



Robust options to combat global climate change

Background Session II: From “business as usual” to creating a novel global energy system

The release of the report “Climate Change 2007” by the Intergovernmental Panel on Climate Change in February alarmed the international community. The finding that the climate change problem has been underestimated in the past triggered numerous initiatives to cut greenhouse gas emissions. On the other hand recent scenarios for the 21st century show that the demand for energy will grow substantially – especially in the developing countries and emerging markets. The growth will exceed the gains through improved energy efficiency and switching to less carbon-intensive fossil fuels. Overall emissions are expected to increase in the business-as-usual case and to induce growing global mean temperature changes.

To avoid a dangerous interference with the climate system, global emissions must decline significantly over the coming decades. This requires a comprehensive global mitigation effort, including a further tightening of existing climate protection strategies in industrialized countries and a simultaneous participation of developing countries. Improving energy efficiency is necessary, but it is not sufficient. The emission-lowering potential of switching to less carbon-intensive fossil fuels, i.e. to replace coal by oil and subsequently oil by gas, is restricted, since these options are also included in the business-as-usual case.

But there are further options: Capturing carbon from fossil fuels and storing it underground or in the deep ocean does imply higher costs but it can play an important role, at least as a transitional bridging technology. The reduction of non-CO₂ greenhouse gases can help achieve climate protection targets at substantially lower costs than with efforts that address CO₂ only. Land-use related mitigation options, to reduce deforestation and to afforest, are cost-effective and could provide up to 40 percent of the total cumulative abatement.

In addition, zero- or low-carbon energy conversion technologies exist. Their potential suffices to meet even the highest projections of the global energy demand projected for 2100. The available wind potential alone would be hypothetically able to cover the entire primary energy demand of the world in 2005. Even higher potentials are estimated for solar and geothermal energy. Innovative concepts are available to mitigate the drawbacks like the intermittent availability of wind and solar energy. Renewables are in principle able to substitute fossil fuels completely, but further research is needed to design integrated systems that exhibit low costs for the services envisaged here. All of these efforts add up to the creation of a completely novel global energy supply system, which would take many decades to implement. This means that the emissions mitigation measures must start immediately and increasingly involve the entire world. The ultimate goal is a zero-carbon global society.

The costs would be less than one percent of gross domestic product assuming a reasonable price for carbon. Without it there are no incentives for firms and investors to apply low carbon technologies. Therefore, the design of a worldwide carbon market is the challenge ahead. Chancellor Merkel has proposed a carbon trading system allowing the reduction of emissions according to the 2°C target and implementing at the same time an allocation scheme which endows each citizen with the same emission right. This proposal presupposes a global carbon market – otherwise the costs imposed on industrialized countries would not be acceptable. Moreover, negotiations have been started to link the European emission trading scheme with schemes emerging in California and elsewhere in the US. International emissions trading, and related flexibility mechanisms, are core elements of any post-2012 regime.
