps were already undertaken in the 1990s by the conservative-liberal governmental coalition led by Chancellor Kohl. The strategy was the responsibility of the environmental ministry and initially the process focused exclusively on environmental issues. Those efforts failed and the draft strategy documents never passed cabinet level. Both the focus and the priority changed with the turnover in government in late 1998 to a coalition of Social Democrats and the Green Party led by Chancellor Schroeder. At that time, Parliament voted unanimously in favour of restructuring and restarting SD policies on the federal level. Parliament asked for a strategic process with concrete responsibility attached to a purposefully designed State Secretary Committee to be introduced. In order to ensure further progress, Parliament also asked to establish a Council for Sustainable Development as an independent and high profile societal body to advise the Chancellery on the basics of sustainability policies and to develop public support.

The responsibility for the preparation and oversight of the strategy's implementation was assigned to the Federal Chancellery. The development and adoption of cross-sectoral strategies is rare in the German political system and culture, with the exception of the High-tech-Strategy and the Federal Climate and Energy Programme. Otherwise, policy-making in Germany is highly specialised and sectionalised with a high degree of departmental independence. Therefore, the initial steps required learning and adaptation of new styles of policy-making, as well as an institutional set-up requiring innovative thinking. The management approach is arguably the most important innovation: The strategy entails a number of clearly defined objectives and a set of institutions for implementation, including the coordination of the chancellery, a standing committee on the level of deputy

ministers, a standing working group of senior officers, the Council for Sustainable Development and the parliamentary advisory council. Furthermore, there is regular reporting on the progress of the SD indicators.

The institutional setup and the management approach were not altered even after the government shift in 2005 to the coalition of Christian Democrats and Social Democrats led by Chancellor Merkel. The new government made efforts to improve institutionalisation: as a result of the preparation of the 2008 progress report, the more frequent meetings of the Committee of Secretaries of States, the reporting obligations for the departments, the new high level Federal-Länder working group and the sustainability impact assessment for legislation are important innovations. However, despite the consensus on the need to develop a SD policy and its basic goals, the priorities and instruments to achieve these goals are considerably disputed on all levels of governance and within German society.

Table 1: Timeline of Germany's SD policies

Since 1971	Comprehensive federal environmental laws and policy programmes in the responsibility of the Ministry of Interior
1987	Publication of the Brundtland Report "Our Common Future", German member: Volker Hauff
1987	Bundestag appoints an Enquete Commission "Precaution for the Protection of the Earth's Atmosphere"
1992	Germany signs the Rio Declaration (Agenda 21), Declaration on the national transposition of the sustainable development concept
1990s	Peak in activity by civil society on the local level: Local Agenda 21
1994	Bundestag appoints the Enquete Commission "Protection of Humans and Environment"
	On the basis of the final report Parliament (unanimously) recommends the institutional scheme designed to deliver a National SDS (Council for Sustainable Development as stakeholder body; State Secretary Committee; targets and timetables as core elements of a strategy)
1996	Environmental NGOs and churches campaigning with a report "Zukunftsfähiges Deutschland" (Sustainable Germany); big influence on public debate
2000	Governmental decision to set up the Council for Sustainable Development

	(RNE) and a Secretaries of State Committee for Sustainable Development
2001	Appointment of the Council for Sustainable Development
2001	Private sector establishes “econsense”, SD-Forum of German Industry
2002	Adoption of the governmental strategy “Perspectives for Germany – Our Strategy for a Sustainable Development”
2004	Founding of the Parliamentary Advisory Council on Sustainable Development
2004	First progress report on the Sustainability Strategy
2006	Indicator Report 2006 (21 Indicators of NSDS)
2008	Council on Sustainable Development publishes “traffic light report” on the progress in sustainability indicators
2008	Second Progress Report on the Sustainability Strategy and Indicator Report 2008
2008	Creation of a Federal-Länder working group
2008	Decision for the implementation of a sustainability impact assessment in legislation procedure

3.2. The Management Concept of the Strategy

The German NSSD is based on a management concept that comprises an institutional setting within the federal government and Parliament as well as a monitoring process and societal and political participation. There are 10 general management rules that aim to provide general direction for decision-making (Bundesregierung 2002: 50ff., 323ff). The strategy details specific objectives for 21 priority areas with indicators and a realistic timeframe to achieve the goals. In international comparison, the high level of specificity of the objectives and indicators and the concrete targets are perceived as an asset of the German strategy.

The goals and the (rather analytical and not operational) management rules are defined within the issue areas of generation equality, quality of living, social cohesion and international responsibility (Bundesregierung 2002: Chapter B). The issues of the strategy are not aligned with the institutional responsibilities of specific departments, even though there is a coordinating role of one or several ministries for each of the goals. They share

the responsibility to take measures to achieve the SD goals. The State Secretary Committee steers this process, takes political decisions and represents this joint ownership.

Several goals and indicators do not fall under the sole responsibility of the federal government. Vertical integration, at least coordination, of the federal, Länder and local level is needed. For example, land use and education is a subject matter for *Länder* and their respective municipalities. Goals regarding the employment of women are perceived to be largely the domain of economic actors with few options for governmental policies. The goals vary with regard to the level of ambition and difficulty necessary to achieve them. Some of the goals, however—efficiency in transport, for example—are beyond what one could expect to achieve. These reflect the fact that the goals are chosen in a political process and thereby represent the legitimisation of politics on the one hand, but on the other are meant as an additional push. A public commitment to the objectives and trends, beyond the immediate control of policy makers, is perceived as an asset to the strategy: At first glance, the commitment to goals and the publication of unsustainable trends in their domains can be seen as unattractive for the heads of ministries (Statz 2009: 85). However, the expert interviews reveal that the level of ambition is a (potential) driver of policy. Furthermore, it has been mentioned by some experts that there is a need to balance problematic trends and the communication of achievements to keep the support of politicians.

The management concept entails regular reporting to provide feedback on achievements. The headline indicators can only partially fulfil this task. Primarily, they give political signals on a general level to communicate the state of SD policies. In order to assess the results of specific political measures, a more detailed analysis of underlying driving forces and the effects of political instruments is necessary. The Federal Statistical Office has delivered the biannual Indicator Report since 2006 and offers valuable additional information.

In 2004 and 2008, accomplishments and progress were described in so-called Progress Reports. The government asked non-state actors to participate in these Progress Reports, in the form of an open Internet consultation, by giving statements on a draft consultation paper for the report. Various governmental and non-governmental actors prepared statements that were included in the 2008 Progress Report, *inter alia* the parliamentary Advisory Council on Sustainable Development, econsense, and the Confederation of German Trade Unions (DGB). The Progress Report is then submitted to the Parliament and subject to debate. In the 2008 report, there are some reforms envisioned for the near future regarding sustainability management. One example is the increased frequency of meetings of the Committee of State Secretaries. Experts and stakeholders are invited to par-

ticipate in these meetings. The committee initiated a new process for the different departments to prepare and publish reports on their implementation efforts. Eventually, each department will release a report, but this has not happened yet. So far, there has not been a systematic review of existing legislation, programs, and budgets in regard to their SD impacts. As part of the latest Progress Report, the government decided to include SD aspects in the generic Impact Assessment (IA) system for new legislation. The specific implementation and design of this ex-ante appraisal is to be decided (Jacob et al. 2009).

The view of experts: Sustainability Impact Assessment

Some experts express hopes that the recently introduced Sustainability Impact Assessment (SIA) on new legislation will considerably improve the relevance of the strategy. The departments are then forced to take both SD issues and the national strategy into consideration.

Other experts from within government are more sceptical. Although the SIA could potentially unfold integrative effects, a fundamental change of governmental practice should not be expected within the government. Only if the parliament becomes involved and if it reconsiders legislative proposals because of the results of the assessment, the process will be effective.

Several representatives from ministries share this scepticism about the SIA, fearing that it will be performed in a formalistic way, that the administrative capacities are missing and that there is the risk of a slowdown of the legislative process. Extensive checklists cannot be expected to be applied. Furthermore, it is left open what role an impact assessment could play in cases of political pre-commitments. An extension of the assessment beyond legislation, e.g. on programs and strategies is met with scepticism as well. The assessment does not replace the regular interdepartmental consultation, negotiation and decision making. It cannot be expected that the assessment will be applied to strategies, as it is the case in the European Commission.

One interviewee suggested assigning the Federal Chancellery with a watchdog responsibility over the assessment in the department. This would contribute to a strengthening of the Chancellor's influence.

The view of experts: The overall assessment of the strategy

The concreteness of the goals of the strategy is judged favourably. The goals are perceived as ambitious. However, it is pointed out that it is necessary to find a balance between achievable objectives (to demonstrate the successes of policies) and ambitious goals that provide incentives for additional efforts. Representatives from the administration point out that, from the point of view of ministers, those objectives that are not achievable or sensitive to political steering are perceived as unattractive or undesirable. Still, ambitious goals are perceived as a driver and incentive for governmental activities. The strategy's management by objectives and results is perceived as revolutionary for

German political culture. A revision of the indicators representing wealth and prosperity would be desirable.

The Länder (federal states) were not involved in the development of the goals and indicators. As a result, the strategy should be considered to be a government strategy rather than a national strategy. The Länder insist on keeping their domains of responsibilities and show apprehension about implementing the strategy. This changed recently, however, as indicated by the formation of the new Federal-Länder working group. Since then the state and federal governments have committed themselves to a closer collaboration. The Länder will be invited to participate in the implementation of the strategies and the further development of indicators, but the federal government will keep the final responsibility.

Overall, the strategy and goals are increasingly accepted by the Länder. The prevailing opinion is that by incorporating more participants in the negotiation of the strategy, the level of ambition may decline. Thus far the management rules of the strategy are perceived as less important than the specific goals. However, in the SD debate more and more references are made to the management rules.
One issue of discussion is the extent to which the strategy should be made more legally binding. Representatives from business point out that a higher degree of binding would be possible if a watchdog group oversaw implementation and the legislative process. The watchdog could potentially be a forum that broadly represents the population, works with the Chancellor, and is more than just an advisory committee. The Council for SD could be transformed in this direction. It would be desirable to have not only individuals providing advice but also the ability to impose sanctions.

From the viewpoint of enterprises, the strategy does not provide impulses for action; a clearly defined goal is lacking and there is no role defined for companies.

Some interviewees claimed that the strategy lacks concreteness and action programs. The strategy is not being put into practice so far and is not sufficiently implementation oriented. Furthermore, the concrete steps of implementation undertaken by the federal government should be more visible tied to the strategy. In addition the ministers should communicate this to the public.

The interviewees estimated that the strategy had a low impact on the general public and it is hardly known. The federal president could play a role in communicating and promoting the strategy. The progress of SD policies has been criticised by the Council for SD in its statements for the 2004 and 2008 progress reports. According to the Council for SD, the strategy and its implementation are not sufficiently guided for the development of federal policy or actions of societal actors. The strategy and actions for implementation are neither of a binding nature nor sufficiently concrete. Although the efforts to increase the effectiveness of implementation were acknowledged, the lack of administrative capacity is a noted bottleneck.

The management concept does not entail specifications of measures or resources to be allocated for the implementation of the strategy (SRU 2008). The German Advisory Council on the Environmental (SRU) has proposed increasing the administrative capacities in particular within the Chancellery (SRU 2008: 40). The allocation of resources and the development of measures are largely the responsibility of the departments.

The strategy introduces quantitative targets and timetables that allow for the steering of complex policies (Bundesregierung 2008a: 37f). In Germany, "management-by-objective" is a rather new role model for administrative implementation of policies (as opposed to authoritative top down implementation). It entails an ambitious and innovative management concept, which potentially mobilises and coordinates the activities of a wide range of actors in different issue areas. According to some expert interviews, to harvest these benefits and other co-benefits, SD policies have to receive resources and have to be supported by more specific measures. Others advocate a more focused approach, with few top priorities for SD policies rather than an all-encompassing strategy. So far, the loop of advice—consultation to quantitative objectives to monitoring to reporting to additional measures—is not being conceptualized nor has it been used sufficiently for policy learning within mainstream policy domains. Some progress has been made in terms of the management approach in the 2008 progress report, but it remains open if the innovations such as the reformed committee of secretaries of state or the SIA will be ambitious and effective enough.

3.3. The Institutional Set-up of SD Policies

The institutional framework set up for SD policies in Germany, entails:

- coordination in the Federal Chancellery,
- the Committee on the level of State Secretaries (deputy ministers) with a working level support of senior officers,
- the German Council for Sustainable Development,
- the Parliamentary Advisory Council on SD, and
- the Federal-*Länder* committee on the level of heads of cabinet offices (since late 2008).

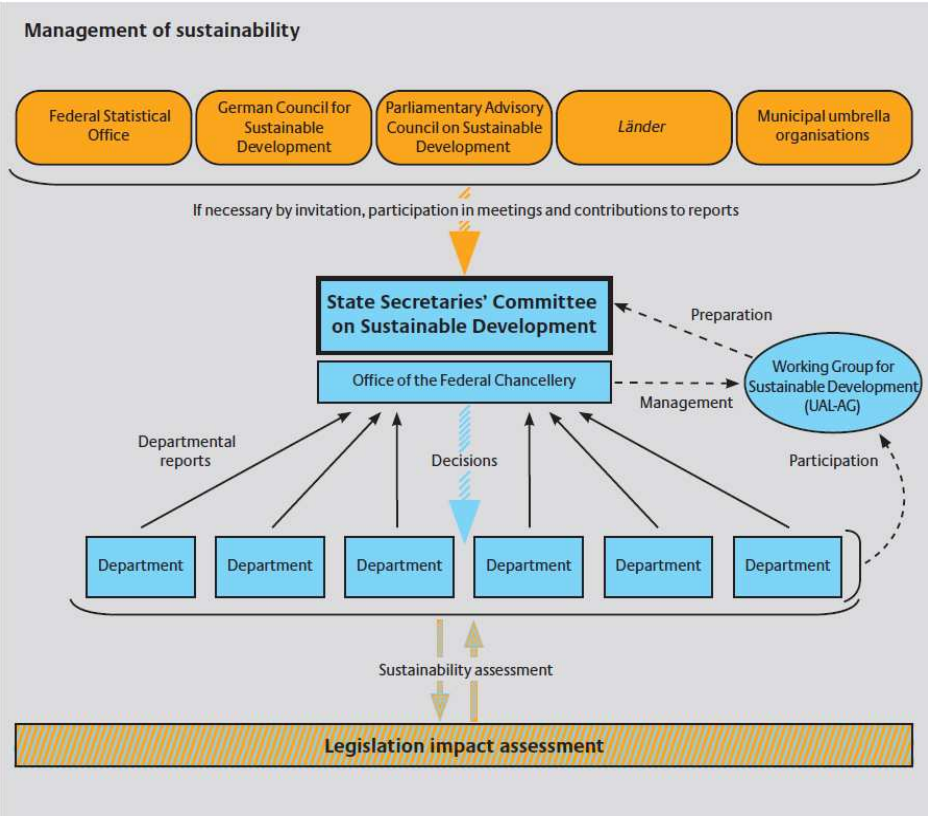
The following figure (Figure 1) shows the different institutions and their interplay as seen by the Federal Government.

Traditionally, the **Federal Chancellery** has no substantive responsibility for policy areas but only a coordinating role, while the policy preparation is in the domain of the minis-

tries. This is different for very few issues, including SD for which the Chancellery takes on political leadership (Volkery 2004). The Chancellery is organised in units mirroring the departments. There is no dedicated unit for SD, but instead the responsibility is in the unit responsible for environmental policy. The unit's work is highly valued by representatives from other departments and it is widely acknowledged that there is no bias at the expense of non-environmental issues. Still, many observers believe a specific unit and an increase in staff would be beneficial for SD policies (SRU: 2008; Parliamentary Advisory Council on SD 2008: 3). The Council has also underlined this.

The **Committee of State Secretaries** was founded in 2000 and was originally composed of a subset of departments with high relevance for SD. The committee has since been expanded, and now all departments are represented. Before 2008, 1-3 meetings per year took place. Despite the high political level of the committee, little momentum was developed in the first years of SD policies. With the preparation of the most recent Progress Report (2008) the State Secretaries increased the frequency of meetings and asked the different departments to report on each other.

Figure 1: Management of sustainability



Source: Bundesregierung 2008a

The meetings are prepared by a standing working group of senior officers from the departments (Bundesregierung 2008a: 29). Although the name of the working group indicates representation on the level of deputy directors, in reality the working groups are often comprised of people below this level. Most often, the departments are represented by heads of units or policy officers. Members of the group report good personal relations among the members. It is perceived as an asset that it is a standing committee with permanent representatives and not an ad hoc committee as is the case for other policy dossiers in Germany.

The view of experts: The coordinating role of the federal chancellery

It is the opinion of the vast majority of experts that placing the responsibility for coordination of sustainability policies within the Federal Chancellery (Bundeskanzleramt, BK) is a huge advantage. This ensures that the topic is being dealt with in a cross-departmental fashion. There are only a few critical voices against coordination through the Chancellery. Very seldom, experts stated that the topic is somewhat dominated by environmental concerns because it is the responsibility of the mirror unit for the environment; the majority of experts, however, believe the topic is handled in a balanced manner. Some experts note the limits of administrative capacities within the Chancellery. When other environmental issues enter the agenda, sustainability falls into the background and is not developed any further. The Chancellery itself notes this as a problem. A few experts mentioned that the Chancellery lacks professional competencies regarding the topic. That can only be provided by the ministries and their staff. Therefore, the Chancellery should only be in a coordinating role and cannot push certain issues on itself. Another function of the Chancellery is mediation of conflicts between the ministries; its performance in this regard is seen as quite positive.

To further improve the process, several interviewees recommend the creation of a dedicated unit on sustainability inside the Cabinet. This recommendation highlights the overarching importance of sustainability inside the Chancellery.

Within the Chancellery, the Head of the Federal Chancellery plays an important and active role and personally participates in ongoing discussions.

The German **Council for Sustainable Development** (RNE) was created in 2001 by a decision of the Parliament. Representing NGOs, the business community, academia, churches, societal organisations and the media, the members are appointed *ad personam* by the Chancellor after consultation with the ministries. Currently, the Council has 15 seats, and due to reassignments, it has 13 members. The RNE reports directly to the Federal Chancellery. Its main task is to advise the government on the implementation of the SD strategy and to initiate public dialogue and attention on SD issues (Bundesregierung 2008a: 29). The Council disposes of a secretariat with a staff of eight full-time employees. In addition, some resources are available to commission studies. Among the most

visible activities is the organisation of annual conferences with stakeholders and political actors.

Some experts presumed that topics provoking conflicts would be dealt with outside the coordinating bodies of the Sustainability Strategy. Some sought to explain this by stating that the committees could not play a supervisory role over other governmental bodies. The regular decision-making procedures within parliament and government cannot be abrogated. The role of the committee is to stimulate discussion and also coordinate SD policies in the narrow sense; the committee is not to deal with all policies.

The RNE works on a couple of specific political issues such as energy and climate, corporate social responsibility (CSR), public procurement, consumption and production patterns, and land use (RNE 2006a). The Council provides advice to the government and often uses rather innovative forms of dialogue to prepare recommendations: The one hundred youngest local Parliamentarians discussed how to redirect SD issues between the different political levels. Other formats include CSR Leadership fora, expert dialogues on sustainability labelling, and practitioner meetings in land use (Niestroy 2007). These recommendations have an impact on the government, and stakeholders take them into consideration carefully (Niestroy 2005). The RNE has an operational power that was recently used to organize the *Mission Sustainability* project and a couple of new cooperation projects with federal departments.

The view of experts: Interdepartmental coordination

The higher frequency of meetings of the Committee of State Secretaries, the topical focus and the reports from the departments are perceived as an upgrade for the committee. Before this reorganisation, the committee had little influence and hardly any momentum. The prevailing view was that the State Secretaries had been giving SD a low priority. Now, however, new ideas are developed during the meetings.

Collaboration within the Supporting Committee of Heads of Under-Directorates (Unterabteilungsleiter-Arbeitsgruppe, UAL AG) is described as sometimes conflicting, though constructive. Conflicts are put on the table, but they do not escalate into fundamental disagreements; one reason for this might be the long-lasting collaboration of the individual members of the UAL AG. The workload is perceived as high, and all participants have other responsibilities beyond SD issues. For an increase in productivity to occur, additional administrative capacity would be needed.

In spite of UALAG's name referring to senior officials, some ministries have appointed lower-level staff. These members are seen as competent, professional and able to represent their institutions; yet some interviewees suggested that the presence of lower-level staff might indicate a lower priority within some ministries.

One important task done by the committee is processing a monitoring list, in which 120 measures of the Second Progress Report are listed. These measures have to be fulfilled by the respective ministries, and implementation checked by the UAL AG.

As our expert interviews show, the role of the RNE is highly valued by observers. In conjunction with the Federal Chancellery, it is perceived as the leader of SD policies in Germany (Statz 2009: 85). The Council's activities are perceived as critical to government policies; this is much appreciated and recognized as a driver also within the government. Yet the RNE does not take (public) positions in day-to-day political debates. On some topics, the Council has commissioned studies to gather and to assess scientific knowledge on certain issue areas. Overall, however, the Council does not position itself as a body for scientific advice.

The view of experts: Council for Sustainable Development:

The Council for Sustainable Development (RNE) is consistently recognised as an important actor within the sustainability discourse in Germany. It is perceived as a driving force and has the ability to set the agenda. Various functions are attributed to the Council: setting the agenda, acting as a controlling agency, representing civil society and providing public communication and advice to the government. The experts vary in their opinions on whether the Council should strengthen any of its functions.

It is perceived to be advantageous that the RNE takes a critical stance and promotes approaches that are not yet mainstream. RNE's criticism is recognised and considered in all ministries. Overall, the criticism is perceived as constructive, and occasionally is perceived as too moderate.

The inter-ministerial working group of directors (UAL AG) is believed to have a good relationship with the Council. The cooperation with the business association econsense has significantly improved. The collaboration with the German Association of Cities (Deutscher Städtetag) has also improved. Virtually no relation exists with the scientific advisory bodies (i.e. the German Council of Environmental Advisors (SRU), the German Advisory Council on Global Change (WBGU) and the coordination body for the UN-Decade).

Generally, the scientific community and its institutions should pay more attention to issues of SD. A better integration of the scientific community into the Council is seen as desirable. Members of the Council also proposed to establish better communication with other national sustainability councils from abroad and to increase discussion of international issues.

The role of Volker Hauff, the chair of the RNE, and Klaus Töpfer is predominantly positively viewed. Internally, there are disputes on issues and on the management of the Council, but there are no fixed coalitions. Many observers evaluate the secretariat of the RNE positively.

Some observers suggest that the Council should take a more important role in policy-making. It is suggested that the Council could be upgraded to that of a watchdog body, and also be located directly in the Chancellor's office.

Different views have been expressed on the optimal size of the Council: Some express the view that it and the represented spectrum are too narrow, and, as a result, workload for its honorary members is too big. The Council's narrow inclusion, some experts believe, leads to an omission of topics due to lack of representation. For example, the social sector and the European level are not sufficiently represented. On the other hand, another expert proposes a markedly smaller council of only five persons. The capacities of the council members could be increased by introducing personal assistants.

Others propose a permanent seat for RNE in the Committee of State Secretaries. Another proposal is to hold joint meetings with the Federal Cabinet one or two times per year (former RNE). The **Parliamentary Advisory Council on Sustainable Development** is a relatively new means of involving the Parliament in sustainability policies. It requires a renewed mandate after each general election. It has 20 full members and the same number of alternates. It was founded in 2004 despite opposition from the CDU/CSU. After a unanimously renewed mandate in 2006, the Committee is well established and has the reputation as a constructive collaboration that works beyond party lines (Bundestag 2006).

Overall, the institutional framework has been developed both on an administrative level as well as on a political level in government and Parliament. However, the institutions are not sufficiently utilised, nor are they equipped with the administrative resources to address their tasks or mainstream SD into day-to-day politics.

The view of experts: Parliamentary Advisory Council on Sustainable Development

The Parliamentary Advisory Council on Sustainable Development (Parlamentarischer Beirat, PB) has been described by several experts as potentially quite relevant, yet rarely visible or present so far. It lacks a clear role, a solid institutional basis and good visibility. Its anchoring within the parliament and its influence on other committees are seen as weak by several interviewees. Compared to the PB, the role of the Enquete commissions (parliamentary commissions composed of Members of Parliament and an equal number of experts) on SD was more relevant according to some experts.

A limiting factor for the effectiveness and visibility of the parliamentary council is the scarcity of time of parliamentarians, as well as a lack of administrative support. Furthermore, a clear division of work between the PB and other committees would be desirable. The recently introduced sustainability impact assessment for new legislation is credited to the activities of the parliamentary council. But overall, the PB is being attributed few

impacts only. However, if the council takes over an active role in the Impact Assessment process, there is a chance to promote the council and to increase its relevance.

3.4. SD Policies and the Subnational Level

Within sustainable development (SD) policies a clear separation of power does not exist between the federal level and the *Länder* (federal states). Furthermore, there is no significant cooperation or networking capacity. While *Länder* are responsible for implementing federal policy, they are also free to develop their own policies within their constitutionally guaranteed and recently even enlarged domains of responsibility, which can differ from the federal initiatives. The German SD strategy was originally developed by the federal government without any involvement by the *Länder* and municipalities. However, all actors acknowledge the need for coordination across levels.

Initially, this coordination was within a working group for SD policies on the administrative level (Federal-*Länder* working group "Nachhaltigkeit"). It works within the institutional framework of the Bund-Länder-Conference of ministers for the environment (UMK). This reflects the fact that SD is thus far the responsibility of the environmental departments in all of the *Länder*. In November 2007 the UMK decided to downgrade this working group; it is now a Federal-*Länder* working group—"Climate, Energy, Mobility – Sustainability"—and it has operated since January 2008. Sustainability is addressed within this framework as an ad hoc sub-working group. Integration of this working group across disciplines and departments is weak.

After the NSSD re-launch in 2008, the federal government initiated a new committee under the auspices of the Federal Chancellery in December 2008. The committee, still in its initial phase, includes the cabinet offices (instead of the environmental ministries) in the *Länder*. During its initial phase the committee focuses on a selection of shared-responsibility issue areas (land use, public procurement and indicators). By launching this new committee, the attention on SD increased among the heads of *Länder* governments. Furthermore, the Committee of State Secretaries met with representatives of the associations of municipalities specifically to discuss the issue of land use. This meeting was well perceived by the local authorities. However, the municipalities have more issues on the agenda—in particular, their large share in public procurement (ca. 60 percent of the total procurement is the responsibility of local authorities).

Most of the *Länder* and a number of local authorities developed or relaunched their specific SD policies. Some of them—for example, Bavaria, North-Rhine-Westphalia and Baden-Württemberg—launched SD initiatives even before the federal government took action (Kern 2007: 122). Today 12 of the 16 *Länder* have developed regional SD strategies

or action programs; the most recent processes have taken place in Lower Saxony, Hessen and Schleswig-Holstein. Among the most experienced and broad-scoped processes is the one in Baden-Württemberg, where special emphasis is given to the participation of actors from civil society and municipalities. The strategy is less concrete with regard to the objectives, but very specific in regard to dedicated projects. Rhineland-Palatine and Berlin, on the other hand, have a very systematic approach of integrating the different aspects of sustainability. Hessen is about to follow the lead of Baden-Württemberg in its NSSD process. In other Länder, the process was not sufficiently institutionalised and has been weakened or taken from the agenda after changes in government (e.g. North Rhine Westphalia, Hamburg, Mecklenburg-Vorpommern).

SD policy at the level of German *Länder* is, in contrast to federal SD policy, predominantly operated by the Ministries for the Environment (with the exception of Baden-Württemberg and Hessen where those processes operate under the auspices of the Prime Minister). This often causes the perception that SD is primarily an environmental issue. As a result, SD becomes pulverised in a competitive struggle between the departments (Statz 2009: 85). This indicates that there are some activities to lift up the issue of SD within the political hierarchy. Many *Länder* have supported the local municipalities' SD activities. The forming of local agenda initiatives and the adoption of Local Agenda 21 (LA 21) resolutions and concepts by local parliaments and authorities accumulated in Germany between 1997 and 2002 (Kern et al. 2007: 608). However, today these LA 21 processes appear to have lost their importance—not only in terms of the number of municipalities that have adopted new resolutions, but also in terms of their implementation. Research has shown that these processes suffer from political marginalisation (Geißler 2007: 494). Nevertheless, they have impacted a variety of new initiatives, which continue the work in specific issue areas (e.g. local climate action plans) and without direct reference to LA 21 processes (Hoffmann 2005: 8; Geißler 2007: 488).

The view of experts: SD policies in the *Länder* and municipalities

The institutionalized cooperation between the Federation and the *Länder* established in December 2008 is evidence of considerable progress in high-level relations. Before this, the NSSD had hardly any effect on the SD policies of the *Länder* and the local authorities. So far, the responsibility for SD issues in the *Länder* is assigned to the Ministries for the Environment. The new committee, composed of the heads of the state chancelleries and the federal chancellery, accentuates the cross-cutting nature of sustainable development. Furthermore, the high-level committee is more likely to have impacts on political decisions within the *Länder*.

The committee agreed to focus on a few selected issues first; these issues reflects shared responsibilities at the federal and the *Länder* levels (e.g. public procurement and land

use). The focus on main topics within the meetings is seen as reasonable, not just in order to avoid a mutual blocking. However, the selected topics are seen as only a beginning. More issues need to be addressed in the future. Different views have been expressed whether the relevant actors will show willingness to discuss issue areas, which are in the sole responsibility of the *Länder*, such as education policies. While some expressed doubts, others reported good cooperation between federal level and *Länder* concerning the topic "education for sustainable development" and therefore have a more optimistic view on this question.

Regarding the topic of public procurement, the local authorities have stated that they are not involved in a sufficient enough way—despite the fact that they represent 60 percent of the German procurement volume. This is seen as a strategy of the *Länder* to limit the influence of the municipalities. A different explanation for not inviting the representatives of the municipalities is that it could potentially result in too many participants. Concerning the topic of land use, a consensus is not visible. Interests vary considerably among the *Länder.*

Up to now, the local authorities are hardly integrated into the SD process. Recently, representatives of the German Association of Cities (Deutscher Städtetag) were invited as experts to a meeting of the Committee of State Secretaries. This is perceived as an improvement, but it is not seen as sufficient. The experiences of the cities and municipalities have not attracted much interest among the *Länder* and federal authorities thus far. On the other hand, in the past, organizations like the German Association of Cities (Deutscher Städtetag) have not been very active. Because of the rising importance of SD issues, however, this is expected to change in the future. To further support this outcome, the RNE could play an important role in breaking down issues from the European to the local level. A mechanism to link the federal and the local level, however, is presently lacking.

The municipalities face serious financial constraints. Often, because of structural reasons, the SD officers—if there is an SD officer at all—are isolated from daily politics within the administration. SD is often perceived as more of an environmental issue than as a cross-sectoral issue. Due to the mentioned constraints, the linkage between LA 21 activities of civil society and the local authorities is rather weak.

A similar situation can be observed on the federal level: The federal SD strategy is poorly linked to processes of LA 21 and, as mentioned above, local authorities perceive the national process not to be important to their own SD policies (Hoffmann 2005: 4). In some distinctive areas, especially with regard to the 30 hectare goal of land consumption, the SD strategy provides the impetus for the development of innovative land policies (through research and development programs), stirs up discussions at local level and serves as a (however informal) benchmark for the development of local land use plans (Hoffmann 2005: 4). Until today, the 30 hectare goal remains a massive point of conflict

between the federal and the local level: As the federal Government stresses the SD goal, the local authorities emphasize their sovereignty in planning and their financial interests in regard to the development of land use policies.

In contrast to the observed decline of LA 21 processes, municipal climate protection activities and associated international networks appear to be gathering momentum. These activities especially focus on energy efficiency and renewable energy development but also take in account sources of CO_2 emissions like transport. With regard to climate protection activities, a stronger vertical cooperation between the federal level and the local level can be observed. The federal environmental ministry, for example, has been supporting local activities for climate protection through special funding programs in the framework of its climate protection initiative since 2008. These support mechanisms intend to counteract the most cited shortcomings of local climate protection activities: The insufficient financial strength of municipalities, which has prevented them from tapping their potential.

3.5. The Role of Non-State Actors in SD Policies in Germany

The Role of German Companies and Business Associations

Germany has a number of business associations such as econsense, Initiative 2° and the German Global Compact Network, which are mostly comprised of globally active German companies that aim to promote SD within the business community. In fact, these associations are mainly platforms for exchanging information, experience and contacts, and do not generally take a lead in the debate on sustainable patterns of production and consumption or in corporate social responsibility (CSR).

Econsense, which comprises 24 German companies listed in the DAX, concentrates on networking among its active members instead of mainstreaming SD in its umbrella organisation, the BDI (Federation of German Industries). The ambitious plan to reach out into the business community has not yet been achieved. This corresponds with the concerns expressed by some experts in the interviews that CSR-departments face barriers in reaching mainstream players within their respective companies. Furthermore, there is a wide variation of commitment within the business sectors.

To take another example, the German Global Compact Network relies currently on the German Agency for Technical Cooperation (GTZ) for coordination and on the German state for financing. Even though a foundation is expected to cover its funding, the Network will still be dependent on the German state, as a major financial contribution is expected to come from the government. Its Steering Committee consists of a diverse group of societal actors, which ensures a relatively neutral and productive atmosphere. The

Network defines itself as a communication forum in which discussion and learning are of pre-eminent importance; the actual contents of discussion forums are not publicly available. The association thus creates momentum for cooperation, but often has little to do with actual implementation. As a result, its precise achievements lack transparency and it still does not play a leading role in the sustainability debate. For example, the Network failed to participate in the formulation and review process for the sustainability strategy.

Big companies generally dominate the above-mentioned business associations and small- and medium-sized enterprises (SMEs) are often not well represented. SME associations such as UnternehmensGrün and B.A.U.M. e.V., for example, concentrate mainly on networking and exchange of experience. They do not publish papers or statements relating to SD and do not participate in the strategy process. Therefore, SMEs are only involved in a limited way in the SD debate.

The expert interviews revealed, however, that small- and medium-sized companies often develop sustainable markets and manage their business "innately" in a sustainable way, especially in the case of family businesses. They show by means of concrete cases that business can be run in a different, more sustainable manner, and can thusly motivate politicians to defy lobbyism and to set the right framework. Despite having the ability to develop niche markets, pioneering SMEs are often limited in terms of capacities and possibilities when it comes to the promotion of sustainable business cases or the influence of politics in this area as seen above. Furthermore, SMEs do not have the same leverage that big businesses do. Other small- and medium-sized businesses, do not realise the benefits that sustainability may have for their company.

CSR activities are widespread in Germany, but mainly uncoordinated. The expert interviews revealed that the variety of initiatives tend to hinder rather than promote the diffusion of CSR. Competition is ineffective, and some critics consider many of the activities to be little more than feel-good events. For the majority of SMEs, the concept of CSR remains unknown, even as they show commitment to topics relevant to CSR (TÜV Rheinland 2007: 8).

The expert interviews highlighted a need for the state to set a supportive framework for CSR. Public procurement could play an important role in this context in order to set a good example and to claim action from business. Another idea is to publish a report by the government on CSR activities that highlights best practices.

The German Council for Sustainable Development has taken the lead in conceptualising CSR within the national context (RNE 2006b). The Council supports a regular ranking of CSR reports carried out by the Institute for Ecological Economy Research (IÖW) and future e.V. (see http://www.ranking-nachhaltigkeitsberichte.de/). In 2009, for the first time,

small and medium enterprises will be included in cooperation with the Federal Ministry for Labour and Social Affairs. Another benchmarking project is the German Sustainability Award, an initiative by private actors that will be supported by the RNE and by econsense in 2009 (see http://www.deutscher-nachhaltigkeitspreis.de/).

The Federal Ministry for Labour and Social Affairs has recently initiated a national CSR Forum (see http://www.csr-in-deutschland.de/portal/generator/1836/startseite.html). It remains to be seen whether such a forum might help align the currently disparate CSR approaches of the federal ministries. Within the forum, several federal ministries are actively engaged. However, expert interviews showed that, during the initiation of this forum, criticism arose because of the perceived lack of transparency concerning the selection of non-state members as well as a lack of vision for the future.

German companies have reacted differently in the wake of the economic crisis. Interviewed experts reported that some companies have delayed any expenditure on social or environmental actions, while others felt the need to strengthen their activities even more. Pioneering companies that could set a course politically often lack the necessary channels to do so. The reluctance of political actors to access business knowledge beyond traditional lobbying further contributes to this barrier.

In an international comparison of commitment levels to CSR, German companies rank among the highest. In the Dow Jones Sustainability Index, for example, German companies accounted for 3 of the 19 global “super sector leaders” in 2008 (Dow Jones Sustainability Indexes 2008). Predominantly, the companies leading in terms of CSR commitments coincided with the ones leading in their overall sector. This outcome was true especially in critical sectors, such as chemistry, in which regulators are encouraging transparent reporting.

According to the expert interviews, the majority of German enterprises still consider CSR a risk minimization strategy. These enterprises do not view CSR as a business case for companies, or as useful to strategic management. Oftentimes, businesses ignore CSR altogether or they treat it merely as philanthropic action. In the expert interviews it was noted that CSR is a communicative “must-have,” yet the debate within the companies is led only superficially. Some experts expressed the perception that in big companies the board members often only have a rough understanding of the term and that CSR is not a driving force. Other voices confirm an increase in the number of businesses that care about the credibility and success of their CSR commitment. Good practices can be found in numerous companies (see boxes).

Good practices of sustainable business:

The drugstore „**dm- Drogeriemarkt**" was founded in 1973 and today is the second largest drug store in Germany. By now it also operates in nine other European countries. The company sets good examples, besides others, in the area of employment and training. The working hours for instance are being set flexibly and individually in accordance with the colleagues. Furthermore dm's concept of on-the-job training has received several awards already. The dm concept "Lernen in der Arbeit (LidA)" ("learning at work") has practical orientation and supports the independence of the trainee. Not only trainees but also every member of staff is offered different courses focused on holistic education of the individual, such as courses in various art forms.
(http://www.dm-drogeriemarkt.de/dmDHomepage/generator/dmD/Homepage/Unternehmen/Nachhaltigkeit/5Mitarbeiter/Mitarbeiter.html)

The paper producing company **Steinbeis Papier Glückstadt** GmbH & Co. KG was awarded with the German Sustainability Award in 2008. Since the 1970s the company has produced paper completely from scrap; and since 1995, it has produced recycled paper only. It thus stands out in terms of climate and resource protection.
(http://www.characterbrilliant.com/deutscher_nachhaltigkeitspreis.98.html)

The **Elektrizitätswerke Schönau** (EWS) (electricity plants Schönau) were founded by a citizens' group after the Chernobyl accident in 1986, and they supply 86,000 households in Germany today. The company produces and purchases all its electricity from renewable energies and sticks to strict internal guidelines, such as transparency and climate protection. In 2008 the Social Entrepreneur award of the Ashoka initiative was presented to the founder and manager Ursula Sladek for highlighting the concept of citizen participation and promoting the use of environmentally friendly energy.
(http://www.ews-schoenau.de/fileadmin/content/documents/Mitwissen/Pressemitteilungen/081106_Ashoka_PM.pdf)

The view of experts: SD in business

The sustainability strategy receives attention mostly in large companies, where the topic has already been placed on the agenda. However, the strategy does not affect these companies directly; there are no major advances being attributed to it. Instead of a direct power, it has more of a legitimizing effect. A specific German role for clean technology could and should be defined within the strategy. On the national level there are too few incentives for business.

CSR strategies are often largely for the sake of public relations and seldom play a role in the core business strategy of companies. The topic is not sufficiently relevant for CEOs. In the past, there were examples of conflict between the company PR as it is spelled out in the CSR strategy and the actual business practices. Only in a few companies has CSR been introduced to encourage innovation. Other companies, however, view CSR primarily

as a risk-reduction strategy. A report on CSR activities published by the German government could identify and support best practices of CSR.

Overall, a growing demand for CSR certification can be felt. However, currently there is an excess supply and a fragmentation of CSR initiatives. The sensitization of sustainability has been successfully achieved; however, willingness to act is still much too low. In the present financial crisis, there are two prevailing mindsets: on the one hand, there is the position that CSR is increasing in importance and application; but on the other hand, there is a belief that there are simply no funds available for CRS.

While the companies have many ideas, very few of them have actually been implemented. CSR should not just appear in corporate reports, but, rather, should become an integral part of core management and business operations. However, attempts to incorporate measurable indicators for CSR have been rejected by companies. The federal government initiated a process to coordinate and to promote CSR activities under the umbrella of the CSR Forum. Some observers complain about the assignment of roles within the forum and the selection of members.

Several interviewees complained that the SMEs do not have a forum and are not being addressed to a sufficient degree, even though the great potential for innovation is acknowledged. In particular, there is no representation among the business associations. At the same time, there are numerous "hidden champions" among the SMEs, which need to be identified and promoted otherwise they might fail in the current economic crisis.

The framework conditions by the state could deliver more incentives for further diffusion, but these frameworks remain rather cursory. A levering function could be achieved by the financial markets and therefore also within financial market regulations, which up to this point have not been fully utilized. Overall, the economy is lacking clear directions, signals, boundaries and solid specifications. Appeals alone are not enough; instead, rules are necessary. The examples by pioneers could also be used to develop new possibilities for action taken on the state level.

The Role of Civil Society

The traditional role of NGOs is to stimulate debate in society, raise awareness of certain issues, mobilise the public and generate political pressure. However, many NGOs now prefer a more cooperative strategy, trying to get big companies and organisations on board for concrete programs (e.g. WWF 2009; NABU 2009). Moreover, while NGOs led the discussion on SD in the early 1990s, business and politics have dominated the field in recent years. This may be due to interference by business: As the expert interviews have shown, some NGOs believe their original ideas to have been distorted and no longer participate in the wider debate. However, this does not apply to all NGOs. For instance, the large environmental associations BUND (Friends of the Earth), NABU and DNR pursued a joint SD project financed by the Ministry for the Environment but politically independent. The project is heavily involved in the SD debate, an in efforts to promote the topic

via conferences and publications (DNR 2009). It aims to educate environmental NGOs in the broader context of sustainability. Another project initiated by NGOs is the annual networking and training conference for local sustainability initiatives, the Netzwerk21Kongress (see http://www.netzwerk21kongress.de/). This conference has taken on the responsibilities of local agenda groups, since the operational office of those groups closed down. The conference will continue to govern until new structures can be established. However, a timetable for such a goal is still unforeseeable. In the course of the Netzwerk21Kongress the German Local Sustainability Award ZeitzeicheN is bestowed to outstanding persons, enterprises or initiatives. According to the expert interviews, the formation and review process of the sustainability strategy also involved a broad spectre of NGOs, including also associations for consumer protection (Bundesregierung 2008b). With regard to the 2008 Progress Report, the influence of this participation in the consultation processes has increased. However, some NGOs have been disappointed that this did not lead to them being included on a regular basis in SD policy-making processes.

Trade unions have been rather hesitant to join the SD debate so far. There is a long tradition of disputes over the importance of environmental affairs within workers' organisations. This comports with the insight revealed in the expert interviews that environmental issues were for a long time perceived as a possible threat to employment and income. Yet together with environmental associations and other actors, they have been responsible for a number of initiatives (e.g. the "Bündnis für Arbeit und Umwelt" – Alliance for Work and Environment) and new labels (e.g. the Forest Stewardship Council and other labels) (DGB 2001; IG BAU 2009). But the picture is inconsistent, with some unions playing an active role—IG BAU and IG BCE, for example—and others playing more passive roles. As shown by the expert interviews, the main approach of German trade unions is to use their existing structures and direct relations with CEOs rather than participate in multi-stakeholder discussions. Thus they are not represented in the German Network Global Compact, for example. They have also failed to participate in the CSR debate in Germany so far; this might change, however, with the recent initiative for a coordinated CSR policy (see above).

Germany's two major Christian denominations, the Catholic and Protestant churches, have traditionally focused on areas such as development cooperation and poverty alleviation. Their involvement in environmental protection and climate change issues stems from a desire to protect what they see as God's creation. Their emphasis is clearly on environmental rather than economic aspects. Examples include the EMAS certification of the World Youth Conference in Cologne in 2005 and the CO_2-neutral synod in Dresden in 2007. Both the Catholic and Protestant churches have appointed environmental officers.

In addition, European church institutions developed a sustainable management system based on the European system EMAS and the CSR concept, called EMASplus, which is being implemented in about 50 German institutions (see http://www.kate-stuttgart.org/content/e823/index_ger.html). In total about 500 church institutions in Germany have an environmental or sustainable management approach. In 2005, the two denominations developed a joint guideline for "sustainable preaching" aimed at raising awareness about SD issues. In 2009, they also initiated the project "Zukunft einkaufen – glaubwürdig wirtschaften in Kirchen" (Future shopping – credible economic activity in churches) together with other religious bodies (see http://www.zukunft-einkaufen.de/). However, the churches are to some extent sleeping giants that have yet to realise their full potential to influence products and manufacturers.

Expert views: Sustainability in society

The prevailing view of the experts is that the society does not – or not in a sufficient way – take notice of sustainability as a theme and as a guiding principle for action. In general, a more active role for civil society actors appears possible and would be beneficial. Several experts underscored the need to develop information campaigns for the general public. Small and concrete projects in the fields of energy, mobility, building insulation, and consumer behaviour, which involve the local population, could contribute to changes in behaviour. Such projects should be supported by the Federal Government in efforts to create policy framework conditions. A different explanation of civil society's insufficient participation is sought for the strategy. An increase in the importance of government action would likely draw attention to non-governmental organisations.

Several interview partners observed a change in policy style in federal policy development: The involvement of civil society actors into policy formulation is found not only within actual sustainability policy, but also within other department policies. Also the newly founded CSR forum can be seen as an example of the broadening of stakeholder involvement, but it is not coordinated within the institutions of the NSSD. However, the broadening of participation is not taking place in all departments as some experts complain. The advanced involvement of civil society actors could be explained with a stronger project/campaign orientation of the Federal Government. Policy development no longer focuses only on legislation, but also on other forms of policy output (e.g. projects, campaigns, etc.). Such policy approaches are perceived to be more open to the involvement of civil society.

Regarding advanced involvement by civil society actors, the *Länder* could play a prominent role according to some experts. While the Federation is perceived as being too far away from the actors and the number of actors is too high, the *Länder* have a good chance of achieving involvement through their strategy processes.

Only a minority of labour unions have picked up issues of sustainability, whereas an opening for environmental can be noticed. The dominance of environmental issues in the sustainability discourse in Germany is seen as an obstacle to comprehensive engagement of

the labour unions. A similar situation is reported for the churches. However, in the parishes there is an increasing awareness of SD issues—in particular, issues of development cooperation receive special attention. The media attentiveness is seen as dissatisfying.

Several experts pointed out that the Local Agenda 21 initiatives have lost importance. This is explained by the focus on international aspects/international distributive equity or the initiatives had a too holistic approach that was hard to transform into administrative action. Nevertheless the local level remains important and should get more attention for the implementation of SD policies.

Consumers could be educated about SD issues to a greater extent, e.g. by popularising a sustainable shopping basket, through local projects, or by developing a CO_2-label.

Mobilising Citizens

Even though German society is very socially engaged, with around 23 million people (36 percent of the population) involved in some sort of voluntary work (Bundesregierung 2008a: 121), very few citizens take part in initiatives dedicated to the implementation of SD. Despite experimenting with an open Internet consultation for the NSSD and the subsequent progress reports, the involvement of individual citizens remains weak. The Federal strategy takes little effort to concrete action in enabling citizen's participation.

But also, other venues and arenas for citizen involvement are insufficient. As described above, the Local Agenda 21 initiatives lost momentum. Shortly after Rio, many municipalities initiated such processes, but the number declined in the following years (Forum Umwelt und Entwicklung 2002: 9). A few cities, such as Erfurt or Nuremberg, have been successful in creating an enduring Local Agenda 21 process.

Other, more focused initiatives, such as the sustainable mobility concept developed by the town and people of Prien in Bavaria, or the large number of climate protection strategies, such as in Freiburg, show how civil society can contribute to sustainable development on the local level. In many other towns, photovoltaic power systems are operated by popular initiatives. The "Bürger Initiieren Nachhaltigkeit" (Citizens Initiate Sustainability) competition run by the German Government and the Council for Sustainable Development is currently focusing on "intragenerative dialogue" to strengthen social cohesion (RNE 2009). It aims to identify popular initiatives that can act as examples for others. A range of projects already exist, but most of them are on a small scale.

All of these initiatives reveal that there is wide support for the issue of SD. But as these examples are still the exception rather than the rule, there is an enormous untapped potential within the population that could be exploited. It will not be possible to achieve SD without the engagement of the people.

4. Strengths and Chances

How do these efforts relate to trends and policies in major issue areas with a high relevance for Sustainable Development? Chapter 4 provides an overview of selected but exemplary issue areas. We analyze the state of affairs regarding technologies, markets and policies in six key issue areas of SD policy: green technology, intelligent mobility logistics, carbon management, buildings and urbanisation, car industry and finance and investment. We highlight both strengths and chances within the respective domains. Despite some success in developing green technologies and markets in these areas, there are still underutilised potentials in these issue areas.

4.1. Green Technology Industry

Green technologies are inherently dispersed across all industrial sectors, including automobile manufacturing, construction and mechanical production. Therefore it is difficult to specify green technologies in statistical terms (Ernst & Young 2006; James 1997; Jänicke 2008; Jänicke and Zieschank 2008). However, recent studies based on the review of markets for selected technologies show that the green tech industry will soon outpace traditional industries in terms of numbers of employees and economic turnover (DTI and DEFRA 2006; Edenhofer and Stern 2009; Garrett 2009; Jackson 2009; McKinsey 2009a). According to a market study research conducted by the Ministry of the Environment, the German production of environmentally friendly goods valued 69.5 billion Euros in 2007 (BMU and UBA 2009). Today, green tech constitutes about 5 percent of German industrial production and is exhibiting an upward trend. According to the same source, from 2005 until 2007, the share of the green tech industry in industrial production grew by 27 percent. Green tech is perceived as a new leading industry, paving the way for a fundamental transformation of the industry (Jänicke and Jacob 2008). Most remarkable is the production of goods for energy generation from renewable sources, which has tripled since 2002. Within two years (2004-2006) the number of employees in the production of goods and services related to renewable energy doubled to 235,300 (BMU and UBA 2009).

In 2006 at least 1.8 million people were employed in jobs related to environmental protection. This is only about 4.5 percent of the overall German workforce (BMU and UBA 2009), but the number of jobs related to environmental protection is still rising. A study by Roland Berger Strategy Consultants (2007) estimates that the green tech industry will possibly employ more people than the German mechanical and automobile industry combined by 2020. Again, this trend is most remarkable in the field of climate protection and

the production of goods for renewable energy generation. Another recent study by McKinsey (2009b) shows that there is the potential to create 850,000 new jobs in Germany in sectors related to energy efficiency by 2020. Furthermore, a study by the Potsdam Institute for Climate Impact Research and the Fraunhofer Institute concluded that a cut in greenhouse gas (GHG) emissions by 40 percent by 2020 would result in the net creation of 500,000 additional jobs and save 20 billion Euros in energy costs per year (Jochem et al. 2008). A number of economists have shown that in Germany and the United States, investments in energy efficiency and renewable energy technology have a much greater effect on employment than investments in traditional fossil energy generation (Pollin et al. 2008). But Germany is not an isolated case. Other countries are catching up and developing strategies to explore the potential of green technologies. For example, the British government recently presented a strategy to boost green manufacturing and environmental innovations with the aim of doubling the exports of eco-efficient products and services by 2015 (Edenhofer and Stern 2009). Meanwhile, China is making efforts to close the gap with industrialised countries in the production of environmental products and services. Also, more than 80 percent of the Korean economic stimulus package is largely dedicated to green tech (BMU and UBA 2009; HSBC 2009). And last, but not least, the Obama administration has initiated a change of climate and environmental policies *inter alia* to participate or even to take the lead in this development. By 2020, the turnover of the global green tech industry could account for over 3100 bln Euros (Roland Berger Strategy Consultants 2007). So far, Germany is in an excellent position in these markets: The German share of global export of environmental friendly products is 16.1 percent. Germany's most serious competitors are the United States with 14.9 percent and Japan with 9.2 percent of overall environmentally friendly exports (BMU and UBA 2009). Germany's leading position in the world market is at least partly a result of an innovation-oriented strategy for sustainable development and environmental policy, which has been advocated by Germany from the beginning (Jänicke 2008).

The further growth of the German green technology market is endangered by several restrictions. First, the lack of capital and the falling prices of natural resources, which are a cause of the current financial and economic crisis, are unfavourable for green technologies (Edenhofer and Stern 2009). In the green tech sector, Germany boasts a great number of "hidden champions" among the SMEs. According to information from the expert interviews, a significant number of SMEs have difficulties obtaining credit, especially in the current economic situation. If they are not being identified and supported in time, there is a high risk that they will simply disappear and that jobs, as well as patents, will be lost with them. Moreover, a lack of qualified employees could possibly restrict the devel-

opment of the green tech industry in the future. Finally, unsustainable consumer preferences and behaviour restrict the markets for green tech.

Several measures have been put in place to overcome the barriers for further development of the green technology market. One such measure is the creation of a master plan for environmental technology, which is under preparation to coordinate better environmental and innovation policies. A program to reduce energy consumption of IT has been initiated and is part of the economic stimulus package. However, positive movement in the green tech market appears to stem from actions within the domain of the federal environmental ministry, while the ministry for economics and technology still resist the promotion of green tech industries, as it is often still considered an illegitimate market intervention (Jacob and Volkery 2005). The expert interviews noted several good practices of initiatives beyond the domain of the environment. Two example of such practice include the program "Research for Sustainability" (FONA) by the Ministry for Education and Research and the High-Tech Initiative of the federal government. The latter aims especially to develop and test innovative technology to improve the resource efficiency of raw materials and minerals. This goal focuses particularly on industrial production processes and high tech metal, in industries with large material need (for example, the metal, chemical, and building materials industries).

4.2. Intelligent Mobility Logistics

In spite of improvements in various sub-areas, particularly the reduction of air pollutants by technical measures, road traffic in Germany leads to a large number of environmental and health problems. It is still an important cause of air pollution, ground level ozone, noise, reduction in the quality of life, land consumption, and the fragmentation of ecosystems (SRU 2005a: 35). Between 1990 and 2006, the German transport sector's GHG emissions decreased by 1 percent (EEA 2009: 17). Although this is a respectable result in comparison to almost all other EU member states (in most places, GHG emissions from the transport sector increased (EEA 2009: 17)), it is in not sufficient to meet CO_2 goals.

The NSSD 2002 mentioned seven fields of action relevant for sustainable mobility: Avoiding traffic, shifting traffic, capital spending for traffic hubs and interfaces, integrating transport systems, reducing environmental impacts, increasing transport safety, giving grants for research and innovative technologies, and strengthening transport policy on the European and international level. With regard to the mobility-related indicators of the NSDS, the current trends in freight transport intensity and inland water transport of freight are going in the wrong direction. Although the current development of passenger transport intensity and share of the railway sector to freight lifted are pointing in the right

direction, they will fall short of the aims for 2010/2020 and 2015 by more than 20 percent, if the current development continues. According to one of the expert interviews, even SD actors within the Federal Government consider the mobility-related aims of the NSSD no longer attainable. Experts expressed different positions about whether the question if this situation was rather motivating (persistent incentive for intensified efforts) or rather frustrating (feeling that all efforts are in vain).

Today, German passenger transportation is dominated by individual car traffic, which accounts for 80 percent, in comparison to around 5 percent for air traffic, 7 percent for the railway sector, and 14 percent for public road traffic (BMVBS 2008a). An especially high increase is predicted for freight transport in the future: It is expected at least to double by 2050. Exceptionally dynamic growth is predicted for the transit transport sector. However, the present division of mobility types will scarcely change (BMVBS 2007).

Nevertheless, current German transport policy approaches offer strengths and strong points on which advanced SD policies could be built. An important concept is the 2008 release "Freight Transport and Logistics Masterplan" (Bundesregierung 2008c), which outlines an integral approach towards economic efficiency, environmental friendliness and social responsibility. The foundation of a "Transport Infrastructure Financing Company" and the heavy goods vehicle tolling system are further potential starting points for SD policies.

In regards to the main transport in Germany, freight transport will increase especially within port-hinterland connections and between conurbations (Bundesregierung 2008c: 34, 42). Therefore it is crucial to find solutions for main transport axes and arteries. Here, the government's freight transport and logistics master plan provides a good starting point for designing intelligent transportation ways. The master plan aims to significantly extend important transportation arteries and connect them, while taking noise mitigation, environmental protection, nature conservation, as well as the interests of agriculture and forestry, into consideration. In order to enhance the efficiency of the main transport arteries, a greater separation of slower freight traffic and faster passenger traffic is envisaged in the master plan (Bundesregierung 2008c: 54f).

Considering the increased land-use development in Germany, this approach of upgrading main traffic arteries is a starting point for enhancing sustainability of German transportation. It will be important to complement the master plans approach by both decreasing construction on other roads and motorways as well as "greening" the arteries according to the Commission's Freight Transport Logistics Action Plan and the concept of "green" corridors therein (COM 2007c: 11).

Concentrating traffic on and around main arteries contributes to a significant decrease in noise and an enhancement in the quality of life away from these arteries. In consideration of the strategies goal to decrease land consumption down to 30 hectares and thus prevent an increasing fragmentation of ecosystems, the concentration of main arteries presents a good approach for the future. Transport corridors could be made "green" by complementing short sea shipping, rail, inland waterways and roads with each other to enable the choice of environmentally friendly transport using intermodal/multi-modality infrastructure in terms of transhipment facilities at strategic locations (i.e., seaports, inland ports, marshalling yards), which efficiently integrate the potential of the different modes of transport (COM 2007c: 11). Germany could therefore aim to become a leader of "intermodal infrastructure and technology".

Public Private Partnership (PPP)-solutions have the potential to be an effective approach in the user-financed, efficient delivery of motorway widening and maintenance, provided that they are designed in a transparent and efficient way, that they are prepared, tendered and monitored by credible public institutions and that contracts are well elaborated and risks allocated in an adequate way; PPP is becoming a tool of transportation financing. With the founding of the Transport Infrastructure Financing Company in 2003, the introduction of the heavy goods vehicle tolling system in 2005, and the first PPP-motorway-projects, the initial prerequisites have been met to implement a solution akin to the concept developed by the so-called “Pällmann-Commission” (KV 2000).

One of the key recommendations of the commission’s report is that the user pay principle should be applied in a way that accounts for the demands of transport, structural, environmental and economic policies. It furthers states that the German federation should retain the responsibility of infrastructure development. According to the report, for the concrete implementation of the recommendations regarding motorways, not only heavy goods vehicles, but also passenger cars, buses, small trucks and motorcycles should be incorporated into the tolling system. The report suggests that charges should be differentiated by type of vehicle, routes/traffic burden and time. The petroleum tax should decrease incrementally.

These measures contribute to a more efficient use of infrastructure both on the supply and demand side. In addition, infrastructure funding would become demand driven and therefore independent of public budgets. Vehicles from abroad would contribute to a larger extent to the infrastructure costs in Germany. One of the interviewed experts mentioned that PPP-solutions are largely motivated by financial policies and that aspects of sustainable development have an inferior relevance. The main goal of PPP-projects is to conserve the federal budget.

The master plan and the recommendations of the "Pällmann-Commission" support a reduction in congestion in order to reduce CO_2 emissions. However, reduced congestion could lead to an increase in transport. By means of a skilful design and a combination of these measures, rebound effects will most likely be avoided.

4.3. Carbon Management

Successful carbon management will be one of the main tasks for political leaders in the 21st century. The reduction of CO_2 emissions must be pursued decisively in order to keep global temperatures from rising more than 2°C (IPCC 2007; Anderson and Bows 2008; Hansen et al. 2008). To achieve this, two strategies are crucial: First, energy efficiency must be raised immensely, and second, energy production must switch to renewable energies on a large scale (Hennicke and Fischedick 2007: 91). Practically all scenarios that assess a sustainable restructuring of the energy sector conclude that an efficiency revolution is the indispensable starting point from which to embark (Hennicke and Müller 2005: 214; Hennicke and Fischedick 2007: 91ff). The potentials in this field are enormous (Weizsäcker et al. 1995; Laumanns 2005). In addition, carbon sinks might have to be activated through global reforestation (in combination with reduced deforestation), and possibly the capturing and storing of carbon (CCS) (Canadell/Raupach 2008; Streck et al. 2008; RNE 2004).

Germany has improved its energy productivity by 40.1 percent between 1990 and 2007. While some sectors saw significant advances, others were less successful. Overall, Germany will have to double its efforts in order to achieve its goal proclaimed in the sustainability strategy, increasing energy productivity annually by 2.8 percent per year by 2020, compared to only 1.4 percent since 1990. It will need significant political efforts in order to achieve this. The performance of two of the relevant sectors is dealt with in the sections on buildings and urbanisation, as well as in the section on the car industry.

Electronic appliances have seen remarkable improvements in efficiency, but unfortunately they have been translated insufficiently into widespread usage. Instruments like a top runner programme, which has been implemented very successfully in Japan, provide a good option for improving widespread use (METI and ECCJ 2008). Similarly, this could be achieved by the EU Directive on Eco-Design of Energy-using Products.

Germany's renewable energy policy is considered to be highly successful in the electricity sector (Büsgen and Dürrschmidt 2009; Klein et al. 2006) and the instrument of feed-in tariffs has spread to about 50 countries worldwide (Bechberger and Reiche 2007; Büsgen and Dürrschmidt 2009). The renewable-energy law (Erneuerbare-Energien-Gesetz - EEG) has helped Germany boost renewable resource electricity production to 14.8 percent in

2008, compared to just 6.3 percent in 2000. In 2008, the renewable energy sector produced about 30 billion Euros in total revenue (BMU 2007a: 12). The renewable energy branch employed 278,000 people, which is an increase of 73 percent since 2004 (BMU and UBA 2009: 93). Thereby, the EEG did not only help to reduce 44 million tonnes of greenhouse gases in 2006 alone (BMU 2007a: 12), but also created many much-needed green jobs. Expectations are high that this success can be repeated with renewable heating as well. It has yet to be shown whether the newly introduced renewable energy heating law (Erneuerbare-Energien-Wärmegesetz - EEWÄrmeG) will be enough to achieve the targeted share of 14 percent renewable heating by 2020. Its two pillars, the necessity to include renewable heating in newly built homes and the market incentive programme (Marktanreizprogramm - MAP), are at least theoretically sufficient.

The Ministry of Economics invests in energy-related research for multiple energy sources, including the areas of carbon capture and sequestration, cogeneration of heat and power, fuel cell development, and more efficient use of energy in construction, industry, retail and services. The 'export initiative' for renewable energies uses the international clean development and joint implementation mechanisms, as well as other multipliers, as avenues to foster both the international deployment of clean, renewable energies, as well to reach the envisioned goal to reach an export quota of 70-80 percent in this industry.

Germany's opportunities to increase its domestic forest area are very limited; hence focusing on international deliberations towards an effective regulatory framework for protecting and recovering the world's ancient forests appears suitable.

Regarding CCS, there has been much debate about its capabilities as well as its risks. While some argue that the technology is in principle useful and arguably necessary, others point out it should be kept in mind that many pressing issues still need to be addressed (Gilfillan et al. 2009; Freese et al. 2008; IPCC 2005). For example, widespread deployment of CCS will not be available before 2020. In addition, important questions regarding the geological stability of potential storage sites still need to be addressed. In general, the overall efficiency of a plant decreases overtime; by 2020, it is likely that many new coal-fired power plants will already have been built and running for decades before CCS can be deployed on a larger scale (BUND 2009).

The German debate focuses on carbon pricing, technologies and the increase of renewable energy while still keeping up the phasing out of nuclear energy. There is no significant conceptualisation of carbon management. Not even within climate and energy research programs is there much consideration of carbon recycling as a long-term perspective.

4.4. Buildings and Urbanisation

Buildings and urbanisation and related energy usage are an important issue area for Germany. It is an especially relevant topic in Germany because 49 percent of the population lives in urban areas and a further 36 percent lives in semi-urban areas (figures acquired from Statistisches Bundesamt). A recent study by McKinsey estimates the carbon abatement potential of the buildings and transport sectors as follows:

- Buildings: Potential to save 20 percent of carbon emissions by 2020 compared to today's level; almost 90 percent of this potential will have positive pay-offs for investors (McKinsey 2008: 37f)
- Transport: Potential to save 11percent of carbon emissions by 2020 compared to today's level; around 40 percent of this potential will have positive pay-offs for investors (McKinsey 2008: 40f)

Reducing carbon emissions yields economic benefits and leads to lower energy and resource intensity. Nevertheless, if Germany continues at its present pace it will fail to meet its target of reducing carbon emissions by 60-80 percent by 2050.

Germany currently has a number of initiatives in place. The 2007 German Energy Saving Ordinance (EnEV), which is the implementation of European Directive 2002/91/EC on the Energy Performance of Buildings, introduced the Energy Performance Certificate ("Energieausweis") (Bundesregierung 2007). This certificate has been obligatory since 2008. The focus of the legislation is exclusively on energy rather than any other aspects of SD.

The German government has invested significant sums into retrofitting old buildings in recent years through its building renovation programme ("CO_2-Gebäudesanierungsprogramm") (BMVBS 2009: 7). Furthermore, the Ministry of Economics and Technology has initiated a research program on "innovation and energy technologies" with one focal point being "buildings of the future" (BMWi 2009: 5). This program supports the development of new buildings that halve the current primary energy consumption and thus contribute to growth, jobs, and competitiveness in Germany. In the framework of the recent economic stimulus packages, the federal government itself is fostering demand for energy-efficient construction through the energetic rehabilitation of schools, kindergartens, and sports facilities.

In addition, there are a number of private-sector initiatives that focus on the retrofitting of existing buildings and large housing estates. For example, the retrofitting of the "Märkisches Viertel" housing estate in Berlin revealed the large economic potentials: Investing

in retrofitting was seen as desirable as it could eventually lead to improved living standards and hence higher rents (GESOBAU 2008). More of these sorts of standards and certificates would increase motivation and would be welcomed by the players involved.

A number of countries have schemes in place to assess the overall SD performance of buildings. The most prominent of these are the BREEAM (Building Research Establishment Environmental Assessment Method) scheme, which originated in the UK and is now the world's most widely used environmental assessment method for buildings, and the LEED (Leadership in Energy and Environmental Design) scheme developed by the US Green Building Council (USGBC) (Braune et al. 2007: 7f). Unlike the German Energy Saving Ordinance (EnEV), most of these schemes rely on voluntary participation.

The German Sustainable Building Council (Deutsche Gesellschaft für Nachhaltiges Bauen, DGNB) has recently introduced a voluntary scheme known as the German Sustainable Building Certificate ("Gütesiegel für nachhaltiges Bauen"). Taking the entire lifecycle of a building into account, the Certificate assesses the impact of SD on buildings from the planning and construction stage right up to demolition. It aims to act as an incentive for decision-makers to consider SD early on in the planning and construction stages (Deutsche Gesellschaft für nachhaltiges Bauen 2009).

Increased efforts can be observed on the part of the German government too. The Ministry for Transport, Construction and Urban Development's "2008 Urban Development Strategy" only briefly deals with low-carbon issues (BMVBS 2008b). However, in the wake of the economic crisis and the resulting increase in government spending, new emphasis has been put on low-carbon projects and strategies. Thus the February 2009 Sustainability Report issued by the Ministry sets out more ambitious measures especially with regard to transport and building modernisation. The strategy also stresses R&D activities, lighthouse projects and the dissemination of information on low-carbon development (BMVBS 2009).

Many obstacles to low-carbon urbanisation remain in Germany. They include economic barriers, regulatory hurdles and a lack of consumer awareness. Carbon-saving potential exists almost everywhere, for consumers and producers, real-estate owners and vehicle owners. This potential is not being sufficiently exploited at present. A number of reasons for this can be identified:

- Transaction costs: Implementing carbon-efficiency measures involves considerable additional costs related to the identification of problems and application of possible solutions. Information deficits mean that there is uncertainty about the economic impact of low-carbon measures. This uncertainty is an obstacle for risk-averse actors.

These costs are not taken into account by McKinsey (2008) in their calculation of pay-offs for investors (see above).

- Lack of capital: Capital provision for manufacturers of new technologies and products is often precarious since the credit risks are difficult to assess. Typically, high initial investments are needed and payback periods are long, usually exceeding 10 years. The interviewed experts highlighted that the current financial crisis provides an opportunity for governments to overcome the notorious shortage especially of venture capital in low-carbon business.

- Fragmented value chains: Many different actors are involved in the value chain, often making it impossible for consumers to identify which company has reacted to SD concerns and which has not. Without proper pricing signals, there are no incentives for manufacturers to increase the carbon efficiency of their products. Closer cooperation between different actors in the value chain could lead to increased carbon abatement. However, current tender regulation often prevents such cooperation (Fraunhofer-Institut für System- und Innovationsforschung et al. 2007).

- Path dependencies and market power: Path dependencies and market power prevent radical, systemic innovations and only permit gradual, incremental change on the path towards a low-carbon society. Path dependency stabilises the grid-bound transport sector as the choice of technology influences the infrastructure and vice versa (KV 2000: 23).

- The expert interviews revealed that several financial cuts by the federal government have major negative impacts on low-carbon development, such as the cuts in federal funding for public transport.

- Unevenly distributed costs: The uneven distribution of costs and benefits between landlords and tenants often presents a barrier to speeding up low-carbon urban development (Knopf et al. 2008).

The German government does not yet enforce low-carbon building and city planning as a binding instrument. Building codes could certainly be stricter. Recently brought into discussions are concepts for cities to adopt regulations requiring that all buildings meet certain low-carbon standards when they have a change of tenant, are sold or renovated. As commercial buildings appear to be a very receptive branch, retrofitting policies should build on this opportunity. Energy contracting models – a third party bears the modernisation costs and in return receives a share of the saved energy costs – are being imple-

mented by forerunners, but are by no means mainstreamed yet (Knopf et al. 2008). The same is true with energy audits and energy information, which are effectively reducing the cost of information for decision-makers.

4.5. Car Industry

The traditional automotive industry is internationally in a severe crisis; both because of overproduction and misleading product patterns. Most experts are convinced that there is a need for eco-innovations and restructuring in order to address the challenges of the economic crisis, the mass motorization of developing countries, and the volatility in oil prices (Bekker 2008; SRU 2005b; Schmidt 2007). As a response to the crisis, two developments may occur: Car manufactures may start to target the immense market in developing and newly industrialized countries with small, mileage-efficient and inexpensive cars, as well as develop green premium cars (BMU 2007b; T&E 2008; VDA 2008, Henzelmann et al. 2007; Weider 2007; Hayek 2008). Although the price of oil is currently at a long-time low, prices are likely to bounce back strongly after the economy recovers (Austin 2009). This will spur the demand for fuel-efficient cars.

The automotive industry is an important pillar of the German economy. According to the German Federal Ministry of Economics and Technology, German-made cars were Germany's largest export in 2007, earning approximately 184 billion Euros and thus making Germany also the world's largest car exporter (BMWI 2008a: 13). Several large car manufacturers are based and have plants in Germany. In addition to car manufacturers, there are a great number of German automotive supply companies, such as Bosch, Continental and ZF Friedrichshafen. Furthermore, depending on the source, the number of jobs related to the car industry in Germany varies from around 2 million to 5.3 million jobs (Endres 2009). In the future, the German automobile industry may decrease in importance due to the challenges the industry faces from overproduction and decreasing automobile prices. However, the current crisis reveals an opportunity: Demand is not rising for faster and more comfortable cars. Instead, smart solutions including new services for mobility are needed.

There are many different innovative designs for "green cars," such as efficient diesel cars (so called "three-litre-cars"), electric cars, hybrid cars, hydrogen cars, fuel cells and biodiesel (Henzelmann et al. 2007; Rudolph 2003). This variation in innovative designs might even increase in the future. It is an open question which design will be successful in the mid- and long-term. What is clear is that the German car industry needs to make a change from its existing technological designs (Henzelmann et al. 2007).

Traditionally, German carmakers tend to build heavier, increasingly powerful cars, which are comfort and safety oriented, but also emit more CO_2 than the European average (T&E 2008). This has a significant effect on the environment, since 20 percent of Germany's CO_2 emissions come from the transport sector (BMU 2009e). In order to address these concerns, German auto industries have mainly developed new efficiency programs, concentrated on improving diesel engines, and are now beginning to invest more in the research and development of alternative technologies (T&E 2008). The resources spent on R&D in the German car industry are tremendous: In 2007, German carmakers invested 18 billion Euros and employed 91,000 people in R&D (VDA 2008: 269).

The main obstacles to developing green cars have been consumer preferences, the lack of a speed limit on highways, and the preponderance of voluntary agreements instead of a stable regulatory framework within both German federal and European legislation (SRU 2005b). The environment has not been a significant concern for many consumers when buying a car (Henzelmann et al. 2007: 55); however, there are indications that this is changing: In a recent representative survey on environmental attitudes, a promotion of energy efficient products found high rates of approval (BMU 2008c: 18). The lack of a speed limit on German highways has an indirect impact on the environmental performance of German cars because it contributes to the trend of heavy and powerful cars instead of light and efficient ones (SRU 2005b). The same survey found that a majority of Germans are in favour of a speed limit of 130 km/h (BMU 2008c: 19). Finally, the tendency to rely on voluntary agreements to reduce harmful car emissions, instead of regulatory and market based instruments, has been repeatedly shown not to spur technological innovation in the car industry (Sprenger et al. 1999: 221; Weider 2007). However, with the new CO_2 regulation for passenger car fleets issued by the European Commission, there are considerable incentives for the German car industry to change their product portfolio (T&E 2008: 7; EurActiv 2008).

Additionally, Germany adopted in 2004 a fuel strategy that aims to reduce the fossil fuel content of gasoline by increasing—in line with the EU's bio fuel directive—the share of bio-based fuel added, generated mainly from crops, sugar beets, rape and sunflowers, to 5.75 percent by 2010 and to 8 percent in 2020. Public controversy has arisen over the fact that agrofuels will have to be imported in order to achieve these goals. Next to agrofuels, the German fuel strategy has taken steps to increase the market shares of natural gas to 2 percent in 2010 and 10 percent in 2020; the fuel strategy for hydrogen is for a 2 percent market share in 2010 and 5 percent in 2020 (BMU 2007b: 20-21). The fuel strategy was negotiated between the relevant departments, scientists and actors from business and society within the framework of the NSSD. Despite these efforts, there are no additional

foreseeable measures, such as congestion charges, increases in fuel taxes or emission charges that would provide further—and possibly even stronger—incentives for innovations.

4.6. Finance and Investment

The providers of financial services have large potentials to induce changes in company management, consumer behaviour and reframe markets and regulations in line with SD. Their business involves nearly all companies, institutional and private investors as well as consumers. Therefore, integrating carbon emission factors into their services would have a large impact on society and business as a whole. By offering appropriate financial products, the financial industry could stimulate private investment in a low-carbon economy, particularly with regard to renewable energy and clean technologies.

By mid-2008, there were over 170 sustainable funds available in Germany, representing investments of more than 25 billion Euros. Of that, about 6 billion Euros were invested in companies dealing with renewable energy. The potential for investment in the sector is huge: To reach the EU goal of making renewable energy 20 percent of total energy consumption in the 27 Member States of the EU, an investment of 1.8 to 7.3 trillion Euros (depending on the type of renewable technology) is required over the next decade. It is estimated that the global market volume for renewable energy power plants will reach 275 billion Euros in 2020. As a global leader in this sector, the German renewable energy industry will benefit enormously. Studies indicate that German companies will account for 13 percent of the worldwide market (worth some 35 billion Euros) in 2020, offering investors manifold sustainable investment opportunities.

The providers of financial services can supply capital to small and emerging sustainable businesses and industries. They can also shape the conditions for loans. This would act as a major driver for carbon-sensitive economic activity. To date, private financial service providers have not engaged with this market segment to any significant extent. One proposed solution is to integrate carbon-related (and non-financial) criteria into risk analyses on a mandatory basis. Present efforts in this direction are voluntary, such as the Equator Principles, a set of 15 criteria applying ecological and social factors to all investments over 50 million Euros. Only two banks in Germany are currently signed up with Principles.

Financial service providers and policy-makers have recognised the winds of change. They are aware of the fact that carbon emissions must be factored into the development of financial products. As an example of the joint efforts under way, the German Environment Ministry has launched Climate Change Awareness Week, involving nearly all of the major

banks, insurance companies and other financial service providers in Germany. Its main objective is to raise public awareness and help financial service providers realise the full potential of climate-friendly financial products.

It would also be possible to establish a Basel III agreement obligating financial service providers to incorporate environmental, social and governance (ESG) factors into their risk analysis. Such procedures would provide a two-fold benefit. First, they would foster the development of new carbon-sensitive financial products supporting sustainable industries and companies. Second, financial service providers would benefit as their own business risks related to climate change, related policy measures and negative publicity would be reduced. A compulsory framework would also encourage ESG factors and carbon sensitivity to become the default standard for the financial sector.

5. Bottlenecks

In the final chapter, the anchoring of SD in policy making, business and society is analysed in regard to their potential to further exploit Germany's strengths in transforming to a low-carbon society and building a more sustainable future. We analyse, how SD can be better integrated in politics, how participation for SD can be improved, discuss opportunities to integrate SD in education (in particular in vocational training) and ask how business could provide 'smart solutions' as well as how international cooperation can contribute to this.

Our analysis is largely based on the views of the interviewees complemented with policy documents and academic literature on the different issue areas.

5.1. SD Politics

Political Will and Leadership

To effectively mainstream SD into German policy and into other various issue areas, a high level commitment and support by politicians is necessary. But, to date, the issue of SD has not been recognized as a priority among several ministries and most German politicians thus far. Chancellor Angela Merkel and the head of the Chancellery Minister Thomas de Maiziere frequently refer to SD as a guiding principle. This is perceived by many experts as an endorsement, reflecting the position of the administration and actors in civil society. However, many observers reveal that SD is not yet in the mainstream. Rather, most German policies lead in an unsustainable direction.

So far, there is no legally binding commitment of German politicians to the principle of SD. For example, the enactment of a law on intergenerational justice has been discussed in a hearing of the Parliamentary Advisory Council, but consensus could not be reached (http://www.bundestag.de/bundestag/ausschuesse/gremien/beirat_nachhaltigkeit/anhoerungen/33_sitz/index.html). Moreover, experts and policy analysis indicate that Germany's policies lack coherence. German politicians are free to pursue unsustainable, short-sighted policies, while at the same time initiating SD-related projects and policies. As a result, those SD policies that do exist are varying and diverse, spread across different ministries and issues. Many interviewees noted that large policy domains were not addressed at all or are kept away from the SD agenda. SD has not been established as a guiding principle of day-to-day politics. SD institutions were perceived as rather marginal and just one option among many with little impact on policy development. According to interviewees, aspects of sustainability were more effectively imple-

mented through the regular coordination between departments within the normal process of political decision-making.

Interviews revealed that while some ministries develop SD-related programs and projects for their own ministries, SD has so far failed to reach the level of overarching government strategy. For example, the Minister for Economic Cooperation and Development presents herself in public as being fully committed to SD, using the issue in negotiations with other departments and with European and international organisations. The Ministry for Education and Research has devoted considerable funding to SD-related research. However, despite of the highly visible research program, there are still major areas of research policies that appear untouched from SD issues. For example, as interviewees noted, the German Excellence Initiative of the German Research Foundation (Deutsche Forschungsgemeinschaft) has yet to fund any clusters of "excellence" that focus on sustainable development questions. The Ministry for Consumer Protection and Agriculture was first ministry to develop a comprehensive SD action plan; the majority of units within the department are involved in this effort. The Ministry for the Environment is widely perceived as a strong advocate of the SD strategy on the administrative working level, although some observers note weak backing by political leadership.

The above noted examples remain the exceptions of SD integration into policy. In other ministries, the political level is only involved with specific projects and programs, while the main agendas appear untouched. Overall, interviewees stressed that especially when addressing high-profile issues that are important for the departments and their political leaders, there is a lack of incentives to bring SD issues into the inter-ministerial coordination processes. It is feared that the issue may be watered down or that the merits are claimed outside the department. Furthermore it was noted that SD is not being used to reform the departments or to argue in negotiations. In particular the Ministry for Economics and Technology is perceived as hindering rather than promoting SD issues. As a result of such hesitant adoption of SD and the small degree of commitment to it, political agendas have remained unchanged and core policies have remained untouched. It is reported that SD policies rise and decline in importance on the political agenda with the change of ministers, underscoring the need for stable institutionalisation.

The interviews revealed a perception that the SD strategy and its institutions remain in the periphery of government actions. It seems, however, that this is slowly changing: The ministries are increasingly seeing SD as a point of reference for their own activities. Several interviewees attested to a growing—albeit partial and slow—interest in sustainability and its role in policy development.

Within the German Bundestag, the Parliamentary Advisory Council on Sustainable Development has been successful in introducing the issue. However, the Council was not established on an equal footing with standing committees and, therefore, lacks administrative capacity. Several interviewees described the Council as potentially relevant and powerful, although currently it holds relatively little influence. A limiting factor for the effectiveness and visibility of the parliamentary council was the lack of time parliamentarians could commit to the issue, as well as a more general lack of administrative support.

As outlined by expert interviews, SD still is not considered a priority issue for political parties in Parliament. The Council in general is perceived as positive and supportive by the governmental administrations. However, the parliament as a whole appears ambivalent towards SD issues. It has been noted that during the legislative process, proposals are changed substantially, often at the expense of SD issues. To correct this weakness in the legislative process, the Advisory Council has been promoting the idea of a Sustainability Impact Assessment for legislation and is willing to take an active role in this.

Several interviewed experts remain sceptical about the idea of impact assessments, fearing that they will be performed in too formal a way and, as a result, overly burden administrative capacities, thereby running the risk of a slowing down the legislative process.

Resources and Implementation

The National Strategy and the Progress Report (Fortschrittsbericht) entail only a few tangible measures for implementation. A coherent action plan to achieve the goals has not been developed and no budget has been allocated for projects or measures. The development of concrete actions rests largely within the domain of the departments. Additionally, there is no coherent picture on implementation efforts. In 2008, reports on the ministries' activities were initiated to inform the State Secretary Committee (Staatssekretärsausschuss für nachhaltige Entwicklung). These reports are currently under way. As outlined above, the Ministry for Consumer Protection and Agriculture was the first to prepare and publish an action plan involving concrete measures. Nevertheless, this remains the exception: Other departments take responsibility for specific projects or issues, but in the majority of policies, the related units and budgets are largely untouched by SD policies.

There are examples of further extending the strategy to units and issues that have been unrelated so far. For example, it was mentioned in the interviews that the RNE's proposal to focus the German contribution to the 2010 World Expo in Shanghai on SD issues has led to an intensive discussion within the responsible unit in the Ministry of Economics. There is a common view that SD issues "trickle down" into the different domains of policy making. However, according to many observers, core policies remain unchanged. SD

related policies are of growing importance, but large domains are still unrelated to the strategy.

Relation to other Priorities and Programs

Many interviewees perceive the SD strategy merely as one among many, and certainly not as the most important strategy in German policy making. Although some specific goals have gained importance, there is a widespread view that SD so far has not been established as a guiding principle in core decision-making: Other strategies, programs, policies coexist without being related to the SD process. One example is the reform programme of the labour market, the so-called Agenda 2010, which makes references neither to the SD strategy process nor to the issue of SD in general (Wurzel 2008, SRU 2008). Nevertheless, interviewees pointed out that it was still possible to integrate selected SD concerns into other strategies. Although only a few elements of the economic stimulus package (Konjunkturpaket I und II) support SD goals the package, particularly politicians perceive it as an example in which SD concerns have been taken into consideration. Even climate policies are not dealt with in the framework of the SD process, even though the related policies are central to the strategy. Some observers perceive the High Tech strategy as an example where SD issues have been considered. However, this observation is disputed, since the development of the strategy was not at all linked to SD institutions.

Overall, the SD arena is politicised only to a small degree and major issues of German politics are excluded from this arena. There are few issues of high politics discussed in the framework of the strategy and the institutional framework. The concept of SD is spread by the actors involved, but the process is perceived as too marginal to become important if it comes to allocation of resources or changing existing policies. Rather, the SD process is seen as an option for additional legitimisation of policies that would have been undertaken in any case. The impact on both existing policies as well as planned policies is perceived as being too weak for an achievement of the goals of the strategy.

Priorities of SD Policies

Despite wide consensus throughout the interviewees on the need to gear policies towards the principles of sustainable development and the acceptance of a cross-sectoral integration in decision making, large domains of policy making remain unchanged or even untouched. The concept of SD, and in particular the conceptualisation in Germany as a multidimensional, all encompassing strategy allows the actors involved to choose from a wide range of options according to their preferences and priorities. Although some experts characterised the strategy as somewhat biased in favour of the environmental dimension, the other domains are well represented with their respective agendas and priorities. For example, the Federal Ministry for Economics and Technology maintains the

need for economic freedom and the Ministry for Finance emphasizes the actual budgetary restrictions and regulatory guidelines. The departments vary considerably in terms of their commitment and ownership. Some ministries have not actively linked to the strategy. Representatives from the *Länder* are carefully protecting their constitutional rights and do not accept any engagement from the federal level within their domains of responsibility. Accordingly, interviewees noted that issues such as education were declared to be non-issues for national SD policies.

This overall consensus regarding the need for sustainable development is reflected in the political style and the discussions of the political institutions: The committees of the government, the Federal-*Länder* committee, and the Parliamentary Council of the Bundestag maintain a problem-solving style of debate, which is less dominated by institutional delineation compared to other inter-institutional processes and the political discourse in Germany. This does not mean that the SD discourse is free of conflict: There are frequent disputes regarding priorities, wording and implementation. In spite of this, political style was characterised in the interviews as being largely constructive and problem-solving oriented.

5.2. Participation

Public Sector

Sustainable development cannot be achieved by governmental policies only. It requires contributions from non-state actors—be it business, trade unions, civil society organisations or individual citizens. This holds true for both the development of the strategy, as well as for concrete action for implementation. The German strategy acknowledges the need for action of non-state actors by explicitly including issue areas and setting goals that cannot be achieved without contributions from civil society. The strategy and the subsequent Progress Reports have been widely distributed and actors have been invited to express their opinions. Although the strategy has not been negotiated with public actors, their opinions have been taken into account.

Although there was an open invitation to comment on the strategy and the progress reports, the consultation was largely limited to professional associations and institutions (Statz 2009: 86; Volkery 2004: 8). The strategy and the implementation process do not target non-professional citizens. Citizens are often perceived either as barriers for more advanced measures or as objects to be addressed by means of campaigning, educating and raising awareness. Some view citizens as a resource for knowledge and capacities to be included in SD policies. As previously noted, SD policies are not systematically linked to *Länder* or municipalities.

The Council for Sustainable Development (RNE) is seen as playing a central role in intermediation between civil society and the government (Bundesregierung 2002, 2008). Although the members of the Council are appointed *ad personam*, they represent certain facets or groups of public life in Germany. Furthermore, the efforts of the RNE to promote SD with the public are widely recognised and respected (Volkery 2004; Niestroy 2005; SRU 2008: 43). However, as expert interviews indicate, the outreach, although growing, is perceived as still being limited to a narrow SD community.

Expert interviews show that organisations of civil society remain relatively untouched by the SD-process. Although there are some examples of organisations that have dedicated considerable efforts to SD, this appears to be the exception rather than the rule. Furthermore, among the general public, the concept of SD and the efforts in the framework of the SD strategy are hardly known.

SD policies in Germany are hardly ever a topic of high politics or a factor in core decision-making. Decision making on legislation, budget and key governmental strategies are being kept in the traditional venues and modes of interaction and negotiations within the government (Tils 2007: 169; Volkery 2004). With this background, observers expressed in expert interviews that they are concerned about the lack of incentives for non-state actors to participate in the SD process. If important decisions are being made in other venues and institutions, the opportunity costs of becoming involved in the SD process are perceived as too high. This conclusion reveals the need to make the strategy more relevant in decision-making. If this is achieved, non-state actors will become engaged.

Others perceive the strategy as (necessarily) too holistic to become a subject of societal debate among more specialised interest groups. Participation of civil society has to be ensured when concrete action is taken and specific policies are formulated. From this perspective, the practice of participation has to change within governmental practices. But from an SD perspective, legislation should not be prepared only with the involvement of the immediately effected interest groups, but with a broader range of actors (Zwirner and Berger 2008; Meadowcroft 2004; OECD-DAC 2001; UNDESA 2001). There is some indication of change in this direction, though. The range of actors addressed in the preparation of legislation is broadened already in some departments. For example, in programming of research policies, actors from civil society are being consulted. The Ministry for the Environment invites associations for consumer protection. The same holds for the Ministry for Consumer Protection and Agriculture, which goes beyond the farmers associations and more towards a broader and balanced consultation. However, this is still far from being a common practice of governance in Germany. The major challenges and opportunities for SD include:

- The potentials to organise stakeholder participation in decision-making are not being fully utilised in Germany (Zwirner and Berger 2008). Within the SD process, the participation of stakeholders is rather limited. What is needed is a clear vision on the role of the different actors. Effective participation that goes beyond a sheer dissemination of information requires transparency, motivation and capacities both on behalf of the government as well as by non-state actors.

- Innovative forms of participation by citizens, such as focus groups, are called for. Increased citizen participation on the local level could overcome the current deficits.

- Participation should not be limited to SD policies in the narrow sense. A more open and transparent style of policy-making is required in all areas of decision-making. Guidelines and standards for participation could spread good practice. The planned reform of Impact assessment procedures could set standards for transparency in rule making.

While there are many experts that call for an improvement and extension of participatory approaches in policy making, several interviewees pointed out that there is already taking place a change in the culture of policy making. Several departments reported on experiments with stakeholder participation.

Private Sector

A recent survey by the German environmental organisation *future* finds that major German companies tend to use different types of dialogue forums for stakeholder participation, most often round tables (Clausen and Loew 2009: 74). These forums frequently discuss environmental and sustainability management issues. However, they do not deal with matters concerning their core business. Stakeholders are not yet seen as crucial for decision-making and their involvement tends to be short term. The result is ad hoc measures and marginal changes (Charter and Clark 2007: 23). Moreover, such participation often occurs after decisions have already been made.

Research shows that integrating environmental officers into product development departments can be a fruitful approach (Hoffman et al 2006: 97). Another possibility is the strategic implementation of CSR into top management. However, both approaches rarely occur in practice (Charter and Clark 2007: 4). Organisational barriers and the lack of stakeholder participation mean that the business opportunities offered by a low-carbon economy and SD are not being realised.

Business associations use a variety of methods to encourage stakeholder participation. The German Global Compact Network promotes and hosts multi-stakeholder forums. Other associations such as B.A.U.M. offer workshops on stakeholder relations and participation. *econsense*, in contrast, appears to be more one-sided, with companies presenting their achievements in reports, reviews and so on (econsense 2009).

Although the majority of German business is invisible for the end consumer, innovative approaches such as stakeholder circles can help to change the visual angle on market demands. One example is the UK Consumer Forum jointly hosted by the National Consumer Council (NCC) and the Sustainable Development Commission (SDC). This forum brought together a large panel of people selected to reflect the demographic make-up of a particular local area. The panel examined different areas of consumption and aspirations from the perspective of climate change and limited resources. The results revealed tensions between the material aspirations and concerns of ordinary people and the potential environmental impact. But they also showed that consumers are willing to change. The overall process demonstrated that consumers could help make core business practices more sustainable (Opinion Leader Report 2006).

To link the usually disjointed issues of CSR and sustainable consumption and production in Germany, the Council for Sustainable Development re-launched the "sustainable shopping basket" in 2008. Also, an internet forum for a related discussion was initiated in 2009. This forum however, still lacks significant participation. Another project initiated by the Council encouraged the exchange of innovative ideas and activities, and also fostered discussion on the Internet platform "Mission Sustainability" (see http://www.mission-sustainability.org/). Since the launch of the platform in 2006 more than 320 contributions have been counted.

5.3. School System and Vocational Education System

The sustainability strategy formulates the aim of "continuously improving education and vocational training." One indicator (indicator 9a) is the percentage of early school leavers, with the formulated goal of reducing the proportion of early school leavers to 9 percent by 2010 and then to 4.5 percent by 2020. A second indicator is the proportion of university graduates aged 25 years (indicator 9b). The third indicator is the share of students starting a degree course (indicator 9c). The share of foreign school leavers with a graduation certificate is used in the chapter Social Cohesion / Integration of foreign citizens (indicator 19). Their share should align with the level of German school leavers. In the RNE traffic light report, the share of students who start a university education (9c) is rated

"green" as only education-related indicator, all other mentioned indicators are rated "red" (RNE 2008).

The organisation of education systems is under the responsibility of the *Länder* governments. Interviewees reported difficulty in integrating SD into class schedules and curricula. While there were at least a few school projects aimed at enhancing pupils' interests in technological questions, such initiatives are lacking for social sciences, according to the interviews. Overall, the schooling system in Germany appears to be underperforming (OECD 2006a, 2009a)

Germany, as a high-tech nation, needs a professional workforce. This need will increase as climate change is addressed and Germany proceeds towards becoming a low-carbon society. The vocational education system, which offers both an education in practical working skills as well as hi-tech knowledge, will need to adapt and take on a special role. While the German system is unique and internationally highly valued, there are shortcomings and challenges that need to be addressed.

The system's ability to renew itself has proven to be remarkable in the past. Within any given year more than a dozen new or reformed training positions (*Ausbildungsberufe*) are added to the pool offered by the vocational education system in an attempt to keep up with the economy's dynamic demand. For example, all vocational regulations that are important for most of the jobs in the renewable energy sector were last amended in the early 2000s or late 1990s (BMBF 2007). In 2005, a comprehensive amendment to the basic legal text for the vocational education system paved the way for improved performance.

On the other hand, it appears as if these actions may not have been sufficient. There remains a significant gap between the number of training positions offered and demanded, even though the situation has improved to some extent (Bildungsbericht 2006 and 2008). Lately, the shortage of training positions remains relatively stable at about 13 percent, or 80,000 training positions. The lack of qualified training positions is underscored by the fact that in 2006, 40 percent of all 1.2 million participants in the system were stuck in the transfer system (*Übergangssystem*), in which only soft skills are taught in order to prepare young people for formal courses in the dual system (*Duales System*) or the school vocation system (*Schulberufssystem*).

There is also a large and apparently worsening gap between the economy's demand and the provision of many technology-oriented qualifications. In 2006 alone, this gap is believed to have cost the German economy about €18.5 billion (Koppel 2007: 30). In jobs related to steel, electronics and building—three key sectors for a low carbon future—

demand has continually increased, while the number of vocational education diplomas signed has decreased (Baethge et al. 2007: 8).

The system performed poorly in the past particularly in regards to social segregation and immigration (Baethge et al. 2007; Bildungsbericht 2006). Immigrants are disadvantaged in several ways. They are much more likely to attend a *Hauptschule*, and more than twice as many do not get a degree compared to their German counterparts. In addition, the graduates of the *Hauptschule* are disproportionally unlikely to enter the dual system or the school vocation system and disproportionally likely to enter the waiting loops of the transfer system.

As a result, in 2005 only 4 percent of all participants in the dual system were immigrants, while their share of the total population in that age group is much larger. This translates into what some authors call a "double disadvantage" because, in Germany (as in nearly all OECD countries), immigrants perform worse in basic school skills compared to their national peers (Geißler and Weber-Menges 2008). This is due to substantial barriers for immigrants and their children in the German school system and society. The barriers are manifold: missing bilingual education concepts, prejudices against their intellectual capabilities by teachers and potential employers, precarious economic and living situations, as well as an often insecure and precarious residence permit status—to name just a few barriers. Hence, they become increasingly disadvantaged as they grow older. In the case of vocational education, about 42 percent of immigrants do not have a vocational degree, compared to 13 percent of Germans aged 25-34 years. Reforming the vocational system alone, however, cannot solve this problem. Measures have to be taken much earlier and must include the whole educational chain, especially the (elementary and secondary) schools, address the economic situation of marginalized families and legal questions to counter the often precarious residence permit status.

To overcome both the lacking training positions as well as the demands of green tech industries, the BMU has created a new program called "Environment Produces Perspective," which in 2006 invited employers and organizations from the growing branches of environmental technology and renewable energy to join the program and develop apprenticeship-training positions. Since then, 40 employers and organizations have worked on the initiative to create over 6,000 additional apprenticeship-training positions in 2009.

5.4. Smart Solutions

Germany, the self-titled "Land of Ideas" and a technological leader in many sectors, uses a number of smart solutions to reduce the ecological impact of human activity. In the environmental technology sector (e.g., wind power and solar energy), companies have ac-

cepted the business case for sustainability and lead the field internationally. Germany also holds a strong position in measuring and controlling technology, which plays an important role in export as well as in environmental impact assessments (Haroff 2009). German businesses rank high in offering systemic solutions.

Smart solutions are not restricted to technological ones but instead comprise social innovations as well, such as new instructional concepts and flexible working hours. However, smart solutions aimed at behavioural changes often face greater resistance than technological innovations, as they tend to be system changing and often must grapple with incentive structures, social expectations or consumer habits (Sustainable Development Commission 2006: 59; Gillwald 2000: 19f). In the area of mobility, for instance, car sharing is a good example of the environmentally friendly use of resources and offers a real chance for reducing emissions. Although car sharing increased in Germany during 2008, it still represents only a small fraction of the potential customer base (Bundesverband CarSharing e.V. 2009). The reasons have to do mainly with emotional attachment: A car is status symbols and reflect in part their owner's identity (Opinion Leader Report 2006: 12). Other examples of social innovation such as eco-villages or give-away markets have also found little acceptance among the general population.

Another example from the mobility sector is electric cars. Here, again, demand has been low in the past and only grew recently due to price increases for petrol. To overcome this lack of demand, a technological breakthrough is needed in the areas of practicability and range. According to an international study carried out by the polling firm TNS/Infratest and the automotive supplier Continental, consumers are already showing signs of changing their views of electric cars for city driving (Continental 2009). However reliance on lithium as major component of batteries for electric cars could hamper further growth in the electric cars market. A study by consultancy company Meridian International Research identifies the following problems: available amount of lithium world is probably not sufficient to meed manufacturers demand, depletion rates would exceed current oil depletion rates and switch dependency from one diminishing resource to another and the location of lithium sources could potentially create new geopolitical tensions (Tahil 2006).

Other technological breakthroughs are needed too. Fuel cells have not realised their full potential due to current technological limitations (Temming 2005: 142ff). More research is needed so that they can be applied in a wide range of industrial sectors.

What might hamper the development and deployment of smart solutions is the fact that the German government is sending out inconsistent signals as some of the interviewees pointed out. For example, in the Sustainability Strategy, one of the targets is to reduce the

area needed for settlements and traffic and to reduce traffic-induced ecological damage. However, the current package promoting economic growth foresees the upgrading of motorways and a premium for scrapping an old car when purchasing a new one ("Abwrackprämie"), which is unconnected to ecological criteria (VDC 2009). Moreover, legislative initiatives to create car-sharing stations on public roads are being promoted by the Ministry of Transport but at the same time blocked by the Ministry of Economics (Bundesverband CarSharing e.V. 2009).

International Cooperation

Germany is a world leader in the export of environmental technology. It also ranks top among OECD countries in terms of R&D in the area of the environment (OECD 2009b: 120f). In addition, Germany is or has been a member of several initiatives aimed at international cooperation on low-carbon issues, including the BRICS+G Sustainability and Growth Dialogue, the UN Global Compact and the International Transport Forum. Yet the scope of these initiatives is limited and few actors are or have been involved. Cooperation on low-carbon issues remains low on the agenda for many countries.

Further examples of bilateral partnerships include German-Chinese cooperation on renewable energy within the transport sector, collaboration with Russia and Ukraine on the energy retrofitting of buildings (BMVBS 2009: 12), and the joint working group in the automotive sector with India (Auswärtiges Amt 2009). Several city partnerships also exist within the Large Cities Network C40 and ICLEI; these organisations could serve as forums for cooperation to advance LC urban development.

As international low-carbon markets evolve, technologies and policies that have proven to be successful are becoming common practice in many countries. Indeed, several countries have gone beyond reproducing low-carbon solutions; they are now enforcing the minimum Kyoto requirements and are actively cooperating with the development of new low-carbon technology.

The UK and China have recently agreed to a partnership on intellectual property with the aim of reducing backlogs and delays in patent procedures. The system guarantees that intellectual property rights be respected, while facilitating the dissemination of low-carbon technology between the countries (UK Foreign and Commonwealth Office 2009). This partnership reflects a major change in government mindsets. In the past, industrialised countries feared the possibility of reverse engineering by developing countries trying to reap the fruits of expensive research and development (R&D). Today they are seeking cooperation, recognising that many developing countries also conduct high-level R&D of their own. This is very much a two-way street, with overtures coming from both industrialised and industrialising countries.

To keep up with other countries, Germany must increase its level of international cooperation on low-carbon issues. The potential benefits of such cooperation are threefold:

- First, it will ensure that the technology and policies used in Germany are state of the art;
- Second, it will bring enormous economic benefits. Germany needs to participate in the setting of regulatory and technical standards so as to avoid the risk of high adoption costs if others take on this role.
- Third, it will give Germany political leverage. Germany and its partners for a low-carbon future can lead by example. Germany's own impact on climate change mitigation will benefit from identifying best practices, which can then serve as the basis for international standards. This in turn will facilitate low-carbon development in other countries by reducing transaction costs (solutions and standards can be adopted rather than re-invented).

In ensuring low-carbon development—nationally as well as globally—Europe plays a crucial role for at least three reasons. First, member state policies are ever more affected by European regulatory and financial measures. Common efforts by the member states and the EU are necessary to make sure that those measures with long-term impacts (e.g., energy mix and infrastructure planning) do not run counter to emission reduction targets. Regulatory policies, as well as upcoming financial perspectives (2014 to 2020), need to be assessed against these targets. Second, as several experts stated during the interviews, the competition among European member states often impedes low-carbon development on the national and sub-national levels as several low-carbon measures are thought to have negative economic impacts. In these cases, further harmonisation of public procurement criteria, for example, might be an option for the EU to prevent competition from generating negative externalities in the form of CO_2 emissions. Third, to ensure successful international cooperation, common and coordinated low-carbon action by the EU is essential.

SD as a Business Case

Environmental protection is an economic factor of growing importance for both industrial production and the job market. Accordingly, some German businesses have made serious attempts to meet the challenges of SD, positioning themselves as "sustainability leaders" in certain sectors. However, it remains difficult for most decision-makers in German companies to grasp the business case for sustainability. As pinpointed in the expert interviews, many businesses fail to see the benefits of sustainable strategies, such as the returns from being a pioneer in new markets; indeed, the motivation to be a pioneer is often

low or non-existent. Although topics such as cutting CO_2 emissions are widely approved by society, few companies have taken independent action. As the expert interviews revealed, most current activity appears to result from risk aversion rather than a proactive understanding of the benefits available. Business action is further thwarted because environmental, social and governance (ESG) impacts are given insufficient weight.

Another barrier in this context is the lack of an appropriate regulatory framework, which companies claim is needed in order to be able to adopt more sustainable patterns. Expert interviews reveal that the current situation is not believed to be supportive with regard to identifying the sustainable business case.

Sustainable Consumption

Of course, businesses cannot deliver SD entirely on their own. Consumers need to drive the demand for low-carbon goods and services, and voters need to support low-carbon policies. Germany presents an inconsistent picture here. On the one hand, in areas such as clothes or furniture, business practices and production methods are not questioned by the majority of consumers. Companies believe that consumers are indifferent, and consumers do not see themselves in a position to influence existing conditions (RNE 2007: 11). But in other areas consumers increasingly base their purchase decisions on ecological and social criteria. In the food sector, for instance, demand for organic and fair-trade products has grown consistently over recent years. LOHAS consumers (see above) represent a growing sector, currently estimated at almost 12.5 million people aged over 14 in Germany (Ernst & Young 2007). Consumer awareness of ecological and social issues and their readiness to alter patterns of consumption therefore show potential for change, but to date action has been limited.

To broaden the discussion on sustainable lifestyles the German Council for Sustainable Development currently seeks distribution partners for its “sustainable shopping basket.” Through their websites, two retail partners and an automotive manufacturer will increase the availability of the brochure in their retail markets.

The state itself is a major consumer. “Green public procurement” has been on the political agenda for some time already, but with no major achievements to date. Green goods account for just 30 percent of the total volume of public procurement in Germany, compared to 74 percent in the UK (PwC 2009: 32ff). The enshrinement of EU initiatives in German law has progressed very slowly, fostering insecurity on both the buyer and seller sides. In 2008, in the course of this process, a regulation on the procurement of energy-efficient products and services was passed; it is binding for all Federal departments (BMWi 2008b). Nevertheless, many municipalities—which are where most procurement in Germany occurs—are still unaware of the new regulation.

To maximise the impact of public procurement, the state itself needs to promote and invest in green procurement. The current economic stimulus package is an ideal opportunity to support SD. The premium for scrapping old cars when buying a new one could be modified to subsidise the purchase of energy-efficient cars, for example.

Government plays a key role in setting the framework for sustainable consumption. A shift towards more sustainable consumption patterns in society relies on strong political backing and consistent signals from the government. The potential of low-carbon goods and services has not been fully exploited by governmental policies and procurement. It is an important achievement that SD procurement has been placed on the agenda. However, concrete action has to follow to overcome the view that there is a lack of commitment on its part to achieving a low-carbon society. Communicating the benefits of a sustainable lifestyle to consumers is particularly difficult when public role models are missing from the scene.

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