Concept for a Future Climate Policy

Plotting a New Course in 2009

Summary

Umwelt Bundes Amt
Für Mensch und Umwelt

| CLIMATE CHANGE | 15/2009

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Umweltbundesamt
(German Federal Environment Agency)

UMWELTBUNDESAMT

This publication is only available online. It can be downloaded from
http://www.umweltbundesamt.de/uba-info-medien/mysql_medien.php?anfrage=Kennummer&Suchwort=3881.

Publisher: Federal Environment Agency (Umweltbundesamt)
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Dessau-Roßlau, October 2009

Introduction

Climate change is one of the greatest challenges facing humanity. Scientific knowledge about the impending threats as well as knowledge about possible options for action have increased considerably in recent decades. Particularly alarming, in view of expected climate change, is the IPCC's fourth assessment report, published in 2007. At the same time we are observing an increase in the global emissions of greenhouse gases – the cause of anthropogenic climate change.

This makes it all the more important today to set the necessary course for the future. There is a need for a permanent change in trends, favouring mitigation of and adaptation to climate change in the economy and our entire society. The politicians can and should also address the current challenges of the financial and economic crises while also taking mitigation and adaptation into consideration.

Although the situation is very serious, the framework conditions are not discouraging, since the technology is already available to reduce greenhouse gas emissions, to completely convert to domestic renewable energy technologies, and also to conduct sustainable agriculture and forestry. In view of the consequences of climate change, though the costs of mitigation are foreseeable, they are not decisive. Furthermore, regarding adaptation to climate change, the necessary knowledge and many technologies are already available, particularly in Germany.

The sooner we act, the more time we have to make the necessary technical and social adaptations – involving not only a fundamental change to our economy but also to our lifestyle. A start was made towards effective mitigation and adaptation with the UN Framework Convention on Climate Change and the Kyoto Protocol. Now, in the middle of the first commitment period of the Kyoto Protocol, the international community must reach a follow-up agreement under the UN Framework Climate Convention for the period after 2012 and thus establish an important milestone for a long-term policy for sustainable mitigation and adaptation. The German Federal Government has, in reaction to existing and possible future risks of climate change, adopted the German Adaptation Strategy in December 2008.

The German Federal Environment Agency (UBA) presents here a summary of its Ideas on climate policies. We wish to illustrate how we foresee the next steps towards an ambitious set of policies for energy, mitigation of and adaptation to climate change. These proposals are based on numerous UBA publications[1].

In the first chapter we describe climate change as has already been observed in Germany and the world, as well as further possible change in the future. Tying in with this, we address the potential consequences of continued climate change. Based on the scientific justification for the necessary limit on greenhouse gas emissions, we formulate objectives for climate change mitigation and adaptation and outline the measures and policy instruments which must be adopted in order to achieve the mitigation targets. In doing this, we take into account the costs and benefits of

[1] For details visit: www.umweltbundesamt.de/klimaschutz-e/index.htm .

mitigation[2]. Finally, we consider synergies and conflicts between an ambitious mitigation policy and other environmental objectives on the basis of selected examples, while also making relevant recommendations.

In view of the economic crisis, there are isolated voices calling for the postponement of mitigation measures. But those demanding this are ignoring the fact that many of the provisions of mitigation policies make economic sense and improve the competitive position of Germany and the European Union. These provisions help to modernise our infrastructure and buildings. Renewable energy technologies are an important future market and their promotion in Germany and Europe will make it possible for business to export the relevant technology and to create jobs. Finally, the transition to a more efficient energy sector on the basis of renewable resources, will make it possible to become more independent of energy imports. Climate change policies must be achieved as part of a long-term strategy – with patience but without hesitancy, even in times of economic crisis. The consequences of an economic crisis can be overcome in the short- or medium-term, but the consequences of climate change will remain as a long-term burden on people as well as on the economy.

Thanks to our current prosperity we can afford to invest in mitigating climate change. However, we cannot afford to allow the impacts of climate change to unabatedly come crashing down upon us.

[2] The authors are aware that there are grave differences in the implementation of instruments and measures in the core areas of adaptation and mitigation.

Climate change and its consequences

1. Climate change and its consequences today

Anthropogenic climate change is certain. Over the century, from 1906 to 2005, the global mean temperature has risen by about 0.74°C. The greenhouse gas concentrations have risen markedly since industrialisation (about 1750) and haven't been this high for thousands of years. The effects on the environment are a cause for grave concern.

► Anthropogenic climate change and the consequences are meanwhile not only apparent on a global scale, nor just in terms of mean values. Climate change is also being observed on continental, regional and oceanic scales.

► Anthropogenic climate change is already impacting the natural and human environment to an alarming extent and is cause for the greatest concern for future development.

2. Future climate change in Germany and the consequences

Considerable global change in our climate is expected in the future, and it will have a rapidity and extent which is without comparison within the history of humanity. Climate model simulations for various emission scenarios show that by the end of the 21st Century the global mean temperature could probably have increased by 1.8 to 4.0 °C (bandwidth of 1.1 to 6.4 °C) compared with the period 1980 to 1999. This will result in increases in other processes such as sea level rise and the decline in the ice sheet cover. The risks to people and the environment will grow with increasing warming, but they will be heterogeneously distributed.

► In particular, areas in the low latitudes and in less developed countries will be exposed to a greater risk from the consequences of climate change in the future. Poor countries and population groups will be particularly hard hit, because they have the least ability to adapt to climate change.

3. Climate change in Germany

The climate in Germany is changing rapidly and profoundly. Without measures for mitigation, the warming trend will very likely continue through the end of this century and beyond, reaching 1.5 to 3.5 °C above the level for 1961-1990. At the same time, winter precipitation could on average increase by up to 40 percent (%) and regionally by up to 70 %. The summer rainfall would decrease by up to 40 %. Extreme events, such as heavy rainfall, heat waves or storms, could occur more frequently.

► Between 1901 and 2006 the mean air temperature in Germany rose by almost 0.9 °C. A particularly high increase has been observed since 1901 in south-western Germany.

► There were considerable regional differences in mean precipitation in the past century: In western Germany precipitation increased throughout the entire year. In eastern Germany the annual precipitation values remained constant, but precipitation decreased in the summer and increased in the winter.

4. Effects of climate change on the environment, economy and society of Germany

Climate change has an impact on the environment, economy, and society. Although climate change may offer certain benefits for regions or individuals, the net sum of the effects is negative. In addition, these effects reinforce other disadvantageous consequences such as loss of biodiversity, soil degradation and air quality problems. Particularly severe damage will be caused by extreme events.

► Extreme events – such as floods or heat waves - can result in serious health impairment or damage to buildings and industrial plants. Longer-term health risks are also to be expected from newly established pathogens and disease vectors.

► Climate change affects the hydrological balance of ecological systems and soil functions, leading not only to changes in the availability of water resources, for example for agriculture, but also to humus depletion, loss of nutrients and increased erosion. This will have consequences for the use of water and land.

► In addition to existing environmental burdens, the effects of climate change will further impair the natural functions of ecosystems, in particular relating to the production of food or the formation of new groundwater, our most important drinking water resource. The spectrum of species will also change.

5. Regions of Germany particularly vulnerable to climate change

The vulnerability of individual regions to the effects of climate change can be intensified by different landscape structures and natural resource uses. Areas which could prove particularly vulnerable are the central areas of eastern Germany, the hill ranges on both sides of the River Rhine, the Upper Rhine plain, the Alps, and the coastal regions. Urban centres are also affected. These areas are thus focal points for regional adaptation.

► Four regions in Germany are particularly affected by climate change: south-west Germany because of rising temperatures, eastern Germany because of declining precipitation levels and resulting aridity, the Alps because of the changes in vegetation zones, and the coastal regions (North Sea and Baltic Sea) because of changes in storm patterns.

► Wetlands are especially vulnerable. Here in particular the water management sector faces the challenge of providing integrated river catchment management while taking into account the conservation of aquatic ecosystems.

► Urban agglomerations are focal points because they are particularly affected by higher temperatures and heat waves.

Objectives of climate policy

6. Maximum warming of two degrees Celsius

The UBA fully supports the objective of limiting global warming to a maximum of 2°C above pre-industrial levels. The risks for people and the environment above this range are now regarded as being more serious than in the past. It is therefore right that the German Federal Government has taken the two degree target as the basis of its national and international climate policy.

► Germany should definitely adhere to the two degree target, with the knowledge that even this will involve a painful loss of ecosystems along with the associated functions and services.

► Germany should increase the broad acceptance of the need to achieve the two degree target, using a clear communication of the goal and its scientific and moral justification.

7. Reversal of global greenhouse gas emission trends before 2020

According to the latest findings, the current concentrations of greenhouse gases in the atmosphere will probably lead to 2°C of warming. In order to achieve the two degree target, humanity must stop the rise in annual global greenhouse gas emissions at the latest within the period of 2015 to 2020, thereafter reducing this without delay by 5 % annually. By the middle of the 21st Century the annual global emissions must have been reduced to half the level of emissions observed in 1990, followed by further reductions.

► Climate policies must ensure that the two degree target is pursued. This goal is also feasible as well as necessary from an economic point of view.

► Drastic and timely greenhouse gas emission reductions are needed in order to remain within the two degree target. This will require considerable investments in a low-carbon economy.

8. Sustainable development in adaptation strategies

Even a global temperature rise of less than 2°C would result in worldwide impacts, and these would be reinforced depending on the emission trends and the reactions of the climate system. The UBA is in favour of activities which support adaptation to climate change in Germany and which support the goals of a sustainable development internationally.

► Germany must integrate its adaptation goals right from the start into a broad sustainable development context.

► Germany should assume its international responsibility for climate change and a global, sustainable development, providing additional financial support to help hard-hit countries implement adaptation measures as well as technical measures for the reduction of greenhouse gas emissions.

Adaptation

9. Adaptation in an international setting

Germany must integrate climate change to a greater extent than in the past in a cross-sectional international development policy. In addition to contributing 0.7 % of the gross domestic product (GDP) towards international development until 2015, Germany should already be spending an additional 0.2 % of its GDP annually to support the adaptation activities in developing countries which are most vulnerable climate change.

► It is necessary for Germany to adopt a clear stance in the negotiations under the Framework Convention on Climate Change (UNFCCC) and to make an effective, visible contribution towards the support of more vulnerable developing countries by providing an additional 0.2 % of its GDP for their adaptation activities.

► In the implementation of the White Paper of the EU Commission “Adapting to climate change – Towards a European framework for action” Germany should identify synergies and conflicts with existing EU policies and involve civil society, the business sector, and the public sector in a dialogue on adaptation.

10. National and regional adaptation: Instruments for implementation

Identifying suitable adaptation measures requires the collection and modelling of suitably robust data on regional climate change and its consequences, followed by the presentation of these in a user-friendly manner. The implementation of adaptation measures should utilise existing instruments, develop new ones and strengthen individual precautions as well.

► The German Federal Government and the Federal States (Laender) must secure the long-term future of the existing relevant programmes for data collection and for long term observations, adapting these where necessary and improving networking in order to make it easier to access data.

► Science, policy and public administration must demonstrate transparency in implementing adaptation measures, selecting appropriate instruments and evaluating existing risks. Every individual is also called upon to implement specific adaptation measures.

► Legal instruments, above all planning policies, should integrate the necessity for adaptation to climate change and at the same time make a contribution to mitigation. The Federal Government and the Laender should provide information about adaptation measures to all planners at regional and local levels.

► The operators of critical infrastructure facilities and plants must adopt precautionary measures on their own initiative and take steps to minimise risks which could result directly or indirectly from climate change.

► The Federal Government should introduce obligatory insurance cover for damage caused by climate change.

11. Adaptation in the health sector

By means of screening and early warning systems it is possible to identify health impacts at an early stage and thus effectively reduce the associated risks. The Federal Government and the Laender should cooperate to establish or improve observation systems for climate-related health risks. Planners and users should make buildings and structures “climate-proof”.

► The Federal Government and the Laender should increase the level of surveillance of relevant factors which could lead to health effects as a result of climate change.

► Decision makers must be placed in a position to recognise health risks more quickly. Early warning systems must be developed in order to be able to counter the risks as they arise.

► The provisions of the Energy Conservation Ordinance (EnEV) and the specifications in the technical standards referred to in the Ordinance must be further developed in order to give due consideration to the increasing demand for temperature and humidity control in buildings.

12. Adaptation in environmental conservation including biodiversity as well as adaptation in agriculture and forestry

Measures for adaptation to climate change should be flexible and effective over a wide range of scenarios. In addition, they should develop synergies with other (political) goals over a broad spectrum. Legal instruments, particularly environmental laws, should take climate change into account in order to remain effective under changing climatic conditions.

► Planning and water management authorities should include ongoing and future climate change and its effects into integrated river basin management strategies and select preferential measures which conserve and strengthen the natural adaptive capacity of water bodies.

► The Federal Government should examine the existing regulations for good agricultural practice, make these more specific, develop them further and implement them consistently. The same also applies to direct payment obligations (cross compliance) to ensure appropriate land use, and to maintain permanent grassland and agricultural areas so as to increase the adaptability of the agricultural ecosystems.

► The Federal Government should make increased efforts to conserve biodiversity at all levels (biotopes, species, and genetic variety within species). This ensures the adaptability of ecosystems. For this, we need inter-connected biotope systems with corridors between well-maintained conservation areas and with continuous habitats, as well as sustainable land use, reduced pollution and an ensured genetic diversity.

► Both Federal and Laender Governments should promote farm management systems and practices which offer synergies between adaptation, mitigation and conservation of biodiversity, soil and water. Foresters should establish species-

rich mixed woodland and improve the conditions for a natural, site appropriate regeneration of forests.

13. Adaptation in further sectors of the economy

All sectors of the economy should address the risks posed by on-going and future climate change, and should develop and implement measures to adapt to this. This will not only help to avert risks, but will also be able to make use of new market opportunities. Among other things the companies should reconsider their business models in the light of the new factor “climate change”.

► Institutional investors, insurance companies, asset managers, and pension funds must re-evaluate in particular their long-term investments for possible risks due to “climate change” and work towards adaptation strategies.

► Many sectors of the economy can make a contribution towards tackling the negative consequences of climate change.

Reducing greenhouse gas emissions

14. Post-2012 climate regime

The UN Climate Conference in December 2009 in Copenhagen must conclude a comprehensive climate regime with ambitious reduction targets for the world's major emitters of greenhouse gases beginning in 2013, building on the existing architecture of the Kyoto Protocol. The regime must show the way towards global, climate-friendly developments in the coming decades, so that the two degree target remains achievable.

► The post-2012 climate regime must establish binding obligations, for example to reduce global greenhouse gas emissions by the middle of the century to at least 50% below 1990 levels, including the necessary peak in global greenhouse gas emissions by 2020 at the latest. It must further establish the two degree target as the long-term goal.

► With the exception of the least developed countries, all countries must contribute to the global mitigation efforts as of 2013, according to their common but differentiated responsibilities and respective capabilities.

15. Emissions reductions in industrialised and developing countries

As of 2013, industrialised countries must commit themselves to ambitious targets of reducing greenhouse gases by 2020 to at least 30 % below 1990 levels, doing justice both to their ambitions to play a leading role in combating climate change and to their historical responsibility. At the same time, the considerable potential for reductions in developing countries must be released with suitable instruments including international support, with the goal of achieving a deviation of their greenhouse gas emissions of 15 to 30 % below the projected reference level in 2020.

► A new climate regime will determine the emission limits for industrialised

countries on the basis of a series of criteria such as the economic capability, mitigation potential, emission reductions already achieved, the population development and observed trends of greenhouse gas emissions. For a substantial deviation of greenhouse gas emissions in developing countries it is necessary to particularly address sectors with high emission reduction potentials. Here questions of equity should also be considered, such as the polluter pays principle, the financial capacity, as well as development priorities.

► With new sector-specific market mechanisms, developing countries should be enabled to cost effectively limit their increasing greenhouse gas emissions on a larger scale.

► It is urgently necessary to reduce the emissions resulting from deforestation and forest degradation[3] as well as the destruction of other carbon storing ecosystems. A new climate regime should aim to halve gross deforestation worldwide by 2020 and halt global forest cover loss by 2030.

16. National emission reduction and targets

Since 1990, Germany has achieved considerable reductions in its greenhouse gas emissions and should continue along this path with strict mitigation goals until 2050. By 2020, German greenhouse gas emissions must have fallen 40% below 1990 levels, with a continued reduction of at least 80 % to 95 %. by 2050

► The Federal Government should commit itself unilaterally to meeting the reduction targets for 2020 and 2050 primarily through domestic action.

► The Federal Government should implement mitigation instruments above and beyond its Integrated Energy and Climate Programme (IEKP) and strengthen existing provisions, with the goal of an additional 10% reduction in emissions on top of the effect of current legislation (30 to 35%). This would ensure that a total reduction of 40% will be achieved with a safety margin and thus independent of changes in the main socio-economic parameters influencing the energy sector.

17. Cross-sector mitigation instruments

Greenhouse gases are emitted in all sectors of the economy, in private households, and in the public sector, therefore mitigation is a task for all. Germany and the EU should be ambitious in developing further cross-sector instruments such as emissions trading and energy taxes and extend these to include areas which have hitherto been neglected, such as the taxation of kerosene for air travel. At the same time, more effective and efficient mitigation requires continual harmonisation of the mitigation instruments.

► After the conclusion of the climate negotiations in Copenhagen at the end of 2009, the European Union should orient the cap of its emissions trading scheme towards an emissions reduction of 30 % compared to 1990.

► The German government should further develop energy taxation – in particular as long as emissions trading does not cover all greenhouse gases.

[3] Changes within the forest class (from closed to open forest), which negatively affect the stand or site and, in particular, that lower the biological productivity capacity and diversity.

Environmentally harmful subsidies, such as tax concessions for kerosene and agricultural diesel, distort competition and should be eliminated.

► The legislators must continue to harmonise the various mitigation instruments appropriately – for example by making sure that the cap of its emissions trading scheme takes into account the other mitigation instruments, and where appropriate, also the altered framework conditions for supplying power.

18. Reductions in the power sector

With a combination of energy conservation, demand- and supply-side energy efficiency, and the use of renewable energy sources, Germany can reduce its greenhouse gas emissions from the power sector in accordance with the long-term mitigation requirements. This will require a structural change in the power sector and a suitable mix of instruments.

► Germany should work to ensure that the EU's Energy-using Products Directive specifies comprehensive ambitious energy-efficiency standards.

► Germany should continue to adapt its legislation on renewable sources of energy (EEG) with a four year cycle (report followed by amendments) in order to ensure the further development of renewables and their market integration.

► Germany should introduce measures to promote the extension of the power grid and to re-design the fossil-fuel fired power production in order to ensure the integration of regenerative power.

19. Reductions in the heating sector

With a reduced demand for the heating of buildings, a more efficient provision of thermal energy, as well as the increased use of renewables for heating purposes, Germany can significantly reduce its greenhouse gas emissions. In order to access this reduction potential of at least 17 million tonnes CO_2, further development of the mitigation instruments is necessary.

► The Federal Government should further amend the Energy Conservation Ordinance (EnEV) so that from 2015 the passive house standard is specified for new buildings and from 2018 refurbishments is carried out using passive house components.

► The Federal Government should continue the current programme providing public support for the refurbishment of existing buildings through 2020 and beyond.

20. Reductions in the transport sector

With a combination of behavioural change, alteration of the infrastructure, and technical measures, Germany can reduce greenhouse gas emissions caused by the transport sector. In addition to vehicle-specific reductions, the Federal Government must above all limit the rise in traffic volumes.

► Germany should insist that the EU implement a binding long-term vehicle emissions goal of 95 grams CO_2 per kilometre for 2020 with effective penalties for non-compliance and introduce ambitious directives regarding low rolling

resistance tyres and low-viscosity oils.

► In order to limit the rapidly increasing cargo related traffic on the roads, Germany should extend current motorway tolls to cover all commercial vehicles on all roads while at the same time expanding the rail network in an ambitious programme.

21. Reductions in agriculture and F-gas emissions

With the reduction of emissions of reactive nitrogen, the conservation of natural carbon sinks and with the expansion of organic farming, agriculture can contribute to reducing greenhouse gas emissions and to CO_2 fixation. There are already alternatives to the fluorinated compounds which are extremely potent greenhouse gases. In order to ensure the widespread use of the alternatives, existing regulations must be implemented rigorously, and tightened where necessary.

► Agriculture: Germany should adopt a strategy to reduce nitrogen emissions. Furthermore, the switch to organic farming should be supported in a way that ensures the demand for organic products can be covered largely by domestic production. In other words, organic agriculture should develop in accordance to the demand.

► Fluorinated greenhouse gases: In order to ensure that climate-friendly refrigerants are used in the series production of automobile air conditioning systems, Germany must support the EU Commission in meeting the deadline for the relevant directive.

22. Environmental communication as an instrument for mitigation

Ambitious mitigation is possible – but only as the result of numerous individual decisions. If people in all walks of life attach importance to climate change mitigation they will be able to achieve the potential for reducing greenhouse gases. It is necessary to establish public awareness towards mitigation and adaptation. Environmental communication is particularly important in this respect.

► In order to increase acceptance and to provide orientation, the Federal Government must improve the communication of its climate policies considerably and focus on key topics.

► In order to mobilise individuals to act, the Federal Government, the Laender, and municipal authorities should offer advice and information which is tailored to the specific situation of the individual actors.

23. Economics costs and benefits

Germany must implement ambitious mitigation measures – not least for economic reasons. Mitigation of climate change is an investment in the future. The large investments required must be weighed against the considerable savings in energy costs. When responding to the current economic crisis, the government stimulus packages must also provide impulses for a climate-friendly transformation of the economy.

►Net costs of mitigation in Germany are moderate and many mitigation

measures may even lead to net savings. In addition there are benefits of mitigation in the form of avoided consequential costs which would have been incurred, for example, due to climate change or air pollution. Germany should therefore make full use of the economic opportunities of ambitious mitigation in the various sectors of the economy.

24. Effects on growth and employment

A comprehensive and ambitious mitigation strategy strengthens the growth of the economy and creates jobs. Employment can be generated by measures for improving energy efficiency in buildings, companies, and the transport sector. Reducing greenhouse gas emissions by 40 % before 2020 will create some 630 000 jobs and ensure that the German economy has a strong position on the world market for climate mitigation goods. Adaptation measures can also generate positive effects on the labour market.

► Both Germany and the EU must provide reliable framework conditions for their climate policies so that companies will invest, create jobs, and strengthen their competitive position for mitigation and adaptation goods internationally.

Synergies and conflicts between climate policies and other goals of sustainable development

25. Climate change mitigation, human health and ecosystems

Climate change mitigation measures can additionally result in co-benefits for other protected public goods. The use of efficient power stations with low sulphur and nitrogen oxide emissions reduces the acidification and eutrophication of ecosystems. However, mitigation measures may also have negative impacts on other public goods. The increased use of biofuels can lead to higher emissions of air pollutants such as nitrogen oxides or particulate matter.

► A further reduction of greenhouse gas emissions will generally help to maintain human health and the protection of ecosystems, and also support the achievement of targets in air pollution abatement, in particular the reduction of nitrogen oxide emissions.

► It is important to ensure that mitigation measures do not have negative impacts on other public goods. This requires targeted measures to reduce such impacts. For example, emission limits should be tightened for small-scale combustion installations, and amendments introduced to the Ordinance on small- and medium-sized combustion installations in order to significantly reduce the emissions of wood-fired stoves.

► The Federal Government should increasingly target its support programmes towards promoting large-scale biomass-fuelled installations, because technologies for emission reductions can then be implemented more cost-effectively than for smaller units.

26. Using biomass and sustainable agriculture

The increased use of biomass as a fuel can be detrimental to ecosystems if the cultivation and use of energy crops is not sustainable. The cultivation of biomass for fuel, food and fodder, or industrial raw material competes for the available global land. But worldwide, more than 1 billion people are malnourished. In June 2008, Germany committed itself to an ambitious package of measures to tackle the causes of poverty and hunger worldwide. Key causes are the enormous consumption of resources in the industrialised countries and emerging economies as well as the associated destruction of the environment and nature and global population growth. In the future, biomass production must be more efficient and sustainable if it is to be capable of meeting the needs of a growing world population.

► Biomass production, in particular for bioenergy, must not lead to additional environmental impacts. Sustainability criteria for biofuels and bioliquids in general are contained in the EU Directive on the promotion of the use of energy from renewable sources (2009/28 EC). The Federal Government has transposed these into German law in two ordinances. At the end of 2009 the Commission will report on sustainability criteria for gaseous and solid biomass, and these should also be promptly anchored in German law in accordance with existing EU law. Compliance with the criteria must be ensured. The Federal Government should enter into bilateral and multilateral treaties for the sustainable production of bioenergy.

► In addition to the certification of globally-traded biomass for use as a fuel, the Federal Government should promote sustainability certification of biomass in Europe and in international bodies, for whatever uses, including animal fodder, food, or use as an industrial raw material.

►The Federal Government should play an active role in tackling poverty and hunger, contribute nationally to securing food availability with programmes for resource conservation and sustainable life-styles and consumption, and also stimulate the formation of international partnerships to develop a sustainable global land management system.

27. Climate change mitigation and resource conservation

Resource conservation in technical processes is often associated with an improvement in energy and greenhouse gas balances, and vice versa. There are considerable synergy potentials in relevant sectors of the economy, including the paper industry, construction industry and the waste management sector. Product design has a considerable influence on the environmental impact resulting from the employment of energy-using products. Approaches to product labelling must provide effective help in avoiding negative global effects on resources.

► Energy- and material-efficient production technologies should be promoted, in order to boost mitigation and resource conservation. Technical measures to increase energy efficiency and to reduce greenhouse gas emissions should be improved.

► Synergies between mitigation measures and resource conservation or

enhanced resource productivity should be achieved by harnessing the potential of resource conservation in the construction and waste management sectors.

► Conflicts between the objectives of climate policy and other objectives of the sustainable use of natural resources should be identified and prevented. The EU Directive for Energy-Using Products should be developed further, gearing towards a sustainable product design.

► The Federal Government should work within the European Union towards an international convention on sustainable resource management.

28. Climate change mitigation and adaptation policies within the context of other environmental policies

Climate policies should be framed at all political levels so that conflicts between mitigation and adaptation can be resolved in a transparent manner. This includes conflicts with other protected environmental goods, while at the same time harnessing possible synergies. In the opinion of the UBA it is important that potential conflicts are identified immediately. Therefore, decision-makers in law-making institutions, planning bodies and other official bodies at the national, federal state, regional and local levels should make full use of the available instruments for monitoring and reviewing. The Federal Government should also encourage further development of these instruments. It is also essential to integrate aspects of climate change mitigation and adaptation in other political fields. The goal of sustainable development must guide these activities.

► In the future, greater importance should be attached to environmental concerns in legislative procedures. The legislators should examine new legislation thoroughly at an early stage for the effects it will have on the environment, including the impact on the climate.

► The best possible use should be made of the Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) during the examination and implementation of plans and proposals in order to find the best possible solutions, especially concerning the effect which mitigation and adaptation measures will have on other environmental resources.

► Political decision-makers should systematically review and improve existing sectoral policies (i.e. agricultural policies) for possible synergies and potential contributions towards reaching climate objectives.

29. Developing the secure and sustainable provision of energy

Germany can establish itself as a leading global player by converting solely to renewable sources of energy, providing an example for the development of a secure and sustainable energy system. Such an approach would equally take into account factors such as mitigation, environmental conservation, and public health, as well as the secure provision of energy. In the long term there is no alternative to such a reorganisation of the energy system. In the opinion of the UBA, all decision makers have an obligation to further promote these on-going developments and to treat them as a priority in all economic, legislative and administrative decisions.

► The UBA recommends that the Federal Government, on the basis of existing measures, should develop an Energy Master Plan for the development of a sustainable energy system. This should be based on the extensive consideration of all criteria required in the concept for the development of a sustainable energy system.

► In the course of developing the Energy Master Plan, the Federal Government should initiate a public discussion process, regarding a sustainable energy system. Federal States, associations and various groups of actors should also contribute by setting their own objectives towards establishing a clear orientation for Germany and creating a global example. The UBA feels that all state and private decision-makers have an obligation to support the Federal Government in these efforts. The Federal Government should treat this consensus as a priority in all legislative and administrative decisions.

► The Federal Government has already given clear signals for the development of a sustainable energy system by introducing a variety of measures. In sections 17 to 22 above, numerous measures are cited for the continuation of this approach. In order to ensure a development in accordance with its Energy Master Plan, the Federal Government will in the future have to create legal, administrative and economic framework conditions, and support important sectors of research.