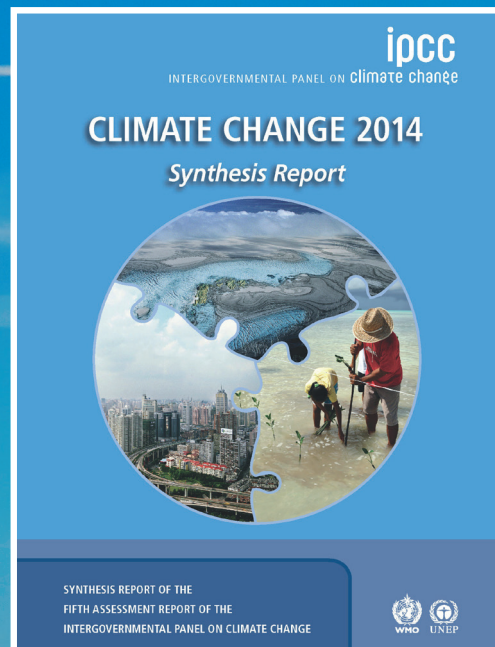


02/2014



# Outlook Earth

Research on global change



Interview with German  
Federal Minister  
Johanna Wanka

## IPCC: Where are we Heading?

Consequences for Climate Research

picture: Fotolia

# Climate Change: Research for the Future

**The results of the latest IPCC report are unequivocal. The IPCC's Fifth Assessment report shows that climate change is real and human influence has been the dominant cause of the observed warming. The lower atmosphere and the oceans are warming, glaciers and ice sheets are melting, permafrost is thawing, and the sea level is rising.**

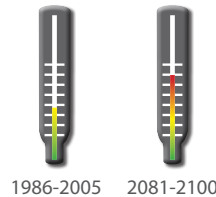
However, there is also good news: it is still possible to keep global warming below 2 °C compared to pre-industrial levels and to keep the impacts of climate change within manageable limits. But significant effort is needed to reduce the emissions of greenhouse gases such as CO<sub>2</sub> that affect the global climate. Adapting to the risks and impacts of climate change is a significant challenge – and greater rates and magnitudes of climate change increase the likelihood of exceeding available adaptation capacities.

The Synthesis Report of the Fifth IPCC report has now been published, but this does not mean that climate research has fulfilled its tasks and all of the issues have been resolved. Generally, climate change and its causes are well understood. The statements of previous IPCC reports are confirmed by the new one, but with increased accuracy due to refined observational techniques and climate models. There are, however, uncertainties remaining that need to be addressed to reach an even better understanding of the complex Earth system and the impacts of climate change. Important research questions relate to risk management or to the question of how climate change and adaptation options can help us get to grips with the climate problem, particularly at regional and local levels. This applies especially to developing countries.

In addition, more precise evaluation is needed to assess the effectiveness of the various approaches to adaptation to climate change at the local level. There is also a need for closer examination of the costs of climate change impacts, for example due to extreme weather events, or the effectiveness of policy instruments for climate change mitigation. There are still many questions that need to be addressed.

The framework programme „Research for Sustainable Development“ (FONA) of the German Federal Ministry of Education and Research (BMBF) promotes numerous research initiatives that strive to answer open questions in the field of climate change research, the results of which will be included in future IPCC reports. In this issue we would like to introduce four projects and funding priorities.

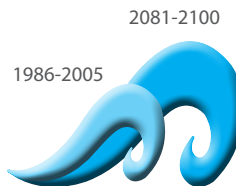
## Increase in global Ø-temperature by 2100:



**0,3 - 4,8 °C**

Source: According to IPCC, Working Group 1, 2013

## Increase in sea level by 2100:

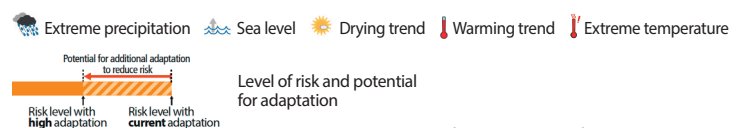


**26 -82 cm**

Source: According to IPCC, Working Group 1, 2013

## Key risks from climate change in Europe

Key risk	Flooding of settlement areas	Reduced water availability	Heat waves
Effects	Increased economic losses and people affected by flooding in river basins and coasts, driven by increasing urbanisation, increasing sea level, coastal erosion, and peak river discharges	Significant reduction in water availability from river abstraction and from groundwater resources combined with increased water demand (for irrigation, energy and industry etc.) and with reduced water drainage and runoff as a result of increased evaporative demand.	Increased economic losses and people affected by extreme heat events: impacts on health and well-being, labour productivity, crop production, air quality.
Climatic drivers			
Risk and potential for adaptation	<p>Timeframe Long term (2080-2100)</p> <p>Very low    Medium    Very high</p> <p>2°C    4°C</p>	<p>Very low    Medium    Very high</p> <p>2°C    4°C</p>	<p>Very low    Medium    Very high</p> <p>2°C    4°C</p>



Source: According to IPCC, Working Group 2, 2014

## IPCC: Procedures and processes

The Intergovernmental Panel on Climate Change (IPCC) comprehensively and objectively informs policy makers worldwide on the current state of scientific knowledge about climate change. It provides reliable information for decision makers without being policy prescriptive. The IPCC itself does not carry out research, but assesses the existing works of thousands of experts worldwide in the IPCC Assessment Reports.

The IPCC's statements carry considerable weight because the unique, multi-step review process makes them balanced and comprehensive. The 195 member states endorse the scientific findings of the IPCC reports and by doing so recognize them formally.

Since summer 2010 the author teams have compiled the Fifth Assessment Report comprising several thousand pages. They have used existing scientific literature as their source. Texts that had not been peer-reviewed, for example reports from state agencies or international organisations, were checked with particular care. Contrasting views, gaps in knowledge and uncertainties are clearly presented in the report.

The report contains three parts: Working Group 1 assesses the physical science basis and future climate change. Working Group 2 analyses the risks and impacts of global warming on natural and human systems, as well as vulnerabilities and adaptation options. Working Group 3 deals with technological, economic and political options for climate change mitigation through the reduction of greenhouse gas emissions. For each of the three working groups almost 50,000 comments have been addressed.

A special focus of this report was on regional issues. Only when decision makers know about the impacts of climate change in their local environment can they assess the risks and develop strategies to adapt. Around 830 lead authors contributed to the Fifth IPCC Report, 41 of them from Germany. The authors contributed on a voluntary basis.

### Figures from the Fifth IPCC Assessment Report



## Content

The **IPCC Synthesis Report**: Challenges for research and research policy

**Page 4**

**Interview** with the Minister for Education and Research Prof. Dr. Johanna Wanka

**Page 6**

What are **Scenarios and Climate Models**? How do they work?

**Page 8**

**Society and Climate Change**: Transformation of the energy system

**Page 9**

**Risk Management and Adaptation**: Climate change in different regions

**Page 10**

**Climate Economics**: What costs are associated with climate change?

**Page 11**

All graphics in this issue can be reproduced free of charge. Please reference "Outlook Earth". A digital version of this brochure can be found here:

➤ [www.fona.de/perspektive-erde/ipcc03](http://www.fona.de/perspektive-erde/ipcc03)

### Additional links

- [www.ipcc.ch](http://www.ipcc.ch)
- [www.de-ipcc.de](http://www.de-ipcc.de)
- [www.unep.org](http://www.unep.org)
- [www.wmo.int](http://www.wmo.int)
- [www.fona.de](http://www.fona.de)
- [www.pt-dlr-klimaundumwelt.de](http://www.pt-dlr-klimaundumwelt.de)
- [www.unfccc.int](http://www.unfccc.int)



# What's Next After the 5th IPCC Synthesis

## Challenges for Research and Research Policy

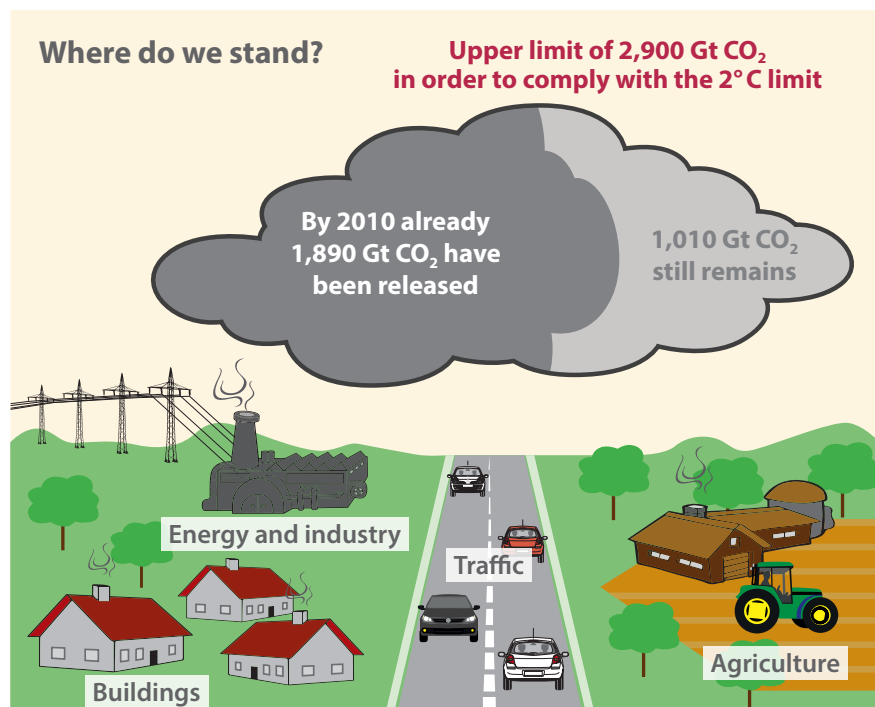
**The new IPCC Synthesis Report clearly confirms that human activities are the dominant cause of the recent climate change. The evidence for current change and its causes is much more comprehensive and sound than in the previous report of 2007, and the projections of future changes more reliable.**

These findings are based on more detailed observations, advanced models and a deeper understanding of the underlying processes. The conclusions of the report are based on more than twice as many climate models and a far larger number of individual simulations, compared to the Fourth Assessment Report.

The German Federal Ministry of Education and Research (BMBF) has made a significant contribution to this progress. Since the publication of the last IPCC report the BMBF has invested around 500 million Euros in climate research. The results have contributed directly or indirectly to the current Assessment Report.

For the first time the new report has indicated that in order to keep global average temperature rise below 2°C, the total of global CO<sub>2</sub> emissions since the beginning of industrialisation must be limited to 2,900 gigatons. This value has been recognised by the United Nations Framework Convention on Climate Change (UNFCCC) to ensure that the effects of climate change remain manageable.

Valid estimates indicate that humankind has released almost 1,900 gigatons of CO<sub>2</sub> since 1870. About half of this amount accumulated in the atmosphere contributing to the anthropogenic greenhouse effect. The other half of the CO<sub>2</sub> was absorbed by both oceans as well as soil and plants. This means that less than 1,000 gigatons of CO<sub>2</sub> remain to be



emitted, if the agreed limit is not to be exceeded. The effects of other greenhouse gases have been accounted for in this estimation.

Modern climate models and observational techniques used in climate research are highly refined and the know-how has become more sophisticated. However, there are still uncertainties and gaps in the understanding of the highly complex climate system.

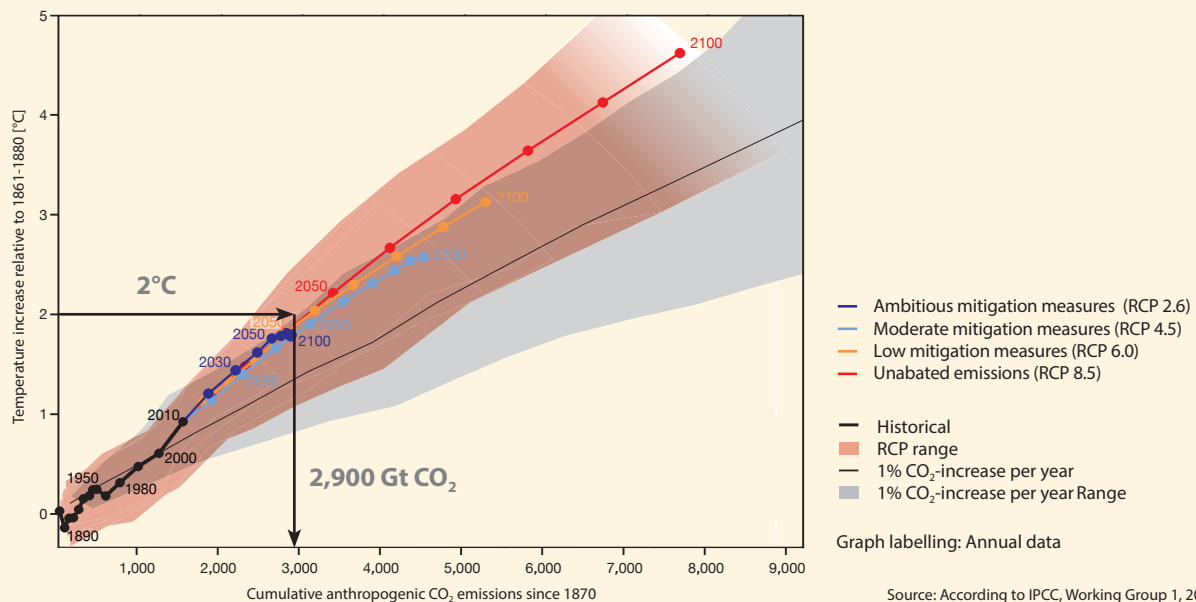
One important research question concerns the reasons for short-term variations that overlap the long-term global warming trend. For example: it is particularly important to understand why the rise of the global average temperature close to the Earth's surface has been slower in the last 15 years than in the previous decades. Short-term internal climate variability is considered one probable reason for this phenomenon, but further research is needed.

The new IPCC report indicates uncertainties and knowledge gaps. These are the issues that current BMBF research programmes address:

- Research seeking methods to adequately model short-term changes in the climate system is supported to **create medium-term climate predictions for various regions**. The aim is to create a bridge between short-term weather prediction and long-term climate change projections.
- How can greenhouse gas emissions be reduced to prevent dangerous climate change? In Germany the **transition of the energy system**, as the most important CO<sub>2</sub> emitter, is currently the most important objective. The BMBF funds research to enable the necessary innovations and support the implementation of an energy transition. This is also aimed at

# Report

## Projected emissions of CO<sub>2</sub> – emission pathways and possible increases in temperature



Source: According to IPCC, Working Group 1, 2013

creating greater transparency and stronger participation in the introduction and dissemination of new energy technologies.

- As climate change cannot be completely prevented even with a very ambitious climate protection programme, it is important to gather further knowledge on **effective adaptation measures**. This is why BMBF programmes such as **"Klimzug – Climate Change within Regions"**, are exploring ways for different regions (in this country and world-wide) to prepare for climate change and to develop their own capacity to adapt.
- It is clear that that unbridled climate change would cause significant economic costs. Investment in the prevention of global warming today will lead to cost savings in the long run. But how should this be achieved?

Work carried out by the BMBF funding priority **Economics of Climate Change** includes analysing international cooperation models, the establishment of economic calculation foundations and examining energy-economic conditions for a climate policy, in which the 2°C limit is enforced.

Precise answers and information about these research questions are important for decision makers in politics, business and society to gain a sound knowledge base and draw appropriate conclusions for dealing with global warming and its consequences.

### Contact

Gregor Laumann  
Project Management Agency  
German Aerospace Center  
+49 (0)228/3821-1523  
gregor.laumann@dlr.de

Dr. Christiane Textor  
German IPCC Coordination Office  
Project Management Agency  
German Aerospace Center  
+49 (0)228/3821-1554  
christiane.textor@dlr.de

### Links

[www.de-ipcc.de/en](http://www.de-ipcc.de/en)  
[www.ipcc.ch](http://www.ipcc.ch)



## “Climate research provides knowledge for a global climate agreement”

*Prof. Dr. Johanna Wanka,  
Federal Minister for Research*

### **The IPCC report has been published. What are the next steps?**

The priority in climate change policy is to pass a comprehensive, ambitious and binding climate treaty in Paris in the coming year. We require the ability to adapt to the already unavoidable impacts of climate change. This is particularly true for the most affected regions of the world. Research and innovation are key prerequisites for finding answers to climate change. Our climate research strategy follows the triad “Relevance – Innovation – Excellence”.

Specifically, this means: The results of climate research must be available where specific decisions have to be made. We want to support citizens in climate change mitigation and adaptation to climate change. At the same time we are tackling the climate challenge with technological and social innovations: the keyword is “Green Economy”. We need a climate-neutral economy and lifestyle. We will continue to close the gaps in our knowledge of climate change through excellent research. For example, this includes the best reconstruction of climate history possible to enable the development of climate models that can make more accurate predictions for shorter periods and narrower regions.

### **Climate change is of great importance to the safety of humankind. What does this mean for science?**

Facts that are considered certain knowledge today are the result of decades of scientific work. This is why research policy needs patience and perseverance. Today we can say: there is no longer any serious doubt that climate change is happening.

But we cannot say is: there are no more unanswered questions. Science and research are, more than ever, in demand to develop adaptation strategies, improved climate models, develop measures for climate protection and to explain short-term climatic fluctuations. We are only at the beginning of a long learning and transformation process.

### **Is there anything to indicate that the 2°C limit can still be met?**

If we act quickly and collectively, climate protection and adaptation can be affordable and the majority of climatic effects are expected to be manageable. We need profound technological, economic and institutional change. The longer we hesitate, the more difficult and expensive it will become. The IPCC report assesses the economic cost of ambitious climate protection as comparatively moderate - but only under ideal conditions. However, the core problem seems not to be the cost itself. Ambitious climate targets can only be achieved if the costs of climate change are fairly shared within the international community.

### **How can research help with this issue?**

The key is to decouple our energy supply from fossil fuels. By 2050 the portion of low-carbon energy must be greater than today by a factor of four. Energy consumption must be reduced across all sectors, energy efficiency must be increased, deforestation must be reduced and consumer behaviour altered. Our Framework Programme Research for Sustainable Development (“FONA – Research”) and the BMBF

research on global change is aimed at tackling this very problem. How can climate protection and adaptation be economically viable? What networks and storage facilities could improve energy distribution, which new materials could improve energy efficiency? How can urbanisation proceed with greater sustainability, and how can we translate this knowledge into action on the ground? The challenge to science is diverse and exciting. It requires practical and effective knowledge so that decisions can be based on a solid foundation. For this reason we work closely with municipalities and rural districts, authorities, associations, companies and ministries who have enthusiastically supported us in the formulation of our “FONA” programme.

### **What have the IPCC assessment reports achieved so far?**

Without the IPCC and climate research there would be no large transformation projects like the energy transition. Science has not only played a big part in making us recognize that climate change is a global problem, but also in revealing the root cause. The current IPCC report confirms with greater certainty than ever before that the climate is changing, and that humankind’s activities are the main reason for this change. The IPCC demonstrates ways in which the climate can be protected, methods for adaptation with which climate change can be slowed and how the threat that climate change poses can be met.

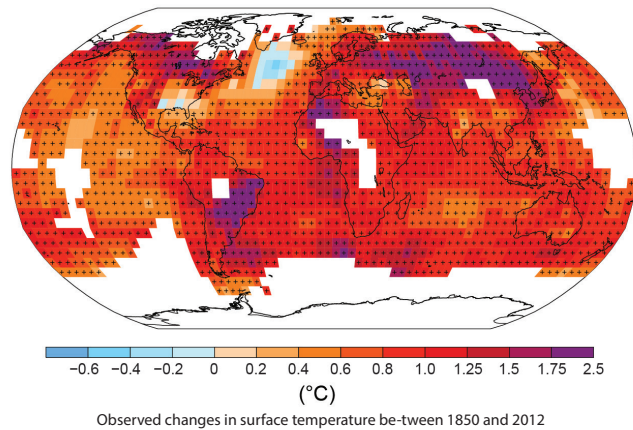
### **Many people are unsure how reliable the findings of climate research are.**

In the current IPCC report the evidence for climate change and its causes has become more comprehensive and certain that in the previous report from 2007. The changes can be observed in the climatic system and the consequences of unbridled change would be devastating in many places. The methods and the models used in climate research have been greatly improved over recent years. However, we will never be able to make predictions with one hundred percent certainty. That is also a task for science: to always critically review and question their own findings and to clearly identify any knowledge gaps.

#### Why do we need such a complicated procedure at the IPCC?

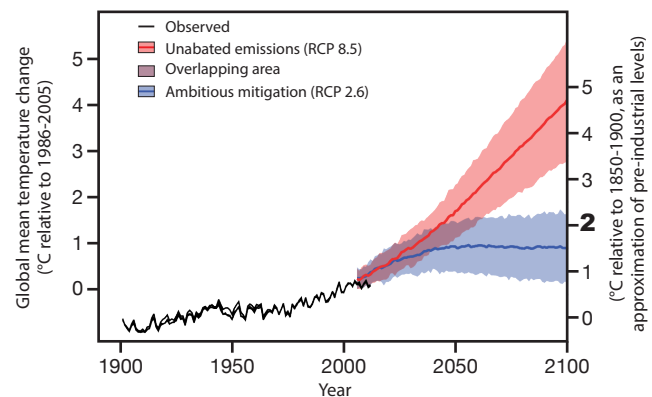
Climate research establishes the decision basis for a global agreement. It concerns wide-ranging decisions that affect all humankind. This is why the IPCC report is also adopted by the international community. It is crucial that findings made by the IPCC can be relied upon. Therefore the IPCC works according to a very detailed procedure. A multi-stage assessment process, a balanced team of authors and the involvement of thousands of experts worldwide ensure that the reports are reliable and as objective and comprehensive as possible. Precisely this demanding procedure makes the IPCC a unique and dependable instrument of scientific policy advice.

### The global mean surface temperature increased in the period 1880-2012 by 0.85 °C

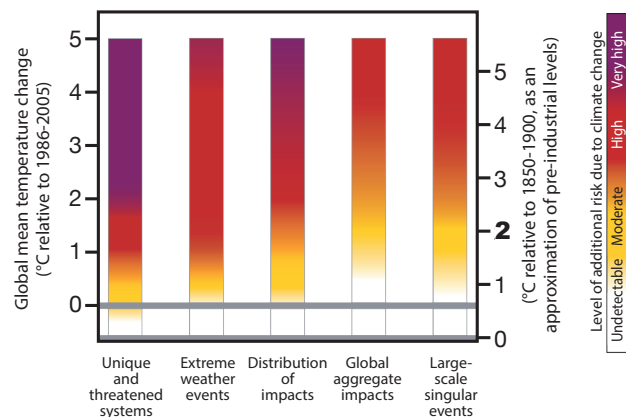


Source: According to IPCC, Working Group 1, 2013

### Development of the global average temperature in different scenarios



### Rising risks with accelerated climate change





## Scenarios and Climate Models

### How do they work?

The Fifth IPCC Assessment Report worked with climate scenarios and models, the validity of which can be difficult for the layman to understand. As nobody knows how global warming will develop in the future it is essential to create realistic scenarios, for example, how anthropogenic CO<sub>2</sub> emissions will evolve. To show what this means for the global climate they are transferred to appropriate models. Using mathematical equations and computer simulations these models calculate the highly complex climate system, its internal dynamics and the influence of external factors such as humankind in a kind of substitute reality.

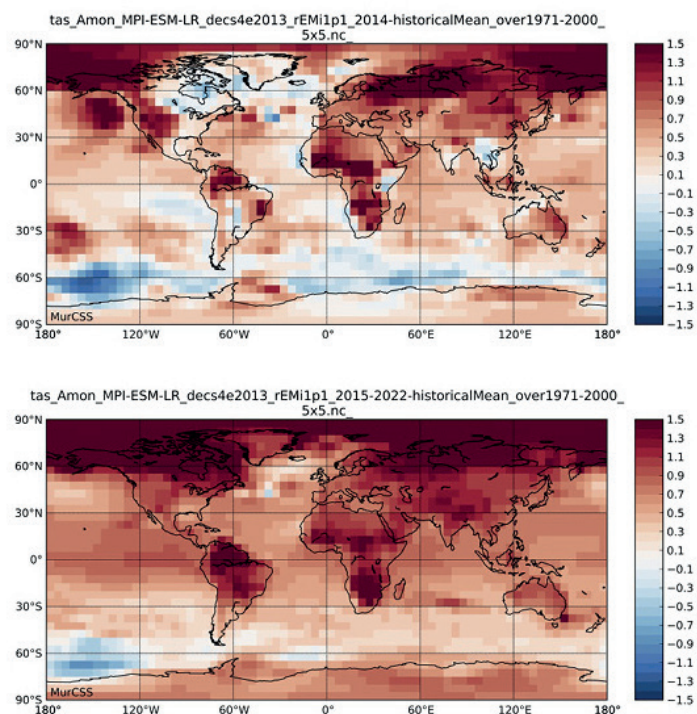
## Decadal Climate Prediction Research – MiKlip

Due to rapid advances in the development of increasingly powerful computers, climate models have continually improved and their projections have become more accurate. While even the most sophisticated of these models cannot predict future climate change perfectly, it would be highly irresponsible to ignore their predictions considering the potential consequences of continued climate change and their projected likelihood.

The IPCC reports' projections are certainly long term, looking ahead to 2100 and beyond; but what about the shorter term? How will the climate develop in the next ten years or in the years 2030 and 2040? With the funding priority "MiKlip – Medium-Term Climate Predictions" the BMBF will try to fill these gaps in the climate predictions.

MiKlip includes more than 60 individual projects. This mainly involves computer simulations based on pre-existing measurements. Europe and northern and tropical Africa serve as sample regions. Understandably, the model cannot predict what the weather will be like in a particular place in a few years time. Rather, the objective is to be able to

predict the average temperature in a specific month or the distribution of precipitation in Central Europe.



*Anomaly forecast for surface temperature. The top image shows the forecast for 2014, the image below for the average of the years 2015 to 2022.*

The major challenge is that in a forecast period spanning decades, climate change depends not only on greenhouse gas concentrations in the atmosphere introduced by humankind, but also on natural variations in the climate system. Fluctuations in solar radiation and volcanic eruptions also play a role in the internal variability of the climate system. Scientists and politicians urgently need reliable statements on climate changes that will take place within the relevant planning cycles of the coming years and decades.

### Contact

Dr. Armin Mathes  
Project Management Agency  
German Aerospace Center  
+49 (0)228/3821-1541  
armin.mathes@dlr.de

### Link

[www.fona-miklip.de/en/](http://www.fona-miklip.de/en/)



## Society and Climate Change

### How do we deal with climate change?

As climate change is caused, not least, by fossil fuel emissions, one possible answer to global warming is the transformation of energy systems. Importantly, any modern energy policy must design energy generation, distribution and use along environmentally and socially acceptable lines. The German energy transition will only be a success if the needs and expectations of the population are taken into account. As part of their social-ecological research BMBF promotes 33 research projects on the environmentally friendly and socially compatible transformation of the energy system.

## How can citizens be meaningfully involved?

**The Demoenergie Project:** Wind energy and solar projects, energy storage technologies and the expansion of the power grid not only encroach on nature, they also affect the lives of many people, who naturally want to have greater involvement in the planning of new infrastructure projects. It is also important to involve those who do not agree with the project. For some time research has focussed on the so-called NIMBY (not in my back yard) phenomenon: "Energy transition? Yes, in principle, just not in my back yard!" Concentrating on this factor alone is short-sighted and leaves out political, historical and cultural factors. To obtain varied insights the "Demoenergie" project under the direction of the Institute for Advanced Study in the Humanities – (Kulturwissenschaftliches Institut Essen) analyzed the history of local debates. The aim is to initiate a participatory process for the expansion of the power line network in Bavaria and the energy conflict regarding the introduction of a CO<sub>2</sub> storage facility in Brandenburg.

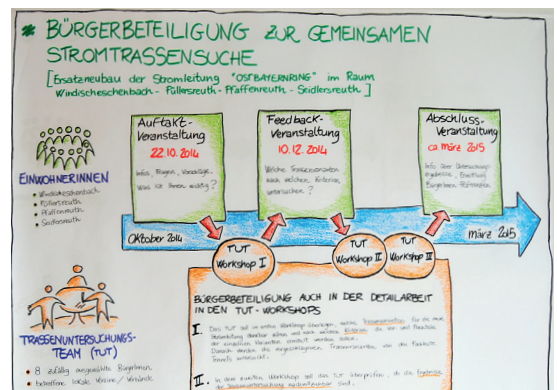
A close look is also being taken at how concerned citizens can be included in such a way that their interests are taken into account, whilst at the same time ensuring that the objectives of the energy transition are achieved efficiently. Spatial planning and approval procedures often offer little opportunity. Informal talks are all that remain. This is why the "Demoenergie" project strives to involve, use and evaluate citizens in refined dialogue-driven initiatives as part of the network expansion.

**Soko:** How fair is the energy transition? The rising cost of the energy revolution is borne mainly by private households. What is clear is: the burden is unequally distributed. The research project, "Sociopolitical Impact of the German Energy Transition" under the direction of the Centre for European Economic Research in Mannheim (ZEW - Zentrum für Europäische Wirtschaftsforschung), is examining what energy poverty means and what the distributive effects of the energy and climate policy are.

Private households are asked whether they feel the costs are fairly distributed and what this means for their acceptance of the energy policy. The actual energy consumption will also be examined



"Demoenergie" project workshop



Placard from the "Demoenergie" workshop

under various aspects: how efficiently is energy used in households of different income groups and what is the effect of the cost increase on those who receive social welfare? The results of this research should describe the relationship between energy and social policy and serve to give politicians recommendations for action.



### Contact

Michaela Thorn  
Project Management Agency  
German Aerospace Center  
+49 (0)228/3821-1538  
michaela.thorn@dlr.de

### Links

[www.fona.de/en/9883](http://www.fona.de/en/9883)  
[www.fona.de/en/15980](http://www.fona.de/en/15980)

Source: KWI

Source: KWI

## Risk Management and Adaptation

### Climate change in different regions: KLIMZUG

As climate change cannot be completely stopped, even with very ambitious climate protection efforts, the policy makers, businesses and society are faced with the task of finding suitable strategies for adaptation. The suitability of these strategies varies from region to region. The research project Klimzug-Nord focused on the specifics of Northern Germany, in particular the metropolitan region of Hamburg. The focus was on the question of what requirements must be satisfied in future urban and spatial development and what measures are required to ensure the quality of life in the region's settlements.

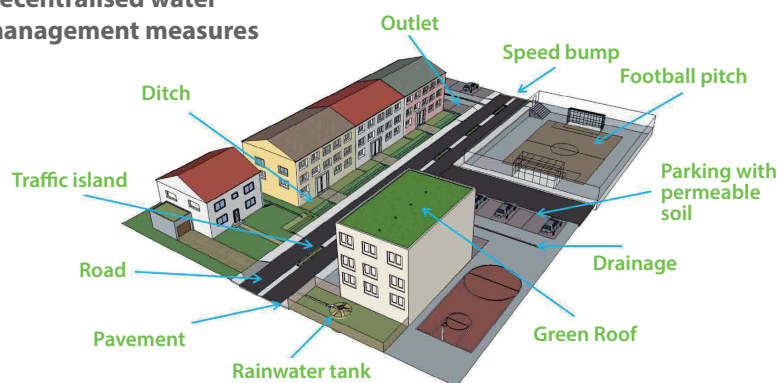
## Klimzug-Nord: Cool head, dry feet

Compared to the climate in the countryside the climate in the city can be characterised by its lower average wind speeds with increased gustiness and higher evening and night-time temperatures. City planning that purposefully reduces the differences between the city

temperature is much higher in the Elbe Valley both in the densely built-up areas and especially in the port. A Klimzug-sub-project used a dynamic statistical process to show how the intensive greening of roofs and walls in combination with the use of reflective and lighter materials for

the high degree of water tight sealing. Only a small percentage of the rain evaporates or seeps away. This means that the sewer system must take away a large part of the water. In the future, sewage systems may quickly reach their limits and overflow. This in turn increases the risk of inland flooding. Besides damaging the water industry, flooding affects buildings and infrastructures. Damage is not limited to the buildings themselves; it also impacts the contents and furnishings. If flooding makes streets and roads impassable, mobility and transport may be compromised. The problem: long depreciation periods of around 80 years make sewers and storage reservoirs an inflexible system. For this reason a sub-project recommended that storm water management be decentralised; that is, effective drainage areas should be fully or partially decoupled from the sewer system. This would effectively reduce the inflow to the sewer and water systems.

### Decentralised water management measures



Source: Kursbuch Klimaanpassung Klimzug-Nord, 2014

and countryside can, to a certain extent, counteract the negative effects of climate change. These include more frequent tropical nights and days with heavy rainfall. A guiding principle that has developed in the course of the Klimzug-Nord research project is therefore: "Cool head, dry feet".

### Lower temperatures

The average evening summer temperatures in the metropolitan area of Hamburg from 1971 to 2001 were calculated using simulations. The lowest temperatures are found in the higher-lying areas of the Hamburg hills and in the countryside to the east. The average

the construction of houses and streets could decrease the average evening temperature over a large area. This sub-project was used to give town planners firm recommendations to avoid soil sealing in order to prevent nocturnal overheating and to maintain sufficient permeation area for rainfall. To enable sufficient ventilation of fresh air, dense development with urban canyons is also to be avoided. Deciduous trees, mobile shading elements and the occasional taller building can also reduce summer heat stress.

### Channelling less rainwater

Climate change alters the distribution and intensity of precipitation. This has a number of consequences in cities due to

### Contact

Silke Kröll  
Project Management Agency  
German Aerospace Center  
+49 (0)228/3821-1598  
silke.kroell@dlr.de

### Links

[www.fona.de/en/10047](http://www.fona.de/en/10047)  
<http://tinyurl.com/ouxm8d5>



## Climate Economics

### What costs are associated with climate change?

When it comes to the economic consequences of climate change the first things that come to mind are the costs arising from extreme weather events such as storms and floods. However, in addition to the direct damage, the cost of adapting to the changing climate and the implementation of measures for climate protection must also be taken into account. So how much is climate change going to cost us? Policy-makers need reliable statements on costs to be able to assess the risks and opportunities of climate change and adaptation, especially locally in the communities and regions. For example, how high must the dikes on the North and Baltic Sea be built? How much does it cost and how expensive will it be if we do nothing?

## The first answers are given in the "Policy Dialogue on Climate Economics"

With the funding priority "Economics of Climate Change" the German Federal Ministry of Education and Research aims to be able to better estimate the costs, risks and opportunities of climate change. The results of 27 funded projects should put decisions made by governments, companies and civil society on better footing and, for example, indicate which climate protection instruments are economically viable. The projects provide answers to a wide range research questions on climate economics. To ensure the findings reach a wider audience, the the "Policy Dialogue on Climate Economics" has made communication beyond the scientific sphere a key objective.

One of the key pillars of the Dialogue will be a series of four discussion meetings,

titled "Climate-Economics Forums", scheduled from early 2015 onwards. They will tackle current issues in the climate and energy debate, present current research findings and offer a platform for discussion and informal exchange between science and practice. The series of events is aimed at a wide audience of decision makers from businesses, NGOs, authorities, and policy makers who are affected by the economic aspects of climate change. The first forum is dedicated to the topic "Cost of Climate Change, Climate Protection and Adaptation to Climate Change". In the context of the event, questions that participants consider particularly relevant and useful in practice will be explored in depth. Of particular interest are questions on the cost of climate change, specific adapta-

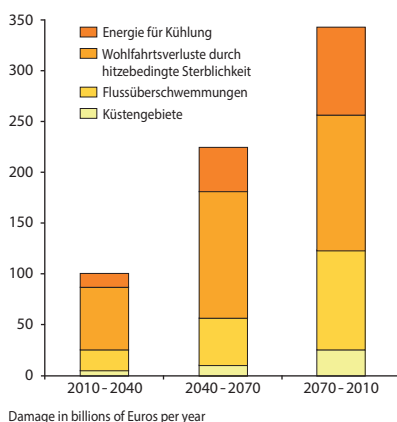
tion needs, the options available to different regions and industries, and the methods for their determination and evaluation.

Further discussions on the key topics "The Design and Effects of Climate Policy Measures and Instruments", "International Climate Negotiations and Regimes", "Energy Resources and Climate-Friendly Energy Supply", will take place in 2015. Impulses from the events will be compiled in a concise and clear form in a policy paper. They will be used to provide sound, bundled and current information that will be made available to the media, the public, businesses, politicians, administrators and scientists for further discussion.

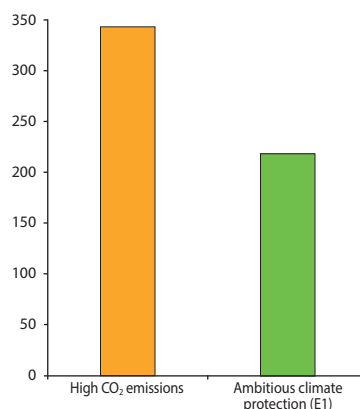


### Economic costs of climate change and socio-economic developments

Costs in a scenario with high CO<sub>2</sub> emissions



Costs according to different scenarios (2070-2100)



Source: according to EEA 2012

### Contact

Dr. Horst Steg  
Project Management Agency  
German Aerospace Center  
+49 (0)228/3821-1988  
horst.steg@dlr.de

### Links

[www.fona.de/en/9908](http://www.fona.de/en/9908)

## Dates

03.-14.12.2014   Lima, Peru	UNFCCC Climate Change Conference COP 20
19.02.2015   Berlin	Kick-Off Event "Science Year 2015 - Future City"
30.11.-11.12.2015   Paris, France	UNFCCC Climate Change Conference COP 21

### Contact at the BMBF

Dr. Gisela Helbig  
Head of Unit "Global Change"  
+49 (0)228/9957-2071

Dr. Volkmar Dietz  
Head of Unit "Fundamental issues  
of sustainability, climate, energy"  
+49 (0)228/9957-3445

SPONSORED BY THE



Federal Ministry  
of Education  
and Research

### Press contact at Project Management Agency

Marina Rižovski-Jansen  
Environment, culture, sustainability  
+49 (0)228/3821-1569  
marina.rizovski-jansen@dlr.de



**FONA**  
Research for Sustainable  
Development  
BMBF

## Imprint

### Published by

German Aerospace Center  
Project Management Agency  
Environment, Culture, Sustainability  
Heinrich-Konen-Str. 1, 53227 Bonn/Germany  
+49 (0)228/3821-1511  
www.pt-dlr.de

### Person responsible according to German Press Law

Dr. Martin Rieland

VDI Technologiezentrum GmbH  
Innovationsbegleitung und Innovationsberatung  
VDI-Platz 1, 40468 Düsseldorf/Germany  
+49 (0)211/6214-536  
www.vditz-ibb.de  
ibb@vdi.de

### Editor

Wolf-Dieter Rühl

### Publisher

Verlag Rommerskirchen GmbH & Co. KG  
Mainzer Straße 16-18, Rolandshof  
53424 Remagen/Germany  
+49 (0)2228/931-0  
www.rommerskirchen.com

### Printed by

M&E Druckhaus GmbH & Co. KG  
Weberstr. 7, 49191 Belm/Germany

