

The German Bishops

Commission for Society and Social Affairs

Commission for International Church Affairs

No. 29en

Climate Change: A Focal Point of Global, Intergenerational and Ecological Justice

An Expert Report on the
Challenge of Global Climate Change

With a Foreword by the
President of the German Bishops' Conference

September 2006

Climate Change: A Focal Point of Global, Intergenerational and Ecological Justice

An Expert Report on the
Challenge of Global Climate Change

With a Foreword by the
President of the German Bishops' Conference

2nd, updated edition, April 2007

September 2006

Climate Change: A Focal Point of Global, Intergenerational and Ecological Justice. An Expert Report on the Challenge of Global Climate Change. With a Foreword by the President of the German Bishops' Conference.

The German Bishops – Commission for Society and Social Affairs/Commission for International Church Affairs No. 29. Published by the Secretariat of the German Bishops' Conference. 2nd, updated edition, Bonn 2007.

CONTENT

Foreword	5
Authors	10
Climate Change: A Focal Point of Global, Intergenerational and Ecological Justice	
1. Climate Change and the Responsibility of the Church	11
2. Anthropogenic Climate Change and its Consequences	17
2.1 Natural and Anthropogenic Climate Change	17
2.2 Climate Change and its Consequences for Nature and Humankind	23
3. Criteria for a Christian Ethic of Sustainability	32
4. Opting to Protect the Climate in Solidarity with the Victims	41
4.1 The Need for a Global and Integrated Climate Policy	41
4.2 Mitigating the Causes of Climate Change	44
4.3 Adapting to the Consequences of Climate Change ..	55
4.4 The Witness of the Catholic Church in Germany	57
5. The Power of Our Faith	68

Foreword

Global climate change is already reality. People can literally feel its impact first hand through heat and drought, storms and heavy precipitation, glacial retreat and floods, crop failures and the spread of diseases. Global climate change probably represents the greatest existential threat for the present and, to a much greater extent, for coming generations, as well as for non-human nature. Consequently, the biological, social and spatial consequences are a serious challenge for humankind.

We must actively address this challenge. As those to whom God entrusted creation as a loan, we humans bear responsibility for its well-being. As Christians, we believe that God created Earth, as handed down in the Biblical story of creation: "God looked at everything he had made, and he found it very good." He commissioned us humans with cultivating and protecting the Garden of Eden. By inviting us to use its resources, God at the same time committed us to conserve and maintain creation.

"The climate is a good that must be protected," says the Compendium of the Social Doctrine of the Church. Only little time is allowed for this. Today, many tens of thousands of people already fall victim to climate change each year. The shortage of drinking water – a consequence of these changes – is developing into one of the prime causes of flight and military conflict.

The predominant scientific view is that global climate change is most likely an essentially anthropogenic process, which has already begun, and which, through its impact, threatens the existence of many human beings, fauna and flora species. We must take the findings produced by the relevant sciences very seriously indeed. Even if a substantial degree of uncertainty were to exist in respect of the reliability of the various future scenarios, the precept of caution would nevertheless demand that we take scientifically substantiated warnings seriously and change our behaviour patterns and actions. Irrespective of how much human action affects global climate change, we have to reduce greenhouse gas emissions and make adjustments to take account of the consequences. This is a dictate of precaution and responsibility, especially towards the weakest and to the coming generations.

The burdens of anthropogenic climate change are spread very unevenly. Both globally as well as in individual countries, it is often the poorest who are most affected. Poor countries have fewer options available to them for protecting themselves against rising sea levels. Drinking water is becoming a scarce and expensive good that the rich are more likely to be able to afford. And the same applies to measures aimed at counteracting storms, floods and droughts. At the same time, the poorer countries account for a much lesser amount of climate-damaging greenhouse gas emissions than the industrial nations do. These rich nations find it easier to adapt to the consequences of climate change. Hence, climate change is a problem of global justice.

Actions that damage the climate are not only short-term. They also play a medium to long-term role. Not only now but also in several decades will it be possible to notice that we have emitted large volumes of greenhouse gases into the atmosphere. Coming generations will be the victims of our present-day actions. This is why climate change is also a problem of intergenerational justice.

Climate change fundamentally changes the living conditions for non-human nature. Habitats and environments for plant and animal species are disappearing, which in turn reduces biological diversity on Earth. Hence, climate change is also a problem of justice for creation.

The statement at hand is based on the view that human action, on the one hand, and inaction, on the other, share responsibility for the changes to the climate and that global climate change represents a danger to humankind and to nature. Substantial efforts have to be taken to prevent action that damages the climate and to implement effective strategies for adapting to the consequences of climate change. Everybody must play their part in addressing the great human challenge of global climate change. The task that we face is indeed large, but it is not so large that we could not achieve anything by taking some actions and desisting from others. On the contrary: national and international politics bear just as much responsibility as do international organisations, development agencies, and business and industry. In the final analysis, each and every individual must

organise their personal lifestyle in such a way that it is climate-compatible and friendly.

Numerous political, economic, social and individual activities already exist today with the goal of encouraging more climate-compatible and friendly action. A large number of valuable initiatives and concrete measures that contribute to protecting the climate also exist within the Church, in its parishes and associations as well as in its institutions and agencies. This provides the bishops with an opportunity to thank all those who are playing their part here and who endeavour to spare and conserve the climate. Many paths are already being taken in this respect, for example, saving electricity and using renewable energies, changes in mobility patterns, and the introduction of environmental management systems. Further activities are urgently called for. We encourage such action.

I would like to express my sincere thanks to the Working Group on Ecological Issues that produced this report on behalf of the Commission for Society and Social Affairs and the Commission for International Church Affairs of the German Bishops' Conference. I would also like to thank all the other experts who contributed in many different ways to the consultative process.

In publishing this report in the series "The German Bishops", we aim to contribute to spreading knowledge and an understanding of the significance of climate change as a question of justice, and of the survival of humankind and of its fellow creatures, and, in particular, to introduce the concerns of the

poor, the weak and the disadvantaged into the public debate, because they are often not adequately considered. We call upon and encourage those in positions of responsibility within the Church, as well as those who hold responsibility in government and politics, in business and industry, and in society to take up effective measures to conserve the climate and to adapt to the consequences of global climate change. We all have an obligation to act – out of solidarity with the victims of climate change and with the future generations as well.

Bonn, September 2006

Karl Cardinal Lehmann
President of the German Bishops' Conference

Authors

Working Group on Ecological Issues of the Commission for Society and Social Affairs of the German Bishops' Conference

Prof. Dr. Karl Bopp, Benediktbeuern
Gotthard Dobmeier, München
Prof. Dr. Bernhard Irrgang, Dresden
Prof. Dr. Andreas Lienkamp, Berlin
Birgit Mock, Neuwied/Rhein
Cornelia Quennet-Thielen, Berlin
Dr. Willi Real, Dinklage
Prof. Dr. Ortwin Renn, Stuttgart
Prof. Dr. Josef Sayer, Aachen
Auxiliary Bishop Dr. Bernd Uhl (Chairman)
Prof. Dr. Paul Velsing, Dortmund
Prof. Dr. Markus Vogt, Benediktbeuern
Thomas Wallenhorst (Coordinator), Bonn
Robert Wessels, Berlin

We are grateful to Dr. Ottmar Edenhofer, Potsdam, Prof. Dr. Wolfgang Haber, Freising, Dr. Hans-Jochen Luhmann, Wuppertal, Prof. Dr. Stefan Rahmstorf, Potsdam, Prof. Dr. Christian-D. Schönwiese, Frankfurt/Main, and Matthias Seiche, Bonn, for their comments and advice.

Climate Change: A Focal Point of Global, Intergenerational and Ecological Justice

I. Climate Change and the Responsibility of the Church

(1) Climate change currently represents probably the greatest existential threat for present and future generations as well as for non-human nature. Consequently, it presents a serious challenge to the responsibility for creation. How humans interfere with the climate system, with global impact, and how this in turn affects the biological, social and spatial existential basis is becoming ever more apparent.

(2) Just a few decades ago, anthropogenic global climate change, i.e. that caused by human activity, was considered a possible event in the distant future. Today, it must be understood as a process that has already begun and is extensively changing the living conditions on Earth. Hence, protecting the climate is a task that must not be delayed, so that decent living conditions and the natural ecosystems can be globally and sustainably secured. Two kinds of strategies are needed to mitigate the negative consequences for humans, fauna and flora: those to reduce greenhouse gas emissions, seen as the prime cause of anthropogenic climate change, and those to take adaptation measures.

(3) Time is pressing. According to a study by the World Health Organisation, anthropogenic climate change claimed more than 150,000 lives in 2000 alone, through heat stress, flooding and the spread of diseases. The material damage

caused worldwide in 2002 alone is estimated to stand at 55 billion US dollars. Estimates by the insurance industry expect that this could multiply within just a few years, and could increase elevenfold to more than 600 billion euros per year by 2050. The bottlenecks caused by climate change – in particular in respect of access to clean drinking water – bear extensive potential for social and military conflict. Some 500 million people already live in countries with drinking water shortages today; by 2025, this could apply to three billion people. Health, prosperity and security cannot be guaranteed long term without drastic, globally coordinated climate protection measures.

(4) The burdens of anthropogenic climate change are spread very unevenly. The poorest are affected most by this change, both globally as well as within individual countries. The poor countries of the South, particularly, which only contribute very marginally to the causes, have difficulties adapting to the changes. The industrial nations, by contrast, which are essentially responsible for the emission of climate-damaging greenhouse gases, are much more able to protect themselves against the consequences. This great inequality between polluters and victims makes anthropogenic climate change into a fundamental problem of global justice. Indeed, there is also a time dimension to this inequality. Our failure to protect the climate today will above all develop its negative effects in the future, since the greenhouse gas carbon dioxide (CO₂), in particular, remains in the atmosphere for several decades as a result of which its negative impact is time-delayed. This in turn calls the principle of intergenerational justice into question. Beyond the interests of the poor and of coming generations, climate change eventually fundamentally affects the habitats of fauna and flora as well and so impacts the relationship between humans and their fellow creatures. Therefore, anthropogenic climate change is a

question of justice at three levels: global, intergenerational and ecological.

(5) In view of the ethical implications and of the danger of violating Christian and basic human values, climate change is one of those questions on which we, as the Church, must not remain silent. We are called upon to state our position and to act accordingly. For, according to the Second Vatican Council, concern for the fact that "human society deserves to be renewed" (*Gaudium et Spes* 3) is part of the mission of the Church. "To carry out such a task, the Church has always had the duty of scrutinising the signs of the times and of interpreting them in the light of the Gospel" (*Gaudium et Spes* 4). As a comprehensive challenge to the responsibility for creation, to justice and solidarity with the poor, the weak and the disadvantaged, climate change is just such a sign of the times that does not leave faith in God as the Creator and Redeemer unaffected. The Catholic sphere has so far produced only a few differentiated statements on climate change.¹ The text at hand aims to help to fill this gap.

(6) The decisive benchmarks for the Church's responsibility and for pastoral action are not primarily delivered by social- or natural-scientific plausibilities, but rather by the promises contained in Jesus' Kingdom of God message. One of the core statements in this message lies in the fact that final, complete

¹ A collection of statements on the topic of "Climate Change" from the ranks of the Catholic Church is contained in *European Christian Environmental Network* (ed.): *Climate Change – A Challenge to the Churches in Europe*, Brussels 2003, <http://www.ecen.org/oldsite/climecon.shtml>. Cf. also *United States Conference of Catholic Bishops: Global Climate Change: A Plea for Dialogue, Prudence, and the Common Good*, Washington, D. C. 2001, <http://www.nccbuscc.org/sdwp/international/globalclimate.htm> and *Catholic Earthcare Australia: Climate Change. Our Responsibility to Sustain God's Earth*, 2005.

and universal justice is realised at the end of time by God Himself. In this world, divine justice stands as the promised and humanly unavailable future and, simultaneously, as the standard for human action to realise as much of this as possible, here and now.

(7) The Kingdom of God message that builds on God's universal will to save all people (cf. 1 Tim 2,4) and the whole of creation (cf. Rom 8,21 f.) forms the Church's theological basis for creating a just society and a just relationship with non-human nature. This message contains no panaceas for solving the problems of global climate change, but does create the horizon for the Church's historical action that lives on hope for the Kingdom of God. Those who profess to faith in the Biblical God must never be indifferent towards injustice and must include all people as well as animate and inanimate nature in their solidarity and responsibility.

(8) In this respect, the Church sees itself as a "universal sacrament of salvation" (cf. Lumen Gentium 48), namely "as a sign and instrument both of a very closely knit union with God and of the unity of the whole human race" (Lumen Gentium 1). In its capacity as a visible and effective sign, it seeks to represent the invisible God and His saving will in this world – and so create unity and solidarity among all people in the spirit of God and to promote a new relationship with creation.

(9) The Church depends on its discourse with research and society for its contribution to climate protection. It shares responsibility for changing social values towards global justice, towards the long-term preservation of living conditions and towards new ecological wealth models. Without such change, no technical solutions or political negotiations to protect the climate would achieve their goals. The Church is challenged to defend the social, natural and moral principles of a free, democratic and future-viable state as part of the international community and to

introduce the liberating force of the Christian faith into the socio-political dialogue. The prime aspects of this are that the Church

- sees its role as an advocate of the basic ethical options of Christian responsibility for creation which aims to preserve Planet Earth as a future-viable "house of life" for all creatures;
- represents a concept of humankind that is based on the equal dignity of all people as the children of God, regardless of their characteristics or skills or abilities, and that demands decent living conditions for all, including future generations;
- demands an attitude of global solidarity, whereby the Church, in its capacity as the Universal Church, itself knows that it is dedicated to a decisive commitment for the poor and the excluded, in particular;
- aims for a willingness to change views and opinions and to act to preserve creation and to give it a humane and environmentally compatible structure, not only on the part of politicians and leading figures, but also of all people as well;
- stands for long-term thinking that, building on hope of the future guaranteed by God – "the Kingdom of God and its Justice" –, draws the power to persistently follow the long and difficult path to intergenerational justice;
- lives from a spirituality that enables it to venture upon new paths of experienced responsibility for creation together with all people of good will and to oppose all resistance to achieve the necessary change with peaceful means.

(10) In its structure, the text at hand follows the triad "See – Decide – Act". Initially, it looks back at the findings and future projections of climate research to depict the current situation and its prospective development. And then assesses climate change and its consequences from the global and long-term perspective of the Christian ethic of sustainability. Finally, it presents examples of some possible action prospects for an integrated policy of sustainable climate protection. A particular focus is placed on the opportunities for Church co-responsibility. Because, the Christian witness not only includes ethical reflection, but also and equally the solidary commitment for justice by practising climate protection.

(11) This means that before any ethical assessment and considerations of possible actions can be used, the first step is to gain the clearest possible and objective perception and analysis of the facts and of the future scenarios derived from this. Even this is in itself a highly demanding task, especially since the Church does not have its own sources of knowledge available to it, when describing and explaining climate change, its causes and consequences. Rather, it is dependent on the expertise of the relevant sciences, whose findings it must accept with an open mind and without inappropriate simplification. Angst-ridden exaggerations must be avoided as must the suppression of unpleasant truths. The belief in creation will above all initially prove itself here by seriously considering the empirical findings and by giving the situation the most balanced and comprehensive examination possible. This means that many different kinds of resistance will have to be overcome in respect of the problem of climate change, because this is one of those unpleasant truths that we like to suppress, that we "hear but do not listen or understand" (Mt 13,13).

2. Anthropogenic Climate Change and its Consequences

2.1 Natural and Anthropogenic Climate Change

(12) Climate change is not about the current or local weather and how it fluctuates. Nor is it about atmospheric conditions in the sense of average weather conditions over a few days or weeks. Rather, climate is about "the entirety of weather conditions over a long period of time, including any extremes that may occur".² This includes temperature, precipitations, winds and cloud formations recorded for and described in statistics. Observations generally extend here over a period of at least 30 years.³ The climate is a highly complex system that not only includes the atmosphere itself, but also and beyond this, the hydrosphere (fresh and salt water), cryosphere (snow, ice and permafrost), the land surface and biosphere as well as how all these interact with each other.

(13) This system is by no means static. Rather, it changes over the course of time, influenced by its own inner dynamics and by external factors. These external influences include, on the one hand, natural factors like volcanic eruptions (and their associ-

² Grassl, Hartmut: Art. Klimaveränderung, 1. Zum Problemstand, in: Lexikon der Bioethik, Vol. 2, Gütersloh 1998, 392–396, here 392.

³ Cf. Schönwiese, Christian-Dietrich: Art. Klima, in: Lexikon der Geowissenschaften, Vol. 3, Heidelberg-Berlin 2001, 117.

ated cooling effect) and fluctuations in the intensity of solar radiation (depending on the sun's activity and, in the very long term, also on the terrestrial orbit cycles) on which humankind has no influence. On the other hand, man-made (anthropogenic) factors of influence also exist, such as changes in the composition of the atmosphere caused by greenhouse gases and particles as well as the effects of urban development and changes in land usage.

(14) Greenhouse gases allow the energy rich (relatively short wave) solar radiation to pass through to the earth surface practically unhindered. To a certain extent, they also absorb some of the (relatively long wave) radiation emitted by the heated Earth. The greenhouse gases radiate the absorbed energy in all directions in the form of infrared radiation, which means that a substantial part of this radiation is also reflected back to the earth surface. Without this natural greenhouse effect, the global mean near-surface air temperature would be around 33°C lower than the actual value of 15°C, i.e. at a cold -18°C. This means that the naturally present gases – water vapour (which, with a 60% share, is the main factor in the natural greenhouse effect), carbon dioxide, methane, nitrous oxide, ozone – and a number of other gases form a kind of partly permeable "gas roof" that allows solar radiation to pass through but simultaneously slows down the emission of the earth surface's infrared radiation and prevents the Earth from cooling down.⁴ This occurs completely independently of human factors.

(15) To this, however, comes the anthropogenic factor. In the Climate Convention of 1992, the nations of the world already voiced their concerns "that human activities have been substantially increasing the atmospheric concentrations of greenhouse

⁴ Cf. *Grassl, Hartmut*: Art. Treibhauseffekt, in: *Lexikon der Bioethik*, Vol. 3, Gütersloh 1998, 606–608, here 607.

gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth's surface and atmosphere and may adversely affect natural ecosystems and humankind".⁵ By the time the Intergovernmental Panel on Climate Change (IPCC) published its report in 2007, the former concern had turned into a strong certainty: "Most of the observed increase in globally averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations."⁶ Indirectly acquired (e.g. via ice bores) measurement data on long periods of time plus a wide range of various computational models showed that the global warming measured since industrialisation is greater than that measured over 10,000 years, i.e. since the end of the last ice age. It is proceeding astonishingly quickly and is in all probability caused by anthropogenic factors, namely and in particular, by the additional emission of greenhouse gases, with CO₂ playing the major role.⁷

⁵ United Nations Framework Convention on Climate Change, Preamble and Art. 2, <http://unfccc.int/resource/docs/convkp/conveng.pdf>. The Climate Convention came into force in 1994.

⁶ Cf. *International Panel on Climate Change: Climate Change 2007: The Physical Science Basis. Summary for Policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Paris 2007*, <http://www.ipcc.ch/SPM2feb07.pdf>, 10 ("very likely" means 90 to 95% probability of occurrence; cf. *ibid.* 4).

⁷ At present, some 32.3 billion tonnes of CO₂ are emitted into the atmosphere every year (equal to around 8.8 billion tonnes of carbon units), of which some 80% are produced by using fossil energies and just fewer than 20% are due to forest clearing. Around half of this is stored by the oceans. The sink potential can be increased by a net increase in the amount of woodland, though only to a limited extent. Because it only works if enough groundwater is available. Even absorption by the oceans is limited: With increasing atmospheric CO₂ concentrations, the

(16) In this respect and also in the following comments, the text above all follows the largely accepted results and assumptions of the IPCC. Their findings are largely accepted by the sciences, although some few critical voices can also be heard. However, all researchers, including the "sceptics", agree that, since the beginning of industrialisation, humankind has increased by one third the concentration of greenhouse gases in the atmosphere, especially CO₂, through greenhouse gas emissions and the destruction of carbon reservoirs (above all, forests). It is also undisputed that a higher concentration of greenhouse gases leads to higher temperatures for the above presented reasons, if all other factors remain the same. Thirdly, there is also agreement on the fact that, with 95% certainty, the increase in the global temperature over the past 50 years *cannot* be explained by natural fluctuations. However, some scientists – usually no climatologists – are of the opinion that the observed warming cannot with absolute certainty be attributed to human activities and that rather natural processes could be playing a greater role here.

(17) However, the great majority of researchers assume there to be a direct correlation between anthropogenic emissions (and changes in land usage) and the climate, which is also influenced by a number of natural factors and, what is more, in both directions. Looking back at the past 50 years, however, much seems to indicate that the natural factors of influence tend to alleviate the anthropogenic effect. There is still some uncertainty as to

proportion of anthropogenic CO₂ emissions taken up by the oceans decreases. In addition, warmer water tends to release CO₂ rather than absorb it. Furthermore, recent studies also point to an acidification of the oceans caused by increasing CO₂ input, possibly with serious consequences for the marine ecosystems and the food chain. Cf. *German Advisory Council on Global Change (WBGU): The Future Oceans – Warming Up, Rising High, Turning Sour*. Special Report, Berlin 2006, 69 ff., http://www.wbgu.de/wbgu_sn2006_en.pdf.

the regional distribution of climate change resulting from the increase in global temperature. However, regional climate models have also become more valid and reliable.

(18) This brief outline of the current state of knowledge shows that the theory of climate change is more than just credible speculation by a few individual scientists. Rather, this theory can be taken to have been confirmed with a certainty of more than 95%. Only the exact shares of anthropogenic and natural factors are still a matter of dispute. Yet, even if one were to assume that nature played the major role in causing climate change, this would in no way change the need to at least limit the anthropogenic causes in order to reduce the negative consequences. And, completely irrespective of whether nature or humankind is to be seen as the main cause, adaptation measures are still needed. To this extent, references to the remaining uncertainties and to differing views in science cannot be used to justify a policy of simply "waiting and seeing" or even of postponing measures to protect the climate. Furthermore, most greenhouse gases remain in the atmosphere for a long time until they – as far as still possible – are absorbed by oceans or vegetation or diffuse. This means, each and every carbon dioxide molecule that we emit today and that is not permanently taken away from the atmosphere will influence the future climate. Waiting and seeing until the temperature increase has reached no longer tolerable levels would therefore be irresponsible. We must take precautions by making provisions and planning ahead.

(19) Besides carbon dioxide (CO₂) with its estimated share of 61%, other main causes of the additional anthropogenic greenhouse effect are methane (CH₄) with 15% and chlorofluorocarbons (CFCs) with an 11% share. Carbon dioxide is produced in particular by using fossil energies such as coal, oil or natural gas (75%) or as a result of forest clearing or forest fires (20%).

Methane is also a product of fossil energies (27%), as well as of intensive livestock farming (23%), rice growing (17%), wastes (16%), biomass combustion (11%) and animal excrements (6%),⁸ while the melting of permafrost areas caused by climate change also releases large volumes of stored methane. CFCs are used as propellants in aerosols, in refrigeration engineering, as insulating material and in dry cleaning and are, in contrast to carbon dioxide and methane, purely man-made. This means that the main causes of the anthropogenic greenhouse effect are the burning of fossil energy sources to generate electricity and heat, the strong increase in motorised transport, especially air travel, as well as industry, farming and domestic households.

(20) Industrial and emerging nations are responsible for 90% of the increase in worldwide CO₂ emissions seen since 1960. At present, the 10 main polluters are the United States, China, Russia, Japan, India, Germany, Canada, Britain, South Korea and Italy.⁹ Their continuing increase in greenhouse gas emissions and the energy intensive industrialisation processes, particularly in the populous emerging economies of Asia and Latin America, mean that no stabilisation let alone reductions in the emissions or concentrations at global level are in sight yet, despite some individual countries and sectors succeeding in achieving reductions. On the contrary, the expected continuing growth of the world's population and the rising demand for energy per capita will aggravate the problem as a result of the increasing consumption of coal and other fossil energies – above all in China and India.

⁸ Cf. *Schönwiese, Christian-Dietrich: Klimatologie*, Stuttgart 2003, 333–344.

⁹ In descending order by their proportion of worldwide energy-induced CO₂ emissions and based on absolute values rather than on population or gross domestic product.

2.2 Climate Change and its Consequences for Nature and Humankind

(21) *Global warming*: The anthropogenic increase in greenhouse gas concentrations consequently intensifies the natural greenhouse effect and leads to higher average global earth surface temperatures and so to warmer land surfaces and oceans – with an uneven distribution, meaning with substantial regional and also seasonal differences. As oceans become warmer, they release more CO₂. Then, higher CO₂ values in the atmosphere lead to further warming. While the natural greenhouse effect is vital, its intensification as a result of human activity is a matter of concern. "The change in one climate factor ... can lead to far-reaching and rapid changes in the whole climate system as a result of a wide range of complex interactions. Since the ecosystems and also our civilisation are adapted to the present climate conditions, such changes can have threatening consequences."¹⁰ Projections using the SRES emissions scenarios in a range of climate models result in an increase in globally averaged surface temperatures of 1.1°C to 6.4°C over the period 1980 to 2100.¹¹ The German Advisory Council on Global Change (WBGU) sees even a warming of 2°C compared with pre-industrial values or an increase by more than 0.2°C per decade as a dangerous development.¹² The IPCC has shown that

¹⁰ *Umweltbundesamt*: Nationaler Inventarbericht 2005. Berichterstattung unter der Klimarahmenkonvention der Vereinten Nationen, Berlin 2005, 9, <http://www.umweltdaten.de/publikationen/fpdf-l/2931.pdf>.

¹¹ Cf. *IPCC WG I* (note 6), 13.

¹² Cf. *German Advisory Council on Global Change (WBGU)*: Climate Protection Strategies for the 21st Century: Kyoto and beyond. Special Report, Berlin 2003, 9, http://www.wbgu.de/wbgu_sn2003_engl.pdf.

the risk of dangerous interference with the climate system will increase strongly beyond the 2°C ceiling. Since the global mean temperature has already risen by 0.74°C in the past hundred years (and a further increase by 0.6°C by 2100 is hardly inevitable even if the greenhouse gas concentrations stabilized), only another few tenths of degrees remain before we cross this important threshold. However, negative effects can already be expected to appear before this. Why this is the case will be explained in the following.

(22) *Shrinking Arctic and Antarctic ice cover, glacial retreat, and melting permafrost areas:* The Arctic ice cover has lost around 40% of its thickness as a result of the warming of the past 30 years. Over the same period, its surface area has shrunk by 2.7% per decade, during the summer months even by 7.4% per decade. This means, that this habitat may entirely vanish during the summer months by the end of this century. Furthermore, substantial losses of mass from non-polar glaciers and shrinking snow covers have also been observed all around the world. On the one hand, these are consequences of the warming while, on the other, the decreased ice surface is itself a cause of rising temperatures. Because the dark oceans, and indeed dark areas in general, reflect the sunlight much less than do bright snow and ice surfaces. Moreover, glacial retreat and shrinking snow covers are a threat to the fresh water supply of more than one sixth of the world population. Mountainous regions are threatened by rock avalanches and floods caused by growing glacier lakes. In addition, the enormous permafrost areas, which cover almost one quarter of the Earth's land surface, are melting to ever greater depths. This does not only cause substantial damage to infrastructure but could also result in a leap in methane levels in the atmosphere and so lead to additional warming of "greenhouse" Earth.

(23) *Rising sea levels:* The 20th century already saw the sea level rise by 17 cm on average, with the rate of increase accelerating towards the end of the century. This is caused by the thermal expansion of the oceans, as well as by the melting of land ice. The sea level is expected to rise by 18 cm to 59 cm from 1980 to 2100 (depending on the scenario); accelerated ice flow from land ice may lead to a further increase by 10 cm, 20 cm or even more.¹³ People living in small island countries and in countries with low-lying coastal areas are already threatened by flooding now. Around three billion people live in a 200 km-wide strip along the coasts in which human settlements and farmland will be largely lost, which will, in turn, trigger substantial migratory movements. The greatest increase in the sea level, caused by warming that has already taken place, still awaits us. This means that even if humankind should succeed in stabilising the greenhouse gas concentrations, sea levels would continue to rise for centuries to come on account of the enormous thermal inertia of the oceans. Since the regional warming over Greenland will be around one to three times as high as the global average, the island can expect to become around 5.5°C warmer by 2100. If this warming continues for another thousand years, it is very likely that sea levels will rise by several metres due to this factor alone.

(24) *Changes in ocean currents:* Melting land ice and greater precipitations could result in so much fresh water flowing into the North Atlantic Ocean that the resulting changes in the density of the ocean water could, in the long run, slow down or even stop the Gulf Stream and, particularly, its offshoot, the North Atlantic Drift, which is so important for Europe. If it were to come to a standstill, it would result in a noticeable cooling in the North Atlantic region and adjacent land areas,

¹³ Cf. *IPCC WG I* (note 6), 13–15.

including Northern and North Western Europe. IPCC estimates the probability of occurrence at up to 10% over the next 50 to 100 years. This scenario is even more likely after the next turn of the century if the temperature increase has not already been clearly reduced in this century. In the course of recent Earth history, the North Atlantic Drift has already missed a beat on several occasions. In such a case, the sea level would rise by up to another metre in Northern Europe due to a change of ocean currents. Fishing would be affected. Furthermore, the tropical rain belt could shift with the result that the present form of tropical farming would no longer be climatically appropriate. Despite the global warming trend, a small ice age would occur in Europe with consequences that would be no less catastrophic than the dramatic warming.

(25) *More extreme weather events:* Rapid climate changes also increase the probability of extreme weather situations; this means that we have to reckon with more intensive and frequent extreme events, such as storms, floods and hot spells. Whether individual events like the Caribbean hurricanes "Rita" and "Katrina" (2005) are a result of climate change cannot be answered with certainty by scientific research. However, the increase in particularly violent Category 4 and 5 hurricanes by more than 50% since the 1970s is only difficult to explain without climate change. It is equally difficult to explain how between 1993 and 2002 the number of major weather and climate-induced natural disasters (excluding earthquakes) increased by a factor of more than 3.5 compared with the 1960s. It is also statistically certain that the affected zones have to reckon with stronger and more frequent extreme events. The ferocity of the events in the last two decades is striking. In our latitudes, for example, we can look back on heavy precipitations in the winters of 1993/1994 and 1994/1995 that led to "floods of the century" in the Rhine region plus the extreme summer rainfalls in

2002 and 2005 that triggered catastrophic floods in the Elbe region (2002) and the northern Alps (2005), or the heat wave of the summer of 2003 in large parts of Europe with the resulting deaths, droughts and forest fires. Warming must make us fear a further pronounced increase in the number of extreme events in the future. This will above all affect the great majority of the world population living in developing countries. People in these countries are not the main causes of this problem and at the same time only have few resources available to them for protecting themselves against the impact of climate change. And indeed, even the industrial nations will not be spared from this impact. For example, estimates produced by the Washington Earth Policy Institute reckon that at least 35,000 people died of heat-related causes during the extraordinarily hot summer of 2003, especially in conurbations, where such heat waves were actually further intensified by, once again anthropogenic, so-called urban heat islands.¹⁴ The summer of 2003 was by far the hottest recorded in Germany since 1761, especially in August. While in Switzerland it was probably even the hottest for 500 years. Climate experts expect such hot summers to appear more often and more intensively in the future, and especially as a result of the anthropogenic greenhouse effect.

(26) *More floods:* The flood risk in many settled areas will increase, above all as a result of an ever-increasing incidence of strong precipitations, as well as due to rising sea levels. Many millions of people will be affected, particularly in the densely populated mega deltas of Africa and Asia as well as on small islands.¹⁵ Floods will cause massive increases in the number of

¹⁴ Such heat islands not only develop as a result of narrow streets or the quantity of people, but also by sealing surfaces and by the heat produced by ventilators, air-conditioners and lighting.

¹⁵ Cf. *International Panel on Climate Change: Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability, Summary for*

environmental refugees from near-coast areas. It is clear that rich nations, such as the Netherlands, will be able to protect themselves better against the looming dangers by running complex coastal protection programmes than poorer countries like Bangladesh can afford. And so the climate and poverty problem will merge in disastrous manner in the form of increasing floods and resulting migratory movements.

(27) *Less biodiversity*: If a habitat with certain climate characteristics completely disappears from Earth and the next still acceptable environment is unreachable, or if immigrant species deprive the indigenous species of their living conditions, this seriously impacts biological diversity and so also large sections of humankind. Nature's ability to adapt to climatic change depends on the speed of that change. Fast and sudden events lead to the extinction of many species, while slow processes can largely be cushioned by adaptation processes. On the geological and evolutionary timescale, however, the current climate change is a fast and even sudden event to which natural adaptation processes cannot respond quickly enough. So a massive depletion of fauna and flora must be expected, which will also affect the production of food.

(28) *Food security at risk*: Climate change will lead to extensive harvest losses due to droughts, storms and floods as well as possibly benefiting pests or competing wild plants. Even a small local temperature increase by 1–2°C would probably lead to a reduction in harvest yields at low latitudes, especially in tropical and seasonally arid areas. An increase by more than 3°C may reduce harvest yields also in some mid and high latitude regions

and at a worldwide scale.¹⁶ Overcoming climate-induced harvest losses and adapting animal husbandry would involve costs that not all countries or farms can afford. In some parts of Earth, climate change will substantially affect food security. Although other areas will be added – especially in Eurasia and North America – that did not or only marginally engage in farming, this will far from compensate for the predicted worldwide losses. In addition, the warming of the climate will result in parasites migrating from the south to the north or from lower to higher regions, where they will cause substantial harvest losses.

(29) *More diseases:* The IPCC and WHO predict that a growing number of people will be exposed to vector-transmitted diseases¹⁷ (e.g. malaria, Dengue fever, yellow fever and various kinds of meningitis) and water-dependent diseases (e.g. cholera), and that deaths from heat stress will also increase. Climate changes will result in a number of serious diseases appearing more frequently and spreading faster.¹⁸ However, the greatest impact that climate change will have on human health is the collapse of ecosystems. Well-ordered ecosystems perform a generally underestimated service for humans by keeping the organisms that are harmful to this system under control. The loss of this "service function" will advance the growth of adaptable populations and so will lead to the spread of diseases and epidemics. Adequate preventative strategies on the (environmentally harmless) containment of vectors and carriers, public information and vaccination are not feasible in most of the world. And many states can neither

¹⁶ Cf. *IPCC WG II* (note 15), 8.

¹⁷ A "vector" is understood as an organism, such as an insect, that transmits a pathogen from one host to another.

¹⁸ Cf. *World Health Organisation: Climate change and human health. Risks and responses. Summary*, Geneva 2003, esp. Ch. 5: Health impacts of climate extremes.

afford even the existing vaccines and drugs for humans and animals nor deliver them to the recipients.

(30) *More war and flight*: Although forecasts are difficult, studies predict that climate change will result in 150 million refugees in 2050.¹⁹ "Changes in the earth's atmosphere will influence our climate and have unforeseeable consequences. Certain forms of agriculture in the 'Third World' are leading to increased desertification, sometimes forcing the local population to abandon their traditional living spaces. Special attention must be paid to water supply. Experts are worried that water, not oil, could be the cause of future conflicts."²⁰ According to a forecast produced by the United Nations, two thirds of humankind will suffer from water shortages in 2025, with climate change being the prime cause.²¹ On their flight from drought, famine or floods, people will also increasingly find themselves living under unhygienic conditions, thereby benefiting the outbreak of epidemics.

(31) *Greater monetary costs*: According to the Stern Review, the long-term annual costs are estimated at the equivalent of 5% to 20% (or more) of the world GDP, i.e. the worldwide goods and services produced per year (depending on the scenario), compared to 1% for measures to prevent the most serious impacts of climate

¹⁹ Cf. *World Council of Churches (WCC) – Justice, Peace and Creation: Solidarity with Victims of Climate Change. Reflections on the World Council of Churches' Response to Climate Change*, Geneva 2002, 9, plus *Biermann, Frank: Umweltflüchtlinge. Ursachen und Lösungsansätze*, in: *Aus Politik und Zeitgeschichte. Beilage zur Wochenzeitung Das Parlament*, B 12/2001, 24–29, here 26 and 28.

²⁰ *The German Bishops: A Just Peace* (The German Bishops 66, publ. by the Secretariat of the German Bishops' Conference), Bonn 2000, No. 96.

²¹ Cf. *Schellnhuber, Hans Joachim/Cramer, Wolfgang/Nakicenovic, Nebojsa/Wigley, Tom/Yohe, Gary: Avoiding Dangerous Climate Change*. Cambridge University Press 2006.

change.²² Economically important industries like building, energy, agriculture or tourism are particularly dependent on the climate and so are "vulnerable". The countries of the South are disproportionately affected and are economically less able to counterbalance the damage. This once again shows that climate change is a decisive focal point of global, intergenerational and ecological justice in the early 21st century.

²² Cf. *Stern, Nicholas: Stern Review on the Economics of Climate Change*, 2006, iv, http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm.

3. Criteria for a Christian Ethic of Sustainability

(32) In the joint statement "For a Future Founded on Solidarity and Justice" (ZSG, 1997)²³ and the document "Handeln für die Zukunft der Schöpfung" (HZZ, 1998)²⁴, the Catholic Church in Germany stated its commitment to the principle of *sustainability*. This means that it stands up for development that is simultaneously socially fair, economically efficient and permanently environmentally compatible. However, the realisation of this three-way goal has been massively called into question as a result of the rapid pace of anthropogenic climate change, the most extensive human intervention to date into the complex interactions and processes taking place in the biosphere and so making a long-term impact on the living conditions on Earth.

(33) Climate change, which already has grave negative social, economic and ecological consequences now and will have all the more so in the coming years and decades (cf. HZZ 15), therefore also presents one of the central challenges of the 21st century for the Church, for the Christian faith and its theological-ethical reflection. "The climate is a good that must be pro-

²³ *Church Office of the Evangelical Church in Germany/Secretariat of the German Bishops' Conference* (eds.): For a Future Founded on Solidarity and Justice (ZSG). A Statement of the Evangelical Church in Germany and the German Bishops' Conference on the Economic and Social Situation in Germany (Joint Statements No. 9), Hannover, Bonn 1997.

²⁴ *The German Bishops – Commission for Society and Social Affairs: Handeln für die Zukunft der Schöpfung* (HZZ) (Statements by the Commissions 19, publ. by Secretariat of the German Bishops' Conference), Bonn 1998.

tected," states the Compendium of the Social Doctrine of the Church.²⁵ Because this is about no less than the threat to the essential living conditions of the present and coming generations as well as of countless animals and plants. This is why – contrary to all trends towards group-egoistic, nation-state and short-term perspectives – the *outlook* must be both *global* and *long-term* at one and the same time (cf. HZS 107 f.).

(34) The fact that climate change is advancing quicker than the growth of ecological awareness, than the scientific-technological ability to master the situation, and, in particular, than the political will to effectively counteract these developments is proving to be particularly problematical. The ecological awareness, in particular, apparently seems to be subject to cycles in our society and currently seems to be on the retreat. Climate change clearly shows that we are living and operating with an enormous mortgage on the future. A fundamental *re-orientation* in terms of the opportunities and priorities for a sustainable, future- and climate-compatible development is needed.

(35) The normative key criteria from a Christian perspective are *the dignity of the human being* as the image of God (cf. HZS 63, 73, 80 f., 90, 129) and the (graded) *intrinsic value of creation* (cf. HZS 53, 59, 85, 88 ff., 138). Building on these two fundamental yet threatened values, Christians must hold all fellow humans and fellow creatures in high regard and be willing to engage actively in responsibility and solidarity (cf. HZS 65). Protecting the climate is a new, complex and increasingly important test for this attitude.

²⁵ *Pontifical Council for Justice and Peace: Compendium of the Social Doctrine of the Church*, http://www.vatican.va/roman_curia/pontifical_councils/justpeace/documents/rc_pc_justpeace_doc_20060526_compendio-dott-soc_en.html, No. 470.

(36) In line with these key criteria, the Christian ethic chooses an *anthroporelational* (cf. HZS 84, 87 f.) and *responsible-ethical* approach (cf. HZS 91 ff.). On the one hand, this includes the certainty that humans do not exist in isolation, but rather in relation with their fellow creatures and, on the other, the conviction that humans have a particular role to play, being capable of and therefore compelled to take on responsibility for the consequences of their environmentally harmful action. The particular aspect of human dignity lies essentially in the fact that the human being is accountable in all respects to God, to his or her conscience and towards society and the community for his or her action and inaction. Since creation is a value in itself, human responsibility also extends to the shared natural world which humans must not use only as a means for achieving their objectives and purposes (the extended categorical imperative; cf. HZS 83, 86).

(37) Recognition of the dignity, freedom and rights of all people and *respect for life*, including non-human life (cf. HZS 53, 90, 121) encourages a practice that acts through *consolidarity* and *prosolidarity*²⁶ towards the realisation of rights and justice and towards *preserving* the threatened life contexts of *creation* (cf. HZS 84, 106, 114, 121, 136). On account of its extensive and long-term impact, climate change is a central focus of responsibility for creation.

(38) On the one hand, *justice* stands for the individual and collective philosophy (virtue) of wanting to act justly, and, on the other, the capacity of social systems to facilitate and promote a

²⁶ Solidarity in the sense of standing up for justice has two sides to it: a *joint* claim for their rights by the people affected (consolidarity) and advocational support by those not directly affected *for* people who are not or no longer able to claim the justice they have been deprived of (prosolidarity). Cf. *Mieth, Dietmar: Moral und Erfahrung, Vol. 2: Entfaltung einer theologisch-ethischen Hermeutik, Freiburg-Fribourg, 1998, 179.*

fair and socially balanced distribution of goods, opportunities and rights. On account of worldwide networking and the long-term effect of technological-economic action, justice today has a global and intergenerational dimension. A key orientation aid in this respect can also be provided by the Christian conviction of the original *dedication of earthly goods to all*, including coming generations (cf. HZS 133, 137).²⁷ Justice also relates to behaviour towards the environment, the creation which God entrusted all people, including those not yet born, with caring, managing, and taking responsibility for (cf. HZS 63, 67 f., 79, 81, 90). This is why protecting the climate and conserving the natural resources is an indispensable dimension of securing the common good and therefore of justice.

(39) The following threatening or existing impacts of climate change represent an unacceptable *injustice*: the premature death of large numbers of people, the extinction of numerous animal and plant species, the impairment of physical and mental health, food insecurity, famine and malnutrition, shortages of drinking water plus conflicts for resources, flight, all associated with the loss of home, safety and security, the loss of quality of life, private, corporate and economic financial damage, adaptation and insurance problems caused by the immense and hardly calculable costs, decline in the economic performance and revenue, particularly of vulnerable countries, unevenly distributed effects (inversely proportionate to the causes) plus ever-increasing problems of injustice like hunger, poverty and suppression and their interaction. If the yardstick of justice in its three dimensions is applied to the phenomenon of climate change, it becomes apparent that the dangerous anthropogenic influence on the world climate is not some inevitable fate, but rather repre-

²⁷ Cf. also Pontifical Council for Justice and Peace (note 25), No. 466 f.

sents a massive injustice that only intensifies existing inequality.

(40) The *priority option for the poor*, the weak, the disadvantaged and the excluded (cf. HZS 112, 130, 137) forms an essential nucleus of the Christian faith. This is why the Church – in view of the denied or threatened justice – stands up in solidarity for God's creation and for the victims of climate change, especially the poor, the old, the sick, children, the unborn and the coming generations (cf. HZS 137), and supports their interests in public negotiations. For climate change and its consequences threaten fundamental *human rights* (cf. HZS 129, 136) of current and future generations: the right to life, the right to physical and mental inviolability and to health, the right to food, to decent employment and work, to social security and property, and the right to an intact environment. If the commitment to human rights and to the life chances of the poor is to become effective today, then it must be integrated into an active policy on the climate and the future.

(41) Climate change does not affect everybody equally. The poorer and weaker people are, the fewer options they have for avoiding, adapting to, protecting against and insuring against the consequences of climate change or redressing reversible damage. This also applies to whole regions of the world. Compared with the rich industrial nations, the countries of the "South", as well as the Arctic and its neighbouring countries, are affected to a much greater extent. People living there are ever-increasingly being affected by the consequences of climate change, even though their per capita contribution towards the causes of that change is (still) negligible. Much the same applies to the poorer population groups in rich countries. This is why it is a question of justice that the industrial, transforming and emerging nations as well as the elites in the developing countries set limits for their own "fossil" development and take

on the main burden of the measures needed worldwide to avoid or at least mitigate these, to adapt to and to master these changes. The "*polluter pays principle*" (cf. HZS 147) actually demands that the costs of any damage caused are retrospectively borne, thereby also looking to the future to include all foreseeable costs for humankind and environment in the prices, so that these tell the ecological truth (internalisation of negative external effects).

(42) A fundamental change to the current climate-damaging patterns of production and consumption, of technologies and lifestyles is called for towards a situation in which all social and economic processes are integrated into the network of ecological closed loops that bear these (*retinity*, cf. HZS 96, 114, 118 ff., 140 f.). The required changes with respect to the global climate are particularly difficult to achieve. Because the climate is a classical case of a common good. All benefit from its protection, but each and every individual can draw more (short-term) advantage from dispensing with conservative measures or contravening these. On the one hand, this means that there is a lack of incentives to act in a climate-compatible manner and, on the other, that a free-rider mentality comes to the fore that builds on the preliminary moral work of others. To this extent, (short-term) self-interest means that it is rational not to contribute personally to protecting the climate. This common good dilemma can only be undone by collective agreements and self-commitments.

(43) As far as the problem of climate change is concerned, we are, despite all the certainty that we have meanwhile achieved, still "acting with uncertainty", since it is not yet possible to exactly predict how quickly and strongly climate change will proceed over the coming years and decades, and what its regional impact will be like. A decision-making aid is available here in the form of the *precautionary principle* that aims to reduce the

risks and to conserve the natural resources and bases of life, above all under consideration of coming generations. This principle has been embedded into German environmental legislation as one of the key principles, and also met with international approval, e.g. in the Rio Declaration of 1992. This declaration states: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."²⁸ Where decisions are made under conditions of uncertainty, the Christian ethic of responsibility gives priority to the worst and only just plausible prediction, as long as the resulting options would not cause even worse conditions and the ability to act in complex contexts remains intact.²⁹ The only acceptable long-term prospect (also in economic terms) suggests acting in line with the precautionary principle (cf. HZS 104, 147): "The principle of judicious precaution demands protective provisions, even against dangers that only seem possible, and especially when many genuine signs point to these and when there is a risk of irreversible consequences. The probability of their realisation and the scope of the damage must be weighed up carefully against the effectiveness and the costs of precautionary measures and the necessary reorientation measures associated with this."³⁰ To implement this precautionary principle, the document "Handeln für die Zukunft der Schöpfung" set a number of useful yardsticks and benchmarks, which,

²⁸ Rio Declaration on Environment and Development. The United Nations Conference on Environment and Development, <http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=78&ArticleID=1163>.

²⁹ Cf. *Scheule, Rupert*: Rational choice theory, funktionale Differenzierung und theologische Ethik. Ein Annäherungsversuch, in: *Zeitschrift für Katholische Theologie* 127 (2005) No. 1, 25–56.

³⁰ *Beirat des Beauftragten des Rates der EKD für Umweltfragen: Gefährdetes Klima – Unsere Verantwortung für Gottes Schöpfung* (EKD-Texte 52), Hannover 1995, No. 15.

for example, suggest that actions are oriented in line with the capacity of ecological systems (cf. HZS 95, 110, 115) and with the natural regenerative and assimilation capacity (cf. HZS 109 f.), and with the requirements of thrift and efficiency (cf. HZS 110, 117), sufficiency and voluntary moderation as a path to greater quality of life (cf. HZS 117) plus damage reduction and reversibility (cf. HZS 147).

(44) Besides the "polluter pays principle" and the precautionary principle, the Christian perspective is that the *principle of proportionality* must be maintained, because the good purpose of climate protection – for the sake of humankind and creation – does not justify every possible means. For example, any measures to prevent, mitigate, adapt or cope with situations must firstly be *suitable* for averting the danger(s), and secondly be *necessary* to defend against dangers, which means that no lesser interventional measures must exist that could also have been suitable, and, finally, they must also be *appropriate*, which means that the damage caused by or accepted for the measures must not be greater than the benefit achieved. This principle can help to choose between various climate protection measures, but it must not be used to justify inactivity or reluctance.

(45) This means that the core position taken by the Church on climate change follows the postulate of *justice* – in the relationship between the rich countries of the North and the poor countries of the South, between rich and poor within nations, between generations as well as between humankind and nature. For a start, therefore, the poor and the disadvantaged are afforded the *same rights* as the wealthy in respect of resources and (unavoidable) emissions. Consequently, emissions reductions in the countries of the North must be much greater than those in the countries of the South. From a Christian-ethical perspective, *solidarity with the present and future victims* of climate change is a priority matter. The decisive ethical-politi-

cal challenge lies in overcoming the short-sighted egoisms and in steering the moral, political and economic resources for solidary action – beyond the scope of post-disaster aid measures – towards the field of *precautionary climate and energy policies*. At global level, this calls for the position of the United Nations and its programmes to be strengthened, including, above all, the United Nations Environment Programme (UNEP), and for the other global institutions, such as the World Trade Organisation (WTO), the International Monetary Fund (IMF), and the World Bank, to focus more on a policy of sustainable development. Because only then can effective strategies against the common good dilemma of the excessive use and endangerment of freely available resources assert themselves. Forward-planning, precautionary climate protection calls for *global cooperation*. This can only be achieved under conditions of justice.

4. Opting to Protect the Climate in Solidarity with the Victims

4.1 The Need for a Global and Integrated Climate Policy

(46) Effective worldwide cooperation to protect the climate is absolutely essential. The "Kyoto Protocol to the United Nations Framework Convention on Climate Change" of 1997 marks a step in this direction. Although extensive (ecologically questionable) concessions had already been agreed to make it "acceptable" at all, the Kyoto Protocol still only managed to come into force on 16 February 2005 – without the participation of the United States, which currently accounts for only 4.5% of the world population but alone for almost 23% of the worldwide energy-induced CO₂ emissions. This means that Kyoto, whose mandatory phase ends in 2012, is nothing more than a modest beginning. If we were to remain at the Kyoto level, it would probably not be possible to "recognise any changes to the 'business as usual' scenario"³¹ until around 2050. Further negotiations aimed at achieving much more substantial reductions and including as many relevant countries as possible, above all the United States and China, as well as emerging economies, must

³¹ *Bundesministerium für Bildung und Forschung (BMBF)* (ed.): Herausforderung Klimawandel. Bestandsaufnahme und Perspektiven der Klimaforschung, Berlin 2003, 51. This is a study produced by Sachverständigenkreis "Globale Umweltaspekte" (SV GUA) of the BMBF working group on "Klimadiskussion".

consequently follow. To this end, the Climate Summit held in Montreal in 2005 prepared the way for entry into formal post 2012 negotiations. It is to be welcomed that the participants agreed on the implementation package (the so-called Marrakesh Accords) and the creation of a success monitoring body equipped with far-reaching options for incentives and sanctions based on binding international law.

(47) The Kyoto Protocol is the first internationally binding climate protection treaty and so marks a decisive starting point for further reaching contractual agreements and a major success and quality leap forward in global environmental politics. For, according to the estimates of climate researchers, global CO₂ emissions have to be reduced by at least 60% of the 1990 level by 2050, equating to an 80% reduction for industrial countries on account of their higher starting level. "This is both technically possible and economically viable"³². Fully in line with this, the European Union Environmental Council spoke out on 10 March 2005 in favour of reducing all greenhouse gas emissions (from base year 1990 on) by 15% to 30% by 2020 and by 60% to 80% by 2050. On 8 March 2007, the EU heads of state and government made a firm commitment to achieve a 20% reduction of greenhouse gas emissions compared to 1990. A 30% reduction is envisaged, provided that other developed countries commit themselves to comparable reductions. Compared with this, the Kyoto reduction target of 8% by the EU and 5.2% by industrial countries is only a first small step. But even achieving this modest target is anything but certain considering the fact that, by early 2007, the EU was able to reduce the emissions by only 1.2%.

³² *Federal Environmental Agency (Umweltbundesamt): The Future in Our Hands – 21 Climate Policy Statements for the 21st Century*, Berlin 2006, <http://www.umweltdaten.de/publikationen/fpdf-l/3013.pdf>.

(48) However, the greater and unavoidable reduction targets can only be achieved if the western societies, above all, and particularly also our German society, undertake far-reaching socio-economic reorientation and structural reform towards a future-viable, ecological-social market economy (cf. ZSG 142 ff.) and if the rest of the world learns from the mistakes of the industrial countries. Indeed, it is ethically necessary that we in Germany and in the EU massively reduce our greenhouse gas emissions, and compensate the (still) unavoidable emissions, so that people in poorer countries actually have any development chances at all, because if the poor have no access to energy, development is inconceivable.³³ This means that the supply of energy has a key role to play, because it can and must gradually become independent of fossil energies in industrial, emerging and developing countries. "The current unsustainable patterns of production and consumption must be changed in the interest of our future welfare and that of our descendants."³⁴

(49) This calls for all citizens to actively take a share of the responsibility, for environmental education that raises people's awareness, informs them and motivates them, and for global and integrated policies that meet the principle of retinity and the interdependence of social, economic and ecological problems. The environmental policy practised to date must step out of its pigeonholed and shadowy existence. It must be integrated into a policy of sustainability that encompasses all areas of politics and by doing so is actually able to create the conditions needed

³³ Cf. *Misereor*: Energie für die Armen. Ein Positionspapier, erarbeitet von der Projektgruppe „Zugang der Armen zu Energie“ (May 2004), http://www.misereor.de/fileadmin/user_upload/Medienkatalog/12-2005/Energie-fuer-die-Armen.doc.

³⁴ Cf. United Nations Millennium Declaration 2000, I.6. Resolution adopted by the General Assembly, <http://www.un.org/millennium/declaration/ares552e.htm>.

for a *precautionary* and promising climate policy. Out of solidarity with the present and future victims, greater efforts than in the past must now be undertaken to slow down climate change and to use appropriate adaptation measures to cushion its negative impact.

(50) However, the international climate policy of past decades also clearly shows how difficult and cumbersome agreement processes are. Given this background, in particular, it is absolutely essential that not only the necessary, internationally coordinated approaches are implemented. Rather, such measures must also be introduced at national and regional level that extend beyond the contractually agreed framework. Pioneers in this field create incentives for technical innovations in their own country, for the development of new products and production methods, improve their competitive edge, and so contribute importantly to protecting the climate.³⁵

4.2 Mitigating the Causes of Climate Change

(51) The problem of climate change will not be solved that quickly as a result of the dynamics that have been set in motion, of the lack of awareness among the population, of the opposition of self-interested lobbyists, of the inadequate political will among those in government, and of the inability of "climate protectors" to assert themselves. The new catchwords of inter-

³⁵ Cf. *German Bishops' Conference Research Group on the Universal Tasks of the Church* (ed.): *The many faces of globalisation – Perspectives for a humane world order. Study by the Group of Experts on "World Economy and Social Ethics"* and the Church agencies *Adveniat*, *Caritas international*, *Misereor*, *missio Aachen*, *missio München* and *Renovabis*, Bonn 2000, 30.

national climate management are therefore *mitigating* greenhouse gas emissions and *adapting* to the consequences: preventing the worst and adapting as well as possible to the circumstances, because we will have to, not least, prepare for a growing number of so-called natural disasters with increasing numbers of victims.³⁶

(52) Mitigation and adaptation stand here for two mutually complementary not alternative packages of measures, because even with an extremely successful mitigation policy, adaptation to the consequences of climate change remains unavoidable. According to the Climate Convention, greenhouse gas concentrations in the atmosphere are to be stabilised "at a level that would prevent dangerous anthropogenic interference with the climate system".³⁷ Yet, even if this objective of keeping warming under the so-called 2°C ceiling³⁸ were achieved, the developing countries, in particular, would have to adapt to climate change. Relying solely on the adaptation efforts would, however, be the wrong path to take. Such an approach would be unfair, since it would release the major originators from their responsibility, would involve substantial risks and irreversible damage, and would far exceed the financial capacity of many poor countries and people. Moreover, an unmitigated climate change would, in the long term, be likely to exceed the capacity of natural, managed and human systems to adapt.³⁹

³⁶ Cf. *WCC* (note 19), 8 and 17.

³⁷ Climate Convention, Art. 2 (note 5), 7.

³⁸ In March 2005, the European Council decided to develop a new EU strategy to combat climate change, with the goal of limiting the increase in the global surface temperature to a maximum of 2°C. Cf. *WBGU* (note 12), 9 f.

³⁹ Cf. *IPCC WG II* (note 15), 10 ("likely" means 66 to 90% probability of occurrence; cf. *ibid.* 22).

(53) This must also be taken into consideration in the current debates on the appropriateness of mitigation measures. A number of US economists are of the opinion that the costs of the damage and the adaptation measures are much lower than the costs of reducing greenhouse gas emissions, which supposedly cause greater growth losses both in the developing countries as well as in the industrial countries. If this analysis were correct, such a conception of climate protection would contradict the principle of proportionality. However, this view is countered by the more convincing opinion that the mitigation costs, and so the growth losses caused by climate protection measures, are overestimated, because, indeed, the possible technical progress that can be triggered by a shrewd climate policy has been drastically underestimated. In addition, it must be remembered that the costs of damage and adaptation measures are much more difficult to assess and calculate in monetary terms than are the costs of mitigation. In the meantime, ever more signs are appearing for the fact that even ambitious stabilisation scenarios can also be achieved at comparatively low costs. The Stern Review has shown that the benefits of resolute and early action by far outweigh the economic costs of inactivity.⁴⁰

(54) It is particularly the industrial countries and the emerging countries that are obliged to reduce greenhouse gas emissions and to stabilise the concentration levels. A wealth of political and technical measures are available for this that have by no means been exhausted yet and that should, as far as possible, be integrated into a future architecture for the Kyoto Protocol. There is no *absolute* method of choice, rather a whole mix of

⁴⁰ Cf. *Stern* (note 22) ii, and *Edenhofer, Ottmar/Kempf, Claudia/Lessmann, Kai/Grubb, Michael/Koehler, Jonathan*: Technological Change: Exploring its Implications for the Economics of Atmospheric Stabilization. A Special Issue to *The Energy Journal*, 2006, 57–107. The Stern Review's assessment of avoidance costs refers to this study.

instruments need to be used to reach the demanding reduction targets.

- *Saving energy and raising energy efficiency*: Economic reason plus social and ecological responsibility simply demand that greater use than in the past is made of energy-saving and energy-efficiency-increasing measures, because they are important, climate-friendly and, furthermore, job-saving or job-creating "energy sources". Enormous potentials in this field continue to lie dormant, even here in Germany. For example, by raising the efficiency of power stations, when building new houses (low-energy and passive design), when redeveloping old buildings, by avoiding traffic, by reducing the consumption of engines, and by stemming the (stand-by) consumption of electrical devices. Substantial amounts of energy, and so valuable natural resources, continue to be wasted with the consequence that enormous amounts of greenhouse gases are emitted for absolutely no reason. This is why the commitment of the European Council of 9 March 2007 to raise energy efficiency by 20% by 2020 is an important signal.
- *Expanding the use of renewable energies*: For reasons of sustainability, we must abandon the fossil route to generating energy in favour of renewable energies. Their share of the energy supply can and must be extensively increased, for example through more incentives for investments in research and development, through a (diminishing scale of) start-up funding, through appropriate political measures and by abolishing subsidies and privileges for fossil energy sources and nuclear energy. In this respect, the EU's decision of 9 March 2007 to increase the percentage of renewable energies to 20% by 2020 is a positive move. To cover the remaining demand, low-carbon technologies need to be

preferred to those with an inferior CO₂ balance. Whether nuclear energy represents a permanently feasible solution must be doubted, since uranium has to be imported and uranium reserves are limited, but above all because it is associated with serious risks and with unresolved follow-up problems (such as intermediate and final disposal), which cannot, for reasons of intergenerational justice, simply be passed on to following generations. This contravenes the principles of precaution and proportionality.

- *Price-based instruments, especially in the form of energy and climate taxes:* "The higher the costs for or prices of environmentally harmful production processes and goods are and the more expedient the production and consumption of environmentally friendly goods are, the more stronger will the call to individual responsibility be supported by the commercial considerations of producers and consumers."⁴¹ Since the beginning of 2004, the Directive on Harmonising Energy Taxes has been in force in the EU. This fundamentally means that a minimum rate of taxes must be applied to all energy sources, not only to mineral oils (heating oil and fuels), but also now to electricity, natural gas and coal. The increase in prices for fossil energy sources that was desired by politicians for climate protection and other reasons not only leads to prices that give greater consideration to the ecological follow-up costs, but also and additionally creates incentives for saving energy and for technical innovations. The possible full tax exemption on electricity produced by regenerative means can, if it is used, lead to a relative price

⁴¹ *Church Office of the Evangelical Church in Germany/Secretariat of the German Bishops' Conference* (eds.): Verantwortung wahrnehmen für die Schöpfung. Gemeinsame Erklärung des Rates der Evangelischen Kirche in Deutschland und der Deutschen Bischofskonferenz, Gütersloh 1985, No. 83.

cut and improved competition for climate-friendly, renewable energies. In addition, the path is now open to taxing kerosene on domestic flights and on flights between member states, which opens up an opportunity for putting a long overdue end to a hidden, climate-harmful subsidy. This is also urgently needed, since flights are now estimated to account for 9% of human-induced global warming, with a strong upward trend. Eco-taxes are a step in the right direction when setting incentives for the more economical and efficient use of (fossil) energies. This is above all called for in the problematical emission areas of private households and motorised traffic. Ecological taxation should, however, be oriented in line with the environment and climate-related consequences of the individual energy sources and should be free of any ecologically questionable exceptions and of any justice or equality gaps. In addition, it should be expanded to form a comprehensive ecological tax and finances reform.⁴²

- *Quantity instruments*: A realisation is gaining ground that the atmosphere can no longer be treated as a common good, as a free good. Rather, a price must be paid for using it. And so trade in so-called emission certificates aims to limit the emission of greenhouse gases. At regional, national, sub-national and company level, this trade has meanwhile become very important to climate protection. Because emitting climate gases becomes much more expensive, which in turn makes investing in preventive measures or in renewable energies more attractive. Since the beginning of 2005, for example, companies in the EU have been able to trade

⁴² Lienkamp, Andreas: Light-Version. Die deutsche ökologische Steuerreform: Holzweg oder Königsweg?, in: Herder Korrespondenz 54 (2000) No. 2, 75–81.

emission rights with each other, albeit initially only for CO₂. However, two rules have to be observed, so that this trade really does meet the criteria of sustainability: "1. Countries should not be allowed to fulfil more than a certain percentage of their obligation (e.g. 50%) by buying certified emission rights; they must at the same time give the proof of domestic action through investments in renewable energies and energy saving technologies. 2. Since climate change urges for reduction far beyond the targets of the Kyoto Protocol, dynamic rules must be adopted which secure a gradual reduction of emission rights."⁴³ When organising the global trade in certificates, not only must the questions of auctioning and decreasing the number of emission rights be considered, but, also and above all, questions of social justice, for example, when deciding which emission rights developing countries are to be equipped with. At present, only part of the emissions are governed by means of certificates. As far as possible, however, all sectors of a national economy should be involved in the certificate trading, because only then will it be able to unfold its full effect, and because only then can search strategies for the lowest avoidance costs be successful. For example, the inclusion of air travel in the emission trade, as is currently being discussed within the EU Commission, and which is considered to be introduced in 2011/12, would be a suitable measure.

- *Joint Implementation and Clean Development Mechanisms (CDMs)*: These flexible instruments enable countries or companies to carry out climate protection projects in other countries. They receive emission credits for this equal to the

⁴³ Vogt, Markus: Climate Change – a Roman Catholic View. Choosing Life: Reflections on the Churches' Role in Protecting the Climate, in: *European Christian Environmental Network* (ed.) (note 1), Part V, 1–3, here 2.

greenhouse gas reductions achieved. The obligatory environmental compatibility tests must, however, be complemented by social compatibility tests. Nuclear energy projects should continue to be excluded for the above-mentioned reasons, and the use of emission credits from so-called carbon-sink projects in which CO₂ is bound in biomass must still be subjected to critical examination. The two instruments are useful, if possible misuse is prevented, which means, for example, that proof must always be provided that a project could not have been achieved without CDMs. In addition, they correspond with the principle of proportionality, since they make it possible to achieve greenhouse gas reductions at lower costs. However, attention must be given to ensure that developing countries with large surface areas, in particular, are not simply be instrumentalised for the interests of the North and that the user interests of the local population are preserved. Plans by the North to view or use developing countries as mere "compensation areas" for greenhouse gas emissions must be rejected, because this takes away the local people's own development chances. The reduction of greenhouse gas emissions must primarily be performed by those who cause them.

- *Reducing deforestation and adopting sustainable forest management strategies:* According to the FAO's 2007 State of the World's Forests report, from 1990 to 2005, the world lost 3% (7.3 million hectares) of its total forest area which is more than three times the area of Germany. Global warming further aggravates this problem: "There is increasing evidence that forests will be profoundly affected by climate

change."⁴⁴ In addition, forest fires as well as pest and disease infestation increasingly endanger forest health. Therefore, the negotiation process that began in Montreal in 2005 must search for solutions on how the international community can create incentives to slow down the process of deforestation, especially in developing countries. In particular, this must be done to stop the rapid clearing of rain forests that are of such prime importance to species diversity and the climate.

- *Reforestation*: Controlled reforestation programmes point in a similar direction to the binding of CO₂ in biomass, whereby the wood could also partly replace fossil fuels. According to the Stern Review, in 2000, reforestation contributed to a global CO₂ absorption of about 1 billion tonnes (whereas, in the same year, deforestation produced CO₂ emissions of more than 8 billion tonnes). However, such programmes must not be used as an excuse for undiminished or even increased greenhouse gas emissions. It is also important to avoid a situation where reforestation in the South to benefit further emissions in the North leads to an ever-growing economic imbalance between the industrial countries and the developing countries. Furthermore, it is important to rule out the possibility of existing forests simply being cleared to gain spaces so that these areas can then be reforested with subsidies. This would be a wrong approach also because young plantations will absorb much less carbon for many years and the biodiversity in young plantations will be clearly less than in natural forests.
- *Carbon capture and storage (CCS)*: The process of capturing CO₂, for example, directly from coal-fired power stations,

⁴⁴ *Food and Agriculture Organisation of the United Nations (FAO): State of the World's Forests 2007, Rome 2007, 64, 74.*

and its subsequent liquefaction and storage in geological formations could – in contrast to the extremely risky dumping at sea – offer, as a transitional solution, another path to mitigating the looming risks of dangerous climate change. However, this method's technical realisation is still in its early days. In any case, the entire process chain (including transport) must be assessed as to the risks and additional emissions of greenhouse gases and pollutants. CCS is problematical, because it only addresses the symptoms and not the causes and, in fact, actually hinders the necessary abandonment of fossil energies in favour of renewable ones. A resolute promotion of energy-efficiency-increasing measures and renewable energies can contribute to climate protection much more immediately than CCS.⁴⁵

- *Sustainable traffic and settlement policies*: In order to contribute to climate-compatible mobility and settlement patterns, the state can and must increase its efforts to provide financial and infrastructural support to encourage non-motorised traffic, a climate-friendly public transport system, and car sharing as well as urban planning designed to bring place of residence and workplace closer together. In addition, it must put a stop to the sealing of surfaces and the loss of wooded areas.
- *(Voluntary) agreements with companies*: In 2001, German industry entered into a voluntary agreement to reduce CO₂ emissions by 45 million tonnes by 2010 (in comparison with 1998), equal to just under 9%. 20 million tonnes of this

⁴⁵ Cf. *Wuppertal Institut für Klima, Umwelt, Energie/Deutsches Zentrum für Luft- und Raumfahrt/Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg/Potsdam-Institut für Klimafolgenforschung*: RECCS – Strukturell-ökonomisch-ökologischer Vergleich regenerativer Energietechnologien (RE) mit Carbon Capture and Storage (CCS), Wuppertal, Stuttgart, Potsdam 2007, V.

alone are to be saved by extending the use of combined heat and power (CHP) methods. Recent years, however, have seen industrial and power industry emissions increase, which clearly illustrates the weakness of this instrument. Consequently, it must be complemented by policy changes to the relevant frameworks. Companies and banks must review their actions and must organise their product and production policies as well as their investment, asset and loan decisions with climate compatibility in mind. Mandatory environmental reports could serve to ensure transparency and corresponding pressure to take measures aimed at sustainability. Companies are promoters of knowledge transfer and so also have an important role to play in the establishment of climate-friendly technologies and attitudes worldwide.

- *Changing lifestyles:* A wealth of opportunities exist at individual, family and household level for developing climate-friendly life, mobility and consumption patterns. Education policy has an important role to play in this context and needs to address the topic of environmental education to a much greater extent than it has in the past. The world decade of "Education for Sustainable Development" announced by the United Nations for the period from 2005 to 2014 offers a welcome occasion for reorientation. In addition, accommodating structures are needed to encourage sustainable behaviour.

Politics must set incentives for the actions of people, households, institutions, organisations and companies in such a way that climate-friendly behaviour becomes much easier to pursue and climate-harmful behaviour much more difficult.

4.3 Adapting to the Consequences of Climate Change

(55) Adapting to the consequences of climate change can mean, for example, building dikes to stop repeated flooding, improving farming conditions in arid zones, applying protective architecture that takes into account conditions in storm and heat relevant areas, or developing health programmes.

- This also calls for a *reorientation of development strategies*. The prime benchmark for future development concepts must be to ensure that basic needs are met under humane conditions and on a sustainable basis. This requires efforts that reduce the vulnerability of individuals, population groups and countries to the consequences of climate change. Prime attention in this respect focuses on improving the ability and skills needed to survive under deteriorating living conditions and to secure one's own existence long-term. The spending needed for precautionary and adaptational measures aimed at reducing this vulnerability will probably draw on financial resources that would otherwise be available to economic and social development programmes.
- The increasing frequency with which extreme weather events occur means that so-called "natural" disasters can no longer be viewed as isolated phenomena. A better assessment of how the climate will develop in the future can indeed, on a case-by-case basis and in conjunction with concrete (short-term) weather forecasts, help to take preventative measures in good time. In addition, however, *disaster management* as well as *emergency and reconstruction aid* need to be organised globally, which means that specialist staff need to be trained and equipped with the requisite

technology and tools, that the financial resources allocated to disaster aid need to be increased in the national budgets, that contingency plans need to be set up and that humanitarian answers need to be found to address the growing problem of environmental refugees.

(56) Given all this, the capacities available for the optimal adaptation to changing climatic conditions are distributed extremely unevenly between rich and poor countries. The poor, in particular, cannot insure themselves against the growing risk at reasonable cost. International solidarity is called for here, but above all, a more pronounced assumption of the burdens in line with the "polluter pays principle". The support given so far to the developing countries for adapting to climate change, including from the EU, is completely inadequate. The main polluters, including Germany, must contractually acknowledge their obligations to compensate any existing and future damage and to make sufficient financial resources available for adaptation measures. Development organisations estimate that between 300 and 500 billion euros per year are needed for this. The financial funds available for transfer payments to developing countries within the scope of the Climate Convention and the "Adaptation Fund" set up under the Kyoto Protocol consequently urgently need to be topped up and increased.

(57) Support for the poor in adapting to the consequences of climate change, in disaster management, and in emergency and reconstruction aid is not a question of pity, but rather one of justice. Because these consequences are primarily caused by lifestyles and industrial activities pursued by rich nations and population groups that therefore simply must take on their moral and political responsibility and so act accordingly. This is also why agreements on the rules of international trade, on financial cooperation and on the administration of common

goods must be judged through the eyes of the poorest victims and in respect of the impact on the climate.

4.4 The Witness of the Catholic Church in Germany

(58) The field of climate protection has no lack of general moral appeals. Rather, it lacks the broad implementation of exemplary and credible action. This is why giving witness is, including for the Church itself, a prerequisite for its ability to fully unfold its ethical competence.

(59) In view of the urgency of the problems at hand, the Catholic Church has not yet done everything that it could have and should have. In terms of reflecting on and practising climate protection, a backlog exists and much catching up still needs to be done. Nevertheless, quite a few, certainly encouraging examples of climate protection already exist among Christians, of which some – relating here to Germany only – will be presented below:

- Some Church institutions, especially monasteries, convents and educational facilities, now use renewable energies. Some few representative examples of such projects are: Kloster Marienthal (100% use of renewables since 2000, above all, water and biomass, in a grid operated together with the village of Ostritz, whose 5,000 inhabitants are supplied with regenerative energy), Burg Feuerstein (wood chip heating, solar and rapeseed energy plus a ventilation system with heat recovery system, conversion in operation since 1997), Kloster Benediktbeuern (wood chip heating, water and solar energy, covering 85% of the demand for six educational facilities and the community's residence, since

2001), Benediktinerabtei Münsterschwarzach (large-scale solar energy system and environmental management), Katholische Landvolkshochschule Petersberg (ecological building, passive use of solar energy facilitated by facing the building southwards, major savings in the consumption of thermal energy) and Benediktinerabtei Plankstetten (wood chip heating, solar energy plant). The diocese of Freiburg established an energy fund to promote investments in energy saving measures and/or renewables.

- With its "global village – Erneuerbare Energien für eine gerechte und zukunftsfähige Welt"⁴⁶ project, the Katholische Landjugendbewegung Deutschlands (KLJB)⁴⁷ designed a large meeting centre at the World Youth Day 2005. Discussions were held – with great media interest and many international guests – on questions of responsibility for creation, climate protection, and the opportunities offered by renewables. Two years earlier, the KLJB had launched its "10.000 plus – Energie für die Zukunft"⁴⁸ campaign, a successful competition aimed at introducing energy-saving light bulbs into its own educational facilities, in parish buildings, and private domestic residences. It also offered additional information and discussion events. These actions are mentioned here as typical examples of many other initiatives undertaken by Church youth organisations.
- Around 250 Catholic parishes or institutions installed solar-thermal or photovoltaic systems and furthermore contribute through their information and education work to raising

⁴⁶ Global village – renewable energies for a just and future-viable world.

⁴⁷ Movement of Catholic Rural Youth in Germany.

⁴⁸ 10,000 plus – Energy for the Future.

public awareness. This ecumenical initiative was substantially funded by the Deutsche Bundesstiftung Umwelt.⁴⁹

- Supported by energy consultants, parishes and Church institutions were able to identify areas of excessive energy consumption and to undertake appropriate measures on heating and electricity and so make substantial energy and, therefore, emissions and costs savings.
- The in-service training programme "Wege zum schöpfungsfreundlichen Handeln"⁵⁰, offered over recent years by the KLJB Academy in cooperation with other educational institutions and the environmental officers of the dioceses, contributes to qualifying Church staff in the various work areas relevant to creation-friendly action. Aspects of climate protection play a key role here.
- The "Kirchliches Umweltmanagement"⁵¹ project is an initiative on climate protection, on conserving resources and on sustainable development. The project encompasses an ecological focus for all areas of action in accordance with the model of the European Eco Management Audit Scheme (EMAS). So far, some 180 Protestant and Catholic institutions have joined the project. A continuation and expansion of this initiative at European level has already started under the heading "Sustainable Churches".⁵² Binding environmental guidelines issued by some dioceses also point in this

⁴⁹ Federal German Environment Foundation.

⁵⁰ Paths to Creation-Friendly Action.

⁵¹ Church Environmental Management.

⁵² Cf. *Kontaktstelle für Umwelt und Entwicklung*, <http://www.kate-stuttgart.org>, and *Vogt, Markus*: Zeugnis für den Schöpfungsglauben. Eine Zwischenbilanz des Pilotprojektes Kirchliches Umweltmanagement, in: *Herder Korrespondenz 57* (2003) No. 8, 417–421.

direction, such as already adopted in the bishoprics of Mainz, Passau, Regensburg and Trier.

- In some cases, sustainability, and so climate protection as well, has already been established as a key criterion in development cooperation, for instance, when funding development projects carried out by Church aid agencies. A core focus in these projects centres on farming and food security, two areas most affected by the consequences of climate change.⁵³ For example, in the development cooperation done by Misereor, the projects on sustainable farming and forestry eventually aim to raise awareness for preserving and conserving the environment, for example, by maintaining soil fertility or by influencing the microclimate and water balance through (re)forestation, agroforestry and measures to prevent erosion. Such projects are designed long-term and will only succeed if environmental awareness grows slowly but constantly and is reflected in human action. This also applies here in Germany.
- The ecumenical initiative "Autofasten"⁵⁴, in which well over 7,000 people took part during Lent by, as far as possible, living without a car and reflecting on their experience, was jointly launched by the bishopric of Trier together with the Protestant Church in the Rhineland. The project has now been running since 1998 and is meanwhile carried out by the bishoprics of Mainz and Limburg and by the Protestant Churches of Hessen-Nassau and the Palatinate as well as in Luxembourg and in parts of Austria.

⁵³ *Church Office of the Evangelical Church in Germany/Secretariat of the German Bishops' Conference* (eds.): *Neuorientierung für eine nachhaltige Landwirtschaft. Ein Diskussionsbeitrag zur Lage der Landwirtschaft* (Gemeinsame Texte 18), Hannover-Bonn 2004.

⁵⁴ Car fasting.

The environment ministries of the Rhineland-Palatinate and the Saarland as well as public transport companies, rent-a-bike points, car sharing companies and environmental associations and organisations are taking part in this campaign. A scientific study found that around 60% of the participants permanently changed their mobility patterns. Smaller initiatives were carried out in many individual Church associations and groups, for example on environmentally aware forms of mobility that could be summarised under the heading of "Mobil ohne Auto"⁵⁵. These can also serve as models for managing the car fleets and mobility patterns of Church administrations and institutions.

- The Catholic Church has signed a framework agreement with Deutsche Bahn AG which provides for a discount on tickets for official trips of Church employees.
- The ecumenical initiative "Aufbruch – anders besser leben – Zukunftsfähig mit Körper, Geist und Seele"⁵⁶, which developed from the environmental movement in the former German Democratic Republic, made a voluntary commitment to a sustainable lifestyle. The key principles are: "Less is more", more quality of life for all through the inner freedom to do without and by cutting back the focus on material consumption (a good 1,000 participants have joined so far).
- At major Church events, climate protection is becoming ever more important, for example, saving energy, conserving resources and avoiding waste. So the Ecumenical Church Convention held in Berlin in 2003 included complementary projects on energy aimed at counterbalancing

⁵⁵ Mobile without a car.

⁵⁶ Departure to a different and better life – sustainable with body, mind and soul.

CO₂ emissions. An EMAS-compliant environmental management system was used to organise the World Youth Day 2005. The Catholic Church Convention in Osnabrück in 2008 will be the first climate-neutral event of this kind.

(60) The initiatives mentioned here as representative examples are becoming ever more important because they are embedded in the daily efforts of many Christians to act responsibly at home, in the family and at work, in the Church and in society to promote climate protection. So far, however, these have tended to be individual initiatives. They need stronger support, more funding, need to be continued and advanced, brought together and concentrated, as well as copied and emulated.

(61) The strategic task for the Church contribution to climate protection consists essentially in taking individual examples of responsible action as both model and stimulus for the resolute, determined and long-term integration of climate protection into the structures of Church action in accordance with the various available opportunities. *And, at the same time*, as a basis for urging politics and industry to make the appropriate changes. Through the claim to sustainability, climate protection encompasses all fields of action. For the Church, this equally covers the pastoral, administrative and political co-responsibility. The recommendation made by the Second European Ecumenical Assembly held in Graz in 1997, namely to open up responsibility for creation as an essential dimension of Church life, including in the pastoral, and to secure this in structure and organisation, also applies to the protection of the climate.

(62) Three factors are essential for the sincere, earnest and resolute realisation and implementation of the Church's responsibility for the climate: (a) a pastoral integration of responsibility for creation into the Church identity, into the Church's welfare and social work, into the proclamation of faith, and into

liturgy; responsibility for creation is a genuine part of the Church's pastoral mission and so, must not fall prematurely victim to cutbacks; (b) decisive support and advocacy for changes to the political frameworks and to economic and social action to the benefit of climate protection, at local, regional, national, European, and global level; (c) the encouragement, promotion and implementation of practical initiatives for climate-friendly action and a reduction in the use of fossil energies. This topic is addressed in particular detail here, because it also affects the persuasive force of the two other fields of Church action. As Pope Paul VI said: "Above all the Gospel must be proclaimed by witness."⁵⁷ Energy-saving projects run by the Church, energy-saving building practises, conversion to regenerative fuels and energies to generate electricity and heat, Church framework agreements with the producers of regenerative energies in the liberalised European power market, stronger regional and decentralised energy supply structures, as well as initiatives on sustainable mobility, all serve to substantially raise the credibility of the Churches in their option for climate protection. The following initiatives can be of strategic importance in this respect and should be supported and implemented with priority:

- *Saving energy and using renewable energies*: The options for saving energy (insulating buildings, using energy-saving and energy-efficient technologies) and using renewable energies must be pursued with resolution and determination. This must be included in the guidelines for building and property services of the dioceses, since this is where the greatest climate protection potentials lie. Since financially

⁵⁷ *Pope Paul VI.*: Apostolic Exhortation "Evangelii nuntiandi", No. 21, http://www.vatican.va/holy_father/paul_vi/apost_exhortations/documents/hf_p-vi_exh_19751208_evangelii-nuntiandi_en.html.

favourable opportunities mostly lie in renovation work that is required for other reasons anyway, this must be planned long term.

- *Environmental management systems:* Environmental and energy management systems with mandatory reporting structures and an ecological suggestion system should be established as standard systems in parishes, Church administrations, educational facilities, Caritas facilities and religious orders. Systematic information, advice, support and funding for this would be greatly welcomed.
- *Sustainable investment:* The Catholic Church also invests in stocks, shares and pension funds. Reorganising the economy towards an ecological-social market economy must start by converting the energy system. This reorganisation requires financial resources. Sustainable investment funds attempt to influence investment decisions, without a loss of profitability, security or liquidity. The Catholic Church should act in this field in two respects. Firstly, it could invest more money in such investment funds and, secondly, could consolidate and further develop the guidelines for sustainable investment activities.
- *Making mobility sustainable:* Avoiding superfluous trips, converting official cars to more climate-friendly fuels and, above all, extensively avoiding air travel or at least ensuring their ecological compensation are part of a future-viable mobility structure. In addition, the Church should publicise campaigns like "car fasting" and "mobile without a car" and promote car sharing.
- *Initial and continuing education and training:* The Church should, in its capacity as an employer, firmly establish the idea of responsibility for creation and climate protection in its own initial and continuing education and training, in its

qualification measures and in the in-service training programmes offered for Church staff.

- *Environmental education:* Awareness-building campaigns by Church youth organisations (particularly KLJB), by family and women's organisations, by Church educational facilities, by religious orders and by diocesan councils deserve more respect and acknowledgement, support, publicity and strategic focus. The potential of Church child-care day centres, schools and universities should also play a greater role in serving climate protection.
- *Climate-aware purchases:* The Church is a major consumer and so is equipped with substantial market influence. Consequently, it should apply climate protection criteria in the planned group purchases made by the dioceses, by its social welfare organisations and by religious orders (e.g. an advance specifications campaign for an energy-saving car, framework agreements on climate-compatible power purchases, consideration of ecological aspects in the Church Management and Purchasing Unit established in September 2004). When buying food, consideration should also be given to climate, environmental and social aspects (controlled organic farming, regionality, seasonality, fair trade).
- *Concrete climate protection objectives:* The self-commitment by parishes, Church institutions and dioceses to meet demanding yet realistic reduction goals may serve as motivation for concrete activity strategies and their implementation.
- *Climate protection at major Church events:* At Conventions of German Catholics and major Church conferences or other large events, the model of the German Protestant Church Conventions should be followed at which the CO₂ emissions associated with the event are counterbalanced by sup-

porting appropriate renewable energy, energy saving and reforestation projects. This would be financed by a relatively small sum, for example, of 50 euro cents per day and person, plus a compensational fee for flights.

- *Church development cooperation:* Climate protection and solidarity with the present and future victims of climate change should be an integral topic in Church development cooperation and Church project financing (both in the aid agencies and the mission orders as well as in partnerships maintained by parishes and dioceses).
- *Awards for best practice:* Announcing an energy or climate protection prize could focus much more attention on outstanding examples of innovative climate protection performed within the Churches (appropriate models can already be found in some dioceses, e.g. in Freiburg, Paderborn, Regensburg or Trier).
- *Climate alliance:* The Catholic Church, along with the Protestant Church and cross-denominational organisations (the climate protection initiatives of the EKD, the European Christian Environmental Network and the Ecumenical Council of the Churches), should cooperate with other religious communities as well as with environmental groups, development organisations and government institutions to initiate a climate protection campaign in Germany and Europe (e.g. in line with the model "Towards sunny times" run by the Evangelische Akademie Bad Boll).

(63) Through its world-encompassing presence, the Catholic Church has great potential for promoting global environmental awareness and worldwide solidarity networks. In addition, similar organisational structures, transregional exchange and the traditionally high respect of its moral authority open up opportunities for promoting environmentally relevant ideas and meas-

ures, including in the political sphere. Dialogue between the bishops' conferences, dioceses, parishes and Church organisations can create awareness in much the same way as pastoral letters, publications, policy advice, media contacts, and educational material.

(64) Christians can draw the power of hope, joy and peace from their faith to enable them to change and to act with responsibility and, in the case of climate protection, also to contribute to necessary European and worldwide understanding. Acting with responsibility for climate protection bears witness of how Christians take their mission to conserve and shape creation seriously.

5. The Power of Our Faith

(65) The resolution "Unsere Hoffnung" adopted by the Joint Synod of the bishoprics in the Federal Republic of Germany in 1975 already stated that the Church has to mobilise the moral forces dormant within Christianity – in the interest of a life worth living for the disadvantaged and discriminated peoples as well as in the interest of the habitability of the Earth for those yet to come. "Faced by these worldwide problems, we Christians in the Federal Republic of Germany, in particular, must not close our eyes if we do not want to lower or bend the yardsticks of our hope."⁵⁸

(66) Standing in solidarity with the present and future victims of climate change among the poor and the weak, the excluded and the non-involved, representing their interests – as far as possible together with them – and empowering them to make their voice heard, is a central goal of the Church. For the sake of credibility and the persuasive power of the ethical arguments, the Church can and must put itself forward as a visible example. Resolute, determined and committed support for climate protection is not a side issue for the Christian faith, but rather an acid test for its power of liberating hope, creative innovation and unrelenting justice.

⁵⁸ The resolution "Unsere Hoffnung", in: Gemeinsame Synode der Bistümer in der Bundesrepublik Deutschland. Beschlüsse der Vollversammlung, Offizielle Gesamtausgabe Vol. 1, Freiburg-Basel-Vienna 1976, 110 f.