

# Climate Change Challenges and Problems

## Introductory statement of a panel discussion

Climate change is a *problem related to geophysical dynamics*, namely that a change of the chemical composition of the atmosphere causes a change of the weather statistics, which represents a *major political challenge*, namely the need to decide of how we deal with the perspective of in this way induced man-made climate change.

But climate change is more in the political arena – it is **C**limate **C**hange with capital C's. CC has become the major battle-cry in a conflict about how “we” should live, oriented along the paradigms of “sustainability” or of “freedom of individual”. In one extreme, social actors claim the impending catastrophe, which will make the world inhabitable as we know it, if we do not implement a stringent top-down transformation of the society, whereas the other extreme considers the science fundamentally flawed, that nothing of significance will happen, and that all efforts for purportedly “saving climate” are merely done for achieving a socialist-like world-government.

Maybe, this aspect of climate change is the most challenging, because it has two side effects, namely that the issue of climate change itself fades into the background, is no longer taken seriously as such, and the political decision process is framed as if all decisions would immediately follow from scientific facts.

What can “we” do? Who are “we”?

When “we” are climate scientists, I suggest doing the following:

- a) Do not claim that we know what “must” be done politically.
- b) Recognize that our knowledge is deep and narrow, even if we operate in an interdisciplinary set-up.
- c) Participate in the public debate as citizen, without claiming a privileged role derived from superior knowledge of “truth”.

Such a self-limitation of scientists serves two purposes, namely to maintain the social role of science in allowing “sense-making” for society, and to allow the

democratic process to evolve as a negotiating process between groups with different values and preferences.

But what are the scientific challenges, we as a scientific community face? Let us begin with **natural sciences**. The list is long, and I want to list just a few:

- a) Recognize that the “science” is not settled, but that certain issues are nowadays no longer really contested, such as that elevated greenhouse gas concentrations go along with changes in the thermal regime. We are able to describe this link rather well, we believe, and the construction of scenarios of changing weather statistics, at the global and regional level, is no longer a challenge but a routine task.
- b) Identify those issues which have not been addressed properly, and those, which are contested. Among these are the failure of contemporary scenarios to describe the “hiatus” of an extended period of little warming, the contributions to ongoing and future change of sea level, the change of tropical cyclones, the role of aerosols.
- c) Apart of these issues there are some long-standing open questions, namely how the sensitivity of the climate system will change when the modelled oceans are no longer filled by mustard but with water; and how accurate the complex of radiation and clouds is described in our models.
- d) A key approach in climate change science is “detection and attribution”, which is designed to first determine if an ongoing change is beyond the range of natural variations, and second identify the mix of drivers which this change may most plausibly be attributed to. This concept is well established in global analysis, but rarely seen in regional studies. One reason is that other drivers are present in regional set-ups, in particular regional aerosol presence and land-use change (including urbanization). Europe has seen both a massive increase in global greenhouse gas concentrations, and a strong built-up and later reduction of regional aerosols. We need to disentangle these effects.

There are also many tasks for social and cultural sciences, dealing with both the functioning of natural sciences, societal constructions of the problem, the political framing.

- a) The concepts of mitigation and adaptation, with the more recent and rather belated insight that the dominant managerial issue on regional and local scales is adaptation.
- b) The role of the catastrophe rhetoric, and the function of the 2° goal in gaining and losing public attention.
- c) The logic of skeptics and alarmists that science is decisive in defining policies; that policymaking is merely implementing scientific insight.

**In summary:**

- **Send scientists back from the public market squares into their laboratories and let them construct knowledge and options of how to deal with problems**
- **Have them participating in the public decision process by presenting this knowledge and options, but otherwise as everybody else.**
- **Frame climate change as a political problem.**
- **Deal with climate change, not with Climate Change**