

Carbon Mitigation Action and Adaptation to Climate Change: The German Perspective

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It is an honor to address this particular audience, and I thank the organizers and the German Embassy to make my contribution possible.

The organization I work with is a civil society body reporting back directly to the Federal Chancellor Angela Merkel. She appoints its members from policy making, the private sector, environmental NGOs, the churches and trade unions, agriculture and the media. In agenda setting and taking action the Council is independent. Its task is to help making the public administration fit to address sustainability. Chancellor Gerhard Schröder first set up the Council in 2001, and Chancellor Angela Merkel has continued the work of the Council at the interface of politics, policy concepts, science, and communication. In spite of the all too wellknown prejudice that sustainability means talking about everything and, therefore, ending up with not doing anything, the German sustainability policy proofed the usefulness of vision and perspective to enforce and to guide concrete action being taken.

I am happy to tell you that, today, the German Government releases its 2008-Progress Report on the National Sustainable Development Strategy. This strategy provides the overall frame for crucial issues such as climate change policies, resource productivity and demographic change. With this report the Government decided on several improvements in the institutional setup of the German Sustainability policy. Frankly speaking, climate mitigation and adaptation as part of the sustainability agenda needs Countries to massively build-up capacities of excellence research, policy advice, and institutional management – well beyond the traditional silo thinking.

I

Climate and energy policies are closely linked. Modern economies need both a reliable energy supply and long-term, sustainable economic growth.

If ever there was a time to change the way we are dealing with energy issues, this is that time. If ever there was a global problem we needed to address more vigorously than we did in the past, it is climate change and the non sustainability of the way we are generating and consuming products. For this to tackle, traditional political thinking won't be good enough. We have to find new ways, technologically, economically, socially. The integration of these is exactly what sustainability strategies are aiming at.

We have to think globally. And there is the case for multilateral global action. But while we are negotiating global policy options we must not wait for global action to be implemented.

That is a notion commonly shared in German politics. There is a strong case for dedicated and ambitious concepts for a frontrunning role as a nation. We can and we must act nationally. That is where

- we have the choice;
- we can build up the business case for sustainability;
- we can gain jobs and develop innovative und competitive capacities;
- people on the ground can be reached and can get themselves involved.

In Germany, the neuralgic points of the energy and climate policies are: renewables, coal, nuclear energy, energy efficiency, emissions trading. They are all highly controversial in Germany. So is the only now beginning debate on the German adaptation strategy. My talk will lead you through these issues. But my point of departure would be the big picture of *carbon justice*.

Carbon justice is the key concept for a worldwide policy that fairly shares the burden of reducing emissions: the vision of a per capita allowable amount of greenhouse gas that would be the same around the globe. I see this concept in line with the idea of one-man-one-vote. In human history it took more than a hundred years to spread the notion on one-man-one-vote. With climate change at hand, we will not have that long time to understand what it means to implement the principle of one-man-one-vote-one-carbon-footprint. We have to be faster und more reliable.

German Chancellor Angela Merkel has brought up the concept of carbon justice on a number of occasions and we fully support her on this.

But clearly, any carbon justice scheme is a long shot, as is the concept of sustainability. But it is always good to have a clear aspiration that gives people a telling perspective, and provides a certain sense of urgency.

Addressing a Canadian audience, I must not forget to highlight that we have to find the keys for a yet all too long missing new era in transatlantic climate and energy policies. Therefore, the German Government, in particular the Foreign Office and the Ministry for the Environment invites all to build a transatlantic "climate bridge". Working together closely across the Atlantic is an important precondition to convince emerging economies such as China and India to adopt a sustainable and climate-friendly growth model.

II

In March 2007, EU member states made an historic commitment to reduce our CO₂ emissions by 20% by 2020 while increasing the use of renewable energies to 20% and increasing energy efficiency by also 20% over the same period.

The triple 20 commitment lays the ground for the climate strategies in Europe. The commitment includes a clause whereby the CO₂ reduction target would be upped to 30% in the event that an international climate deal is reached under UN auspices. On the national level, Germany is committed to go for 40% if the EU will be good for 30%.

In these days, the French EU Presidency makes it clear that the EU is to pursue with determination the diversification of energy sources, and develop crisis mechanisms to deal with temporary disruptions to supplies. It will expedite the implementation of the European Energy Efficiency Action Plan and the Strategic Energy Technology Plan, and finalize the legislative package on the internal market in electricity and gas before the June 2009 elections of the European Parliament.

There is no doubt that Europe will have to do even more than this. The agenda is long. The most important points are that Europe will have to strengthen critical infrastructure, particularly trans-European energy transport networks and the trans-European logistic lines for the transport of goods and people. Europe has to add new features for energy supply: an infrastructure for liquefied natural gas, a sustainable biomass production.

For the triple 20 commitment to work its way into reality an implementation plan is needed. This is called the EU's package of energy and climate. Finding a consensus on the package is not easy. There are significant divisions between member states. Tough decisions on the burden sharing have to be taken. The political and economic cohesion within the European Union requires Member States to follow the idea of common but differentiated responsibility – to recall the formula of the Rio-Agenda 1992.

Currently, you see Europe in deep struggle. The package was scrutinised by the European Parliament as part of the standard legislative procedure. The 'ball' is now in the court of member states. Several EU states show reluctance to pass and implement the package. They say it is too costly, it is not in line with their national – mostly coal-based - energy options. Some of them even suggest postponing the triple 20 commitment, and with this would dare to undermine the EU's credibility as a frontrunner in climate change policies.

The most important point here is even more basic. The question is: Can Europe prevent the economic turmoil from derailing our ambitious triple 20 commitment? The current crisis on the financial markets could draw attention away from climate protection. This is a risk. But in any case it is going to be difficult to reach an agreement on a successor instrument to the Kyoto Protocol in Copenhagen in 2009. The economic crisis will make this even harder. The financial meltdown is more visible, more tangible. But economically spoken, it is climate change that is the more serious problem in the long term. Boldly put, if a bank goes down the drain the market economy will survive. But, if the polar ice shelf goes down, an awful lot of things will go down, too.

Member states and EU Presidency have pledged to clinch a deal on the package at the next European summit scheduled to take place in Brussels on 11 and 12 December. For the EU climate diplomacy this decision will be the acid test.

III

Around the globe Germany faces great expectations that we will play a leading role in tackling the issues of climate and energy. Germany has a record of ambitious climate policies, be it the feed-in-tariff, be it the rise of the renewable energies, be it the restructuring and transition of the Eastgerman industries that was successfully used to decrease the carbon score card, be it the green tech industry.

Fortunately the frontrunning gets rewarded by a stunning economic success. The total turnover in renewables energies in 2007 was about 25 billion € (11 from construction, 14 from operations). The renewables export rate increasing: Wind 70%, Solar 30%. In 2007, we had 250.000 jobs related to renewables energies (leave alone the green tech market in general), and counting. Where the green tech market is assessed to be worth today 1000 billion € it will double its worth by 2020 as major industrial consultancies assume. Germany has a share of 4 %, and sets out to develop into 10 %

This record is demonstrating the new approach that links ecology and economy. This link is possible. Ecology, economy and the social aspects are not controversial in principle. They don't exclude each other. But to bring them together is not as simple as that. Nor does it work out automatically, neither does shere voluntary concepts work out. Conceptually, it needs an ambitious approach using the concept of sustainability in the sense of: Meeting the needs of the present without compromising the ability of future generations to meet their own needs. And it needs a regulary approach because the business case for sustainability and carbon mitigation does not come out of the blue. The state has a responsibility in setting up incentives and regulations that help create this kind of market.

Renewable energies

Can Germany realistically increase the share of renewable energy in the overall electricity generation to 30% by 2020? Germany can achieve this goal if the singel most important part – the put into operation of offshore wind generating parks in the North Sea – will be achievable in due course.

People tend to still conceive renewable energies, in particular wind and photovoltaic solar, as intermittent and unreliable. And it is true, we do not have constant wind and we do not have plenty of sunny days in Germany. That is why renewable energies need backstop energy plants. Our experts, however, say that this won't be necessary forever. It all depends on the grid. Smart grids can controll flexibility. With technological improvements there obviously is a chance to make renewables even suitable for base load generation.

German companies are international pioneers in renewable energy, and particularly in wind technology. A large proportion of their production is destined for export. Global demand is high. Wind energy is a provider market. Such markets are always at risk. In order to remain a leader on a dynamic market, you cannot rest on your laurels. The installation of offshore wind power units is clearly behind schedule. Manufacturers of these units have too few incentives to speed up investments in this technically demanding and risky future market since the German locations in the North Sea are in water that is up to 40 meters deep, which entails considerable technical and financial risks. The order books are filled thanks to buyers from around the world. This makes it more profitable to sell tried and tested technology than to invest in new technologies – and tends to put the brakes on innovations. The required infrastructure to transmit the North Sea power to land still needs to be built. It is a shame that highly advanced technology for high-voltage transmissions lines developed by German companies has been sold to China, but still has not been used in our own country.

The rise of renewables energies is subsidized by the feed-in-tariff mechanism. In the first place, feed-in means that you are given the right to feed renewable energy into the grid that you have produced on your own. You get paid for the feeding in whereas the energy utility is

obligated to accept your input. In history, no energy transition ever came in cheap. The first kilowatt-hour generated by nuclear power plants was extremely expensive, as was the first solar energy. After this, costs are a function of the scaling-up mechanisms. That is why the feed-in-tariff legislation features a system of degression of the feed-in payments. This translates into an incentive for the solar industry to be more productive. Solar industry, as a matter of fact, manages to yield a productivity increase of about 8 – 10 % annually. The feed-in payment is subsidizing the power generator – but, in legal terms, it is neither a subsidy nor a tax. The idea was to bypass the public debate on eco-taxes because, for the time being, it is obviously hard to publicly defend any new eco tax.

In Germany, electricity and gasoline prices include substantial taxes. The eco tax is – among other regulations – behind these efforts to put a price tag on carbon and on energy. The ecotax is not an easy going political subject – but it is clearly the simplest and effective driver for innovation.

Nuclear energy

Germany decided to phase out existing nuclear power plants and not to replace them by new nuclear facilities. That is the current political consensus. The main arguments against nuclear power remain as valid as ever: the growing threat of proliferation and terrorist attacks, the susceptibility to failure of all technical facilities, and the still unsolved issue of longtime storage of nuclear waste.

For the sake of the argument I will let aside the “old” arguments against nuclear energy, and ask whether the urgency of climate change shades a new light on nuclear energy. Indeed, carbon emissions are increasing so rapidly all around the world. The impacts of climate change and the run up towards the natural tipping points sets the time frame for any proposed solution to the climate challenge. So, my point is that for getting nuclear facilities operational in a scale that would make a difference, and would ease the burden on the climate there is simply not enough time. Currently, there are 439 nuclear power plants integrated into the global power grid, many of them ageing facilities, with a total share in the world’s energy supply of just 16%. If political measures to address the climate issue were to rely on the nuclear power option, not only would existing units require modernization, but an additional 1,000 to 2,000 new facilities would also have to be built. This is impossible for a number of very practical reasons. For the purpose of climate change, nuclear energy is a dead end.

The coal issue

In Germany, we have a lively and fundamental debate on the future of coal powered energy plants. Fossils are a hot issue. Germany relies heavily on coal. According to most assessments, the proportion of coal in the global energy mix will not fall under 30% by the middle of the century. So, there is serious reason to thoroughly rethink the future of coal. In Germany, the pure environmental thinking proposes a moratorium on fossil fuel power plants. Others suggest replacing coal by natural gas, which then would increase other one-sided energy dependencies. Finally, there is the notion that refraining from coal would mean – in a way a hidden agenda – to backdoor-phasing in nuclear energy again.

The CO₂ metrics are quite clear. The next generation of coal power plants – if constructed in the traditional way, slightly more efficient, but essentially emitting masses of CO₂ into the

atmosphere – would block a huge carbon emission base load into Germany's mitigation efforts. The German and European climate policy would be likely to lose credibility due to high emissions. Larger emissions from new fossil fuel-fired plants are thus incompatible with the climate objectives for 2020 and 2050. There is one solution at the horizon that might or might not turn out as an adequate escape. That would be the option for the carbon load to be captured and safely stored away. The so called CCS technology seems to be feasible, technically, economically and environmentally. At least, there is good reason to believe that we should proof the feasibility as fast as possible by building demonstration power plants.

The CCS option is by no means certain. There is a possibility that the technologies will not be available, or that the required reliability will not be achieved on time. But this is no reason to remain idle. Quite the contrary, Germany's proud tradition in energy technology obliges us to lead the way to a world with less CO₂ thanks to new technologies.

There is one major bottleneck for further investments into CCS technologies. That would be an overload of confusion and uncertainty as regards the regulatory framework, the future carbon price, society's support. That is why the Council for Sustainable Development, in a most recent recommendation to the Federal Government, asks the Government to come up with a clear legal requirement that after 2015 no coal power plant without carbon capture and storage (CCS) will be certifiable for operation, and that when it comes time to agree on a successor to the Kyoto Protocol, in other words, after 2010, every new fossil fuel-burning plant must be upgradeable (CCS-ready). Finally, and already possible today, all power plants currently in operation that release on average more CO₂ than the respective average hard coal or lignite power plant should undergo improvements.

What the Council recommends is basically a regularly approach that requires an amendment to the German Federal Emissions Control Act. The basis for this would be the recognition that the CO₂-hazardous-waste must no longer be released into the atmosphere in an uncontrolled manner. The world currently releases 100% of the CO₂ that we produce into the environment. This is reminiscent of the waste disposal practices of the late 1960s. That was when the recycling economy was created.

The current enormous challenge with respect to sustainable development is to find ways to channel the captured CO₂ into a cycle instead of simply storing it away. It sounds awkward, and every chemist would say that this is wishful thinking. A carbon cycle will never be achievable because of the entropy of solar power.

But if you go a little back into the history of environmentalism you see that we did it before. Back in the 70th we were challenged by foam on the rivers, sulfur in the air, waste piling up to what we then called Garbage Mountains. You do not see this any more in our Countries. We learned how to recycle, and how to impose recycling rules on vested interests. Why don't we try it again? This vision is more complex and more difficult to bring down to earth than what we had before. Its R&D implications are nothing short of a new Apollo program.

The power grid

The relevance of grid issues for a sustainable energy supply have long been underestimated. There are a wide range of technologies being developed today that would allow us to organize our electrical grids far more intelligently, thereby significantly increasing their efficiency. For

instance, it should be possible to use the grid to store energy, or to introduce an intelligent power load management system that would allow for new measuring and monitoring processes that focus on the demand side. Decentrality will be key.

Demand side efficiency management

For decades, the demand side of the energy issue has been sorely neglected. Time and again, sweeping declarations are made, but there has been very little follow-through. It is time for the demand side – in particular with regard to the issue of energy efficiency – to be finally placed at the top of the agenda.

Today, we use 40% of our energy consumption to heat our buildings. We would be far better off applying simple and even relatively primitive methods and technologies to reduce energy use in buildings – creating jobs in the process – than focusing solely on the search for the best high-tech systems to solve all our energy problems.

There is clear evidence that greening the demand and the economy provides more “negative costs” than generally expected. That means, the money is on the streets, and you might make a fortune by just saving energy. Add to this those costs reflecting reasonable carbon price signals of 20 €/ton CO₂ than the result is overwhelmingly underlining the business case for meeting a carbon neutral demand side management.

Demand side management is also a question of lifestyle policies. The word is awkward because the state can not regulate individual lifestyle, nor should he try to do so. However, in civil society there is a lot of talk about lifestyles and we see lifestyles being changed, reshaped and developed all the time. And rightly so, because we spend money that we do not (all) have to buy things that we do not (all) need, in order to develop a lifestyle that the earth can definitely not afford. Even worse: This lifestyle is a role model for the emerging economies all over the world. This captures us all into an impasse.

Carbon pricing

Both, climate mitigation and a low carbon economy need adequate price signals, no matter whether they come from a cap and trade approach, from eco taxation, or from a mixture of both.

The European Union started the worldwide first carbon cap and trade system. It is a worthwhile effort to study European experiences, the bad and the good ones. True, at first we implemented the emission trading scheme with an overallocation of certificates. That ended in a carbon trading more similar to horse trading instead of fluid markets.

But the learning curve is steep. Markets, including emissions markets, operate on the basis of trust and transparency. Such a degree of transparency must be established by the state. This holds true for calculating the cap (the upper limit of total emissions) and monitoring systems. The auctioning of emissions allowances (as opposed to the grandfathering) is a useful approach. However, full-scale trading of emissions could have undesirable consequences for Germany as a location for industrial production, and also for other countries in Europe. These could be of a structural and political nature, because certain industries would be driven out of the country. Their carbon load would be exported. The leakage problem is something that

needs careful studies (which are on the way in Europe). It is essential that the international trading of emissions should be established as quickly as possible. This will have to be accomplished in stages.

The concept of price signals proves the point – once again - , that voluntarism is no concept. The market won't do it all by himself. The evolving of new markets need smart regulation and public administration. Vice versa, it is also true that with a not so smart regulation you will see any markets die away.

Adaptation

I agree that there is a case for adaptation. It might be more important than, in Germany, we perceived in the past. We see first signs of climate impacts in our environment. We see

- the impacts of melting permafrost in the Alpes;
- the need to reconfigure water and land management;
- public health effects and biological vectors;
- the need to empower the dyke system and parts of the infrastructure;
- that climate change is a challenge for the breeding of adapted plants and species.

These indications give reason to further investigation. Sustainability strategies give reason for redesigning research for sustainability. Germany attaches special importance here to networking core competencies. We have a Federal framework programme in place called “Research for sustainability”. It is developing social strategies with the goal of meeting fundamental needs while minimizing the risks for the long-term stability of nature and society. It is also gearing globalized production value chains to sustainability and shaping the long-term competitiveness of the economy. Finally, it focusses on how to transform regional development and how manage natural resources on a long-term basis. “Science for Sustainability” needs a good disciplinary understanding of causes and impacts. Interdisciplinarity and complexity are the key issues. We need a fresh approach on how to tackle the policy – science interface. It is a vice-versa issue. We need to get science involved, and convince them to address the challenges of non sustainable pathways. And we need to get politicians to listen to science.

The adaptation agenda for Germany has to be taken serious. But honestly, compared to more vulnerable regions in the world, our upcoming adaptation requirements are less than marginal. Many parts of the world face severe and unavoidable climate impacts, making it necessary for us to consider and debate suitable adaptive initiatives that will pave the way for credible aid. Germany has a responsibility to live up to here. And by the way, our technological and political capabilities will only remain cutting-edge as long as we stay in tune with precisely these future requirements.

IV

Germans are not exactly well known for developing what in Northamerica is called a can-do-mentality. But, against what is regularly told about the German mindset we already developed a strong set of can-do-notions when it comes to renewable energies and sustainability approaches. We have a clear understanding that we have to improve steadily. And – given the boldness and urgency of the challenges – we must not sit on our hands. Literally spoken, the

driver seat to lead the climate mitigation and adaption is large enough for others to join the frontrunning row, to fast follow and even leapfrog.

I thank you for your attention.