

CLIMATE SCIENCE IN SOCIETY

The situation is post-normal

The situation is as follows: Man-made climate change is real, but we are still arguing what it really consists in and how to go about it. There is no doubt that the continued emissions of carbon dioxide and other gases first increase the concentration of those gases in the atmosphere and secondly lead to an ongoing rise of the air temperature. Restricting emissions will reduce or slow down future climate change. Although everybody agrees that the ever-increasing man-made discharge of greenhouse gases into the atmosphere have changed the weather statistics, i.e. the climate, it is not at all clear to what extent this is happening and what exactly the future holds. Whether a doubling of carbon dioxide concentrations will increase the equilibrium temperature by 2 degrees or by 4 degrees, how the ice caps of Antarctica and Greenland are currently changing and will be changing in the future, whether and how the distribution of tropical cyclones will change - those are contentious scientific questions. **Knowledge is inherently uncertain** - not because science is incapable, but because we are still lacking sufficient empirical evidence. There are no well-documented analogues and the effect of the additional greenhouse gases has lasted for a relatively short time. It is quite clear, however, that the process on the time scale of human experience is slow, and that decisions on more or less emissions will be effective in the long run only. Insofar **decisions are urgent indeed** - they have to be made now, even if they will not have any noticeable effect until in a few decades.

Decisions on emissions are decisions on investment, technologic development, lifestyles, power. In this regard, various social stakeholders have **different interests**, often linked to economic power and power of interpretation. And finally, those decisions are being made in different cultural worlds of interpretation. They are determined by different ways to assess risks, by various definitions of quality of life and by **different systems of values**. In a nutshell: **Knowledge is inherently uncertain, decisions are urgently required and affect different interests and different values**. A situation like that is generally referred to as post-normal. A typical aspect of such a situation is that it brings about a competitive situation into the market of knowledge claims.

A reader of our "Klimazwiebel" weblog has expressed it as follows: *"From the Theoreticum of "postmodernism" which has been in use for several decades, a change towards private life, rather than towards citizenship is happening now. In practice it is a matter of fact now that people -completely in the sense of postmodernism - are picking the kind of information they like best. Their slogan seems to be: "To me the truth is what I believe to be true."*

Cultural Constructions

It is no more science alone that - using its scientific constructions or interpretations - explains the situation. Science has come under pressure by **cultural constructions** that represent different value systems and world views, such as religious beliefs, conceptions of determination, revenge, justice, punishment and redemption. Nature strikes back, punishing society for sinning against it. Extreme events of all kinds are exhortations to repentance, reformation, and finally redemption.

In North America they more often refer to the divine determination to dominate the Earth, whereas extreme events are rather perceived as a personal challenge. In other places too, the so-called skeptics see the story of the so-called climatic disaster as a means to control the masses, perhaps even as "opium for the people" to protect the power of the élite. Generally speaking, scientific knowledge is always said to be close to power, and therefore often also causes distrust.

Naturally, scientific and cultural constructions interact with each other. What is culturally true is more likely to be scientifically confirmed than what is not; the cultural model incorporates variants of the scientific construction. But, as a reader of the aforementioned Klimazwiebel astutely noted: it is like with Heisenberg's uncertainty relation principle, according to which "the momentum of an event is changed by observation."

Science and Policy

The situation is post-normal, and apparently scientific understanding is not enough to launch an effective climate change policy. **Should it do so at all? Should scientific understanding alone be enough to define policy?**

I personally prefer a policy that seeks information at the factual level of science regarding opportunities, implications and options, but ultimately makes political decisions - i.e. **a scientifically informed but value-based and socially-culturally consistent** policy. However, in post-normal situations we see that science or, more accurately, scientists are trying to dictate policy.

This is precisely what we are currently doing, when scientists and politicians claim or at least suggest, "science" had shown in the form of the Intergovernmental Panel on Climate Change, IPCC, or the Scientific Advisory Council of the German Federal Government on Global Development, WBGU, that the 2-degree target is scientifically a must and therefore no more a political issue to be negotiated at the level of society, but a goal just to be executed by policymakers

The IPCC by no means presented the 2-degree target as being mandatory, in fact it were some scientists, or should I say politicians masquerading as scientists who did so. In a Spiegel interview with such a climate scientist one could read something like the following in summer 2010: *"First of all, what's hubristic here is the way we are unscrupulously interfering with creation by burning all the fossil fuels. And of course the world won't end if temperatures go up by 2.01 degrees, let alone end suddenly. From today's scientific perspective, we could possibly live with a warming of two to three degrees"....* And when answering the question regarding 2 degrees target as the "magic limit": *"Politicians like to have clear targets, and a simple number is easier to handle than a complex temperature range. Besides, it was important to introduce a quantitative orientation in the first place, which the 1992 Framework Convention on Climate Change managed to elegantly wangle its way out of. And let's be honest: Even if we aim for the two-degree target, we'll end up somewhat higher. Whenever there's a speed limit, most drivers tend to go a little faster."*

Let us recall that those are statements of a scientist, of whom many people think and who also pretends by his gesture, that he does not express his personal opinion but the objective truth. Although the latter does not exist in reality, it certainly does in the virtual reality of society.

The practical cynicism expressed in the quote quite clearly demonstrates the claim that it is science or, more precisely, some scientists who tell us which way to go, possibly in

a somewhat popularized way for slow-witted politicians and a stupid electorate. Science practiced in this sense does not engage in enlightenment, but further entrenches power relationships!

Copenhagen and the following conferences

It does not come as a surprise that this does not work in real world. China and India will be as reluctant to give up their development objectives as the United States will be in giving up their perceived security by allowing personal firearms, or German motorists who like speeding or doing at least a few extra miles per hour.

Copenhagen or COP-15, to be precise, had to fail exactly because of those exaggerated ambitions; Cancun and Durban had almost no effect except the re-agreed declaration that the matter, namely the man-made climate change is a serious one. It also became clear, however, that the **one ideal way** - often shortly described as Kyoto - is not really available, so that other additional ways will have to be explored instead. Climate change does not require just one but a multitude of regionally adapted options combined in a network.

I had been invited to participate in the next IPCC report, where one focus will be on the prospects and possibilities of **adaptation strategies**. When I urged politicians and scientists to consider the additional perspective of adaptation as another option in a detailed interview I gave the Spiegel magazine in 2003, I even was accused of being a defeatist. So there is pragmatic progress. The climate issue does not only require to cut emissions but in particular to adapt ourselves to what is temporarily inevitable.

Sustainability of Climate Communication

Our climate alarmists seem unable to resist the temptation to interpret every extreme event as a sign of the climate disaster. They do not understand that such excesses thwart a sustainable solution-oriented approach to man-made climate change. Thus, the public debate is reduced to the absurd choice of whether it is the climate catastrophe or the climate lie. The alarmists generate and need climate skeptics who in turn need the alarmists, just as warring twins who cannot live without each other.

By the way, I don't mind **skeptics**. There are many of them, not so many among climate researchers though, but quite a lot among other academics, often highly educated people, professors, who certainly cannot be arrogantly suspected of having

been brainwashed or bribed by the oil and coal industry. They rather have reservations, because they perceive the prevailing communication as a propaganda exercise which does not answer their questions. Such as that professor of theoretical physics, who raised doubts concerning the presentation of radiation processes in climate models and told me he had become a skeptic after listening to a lecture by a renowned climate scientist, who first obviously was not very knowledgeable about the subject and secondly did not take his audience of physicists seriously. I am not saying that we really have a problem in implementing radiation physics in our climate models, but I do think there is a lack of communication.

Skeptics are an asset because they bring about unrest, provoke the mainstream and force people to face inquiry, inquiry beyond their own group. This is how it should be at least, but it is not like that. Skeptics are rather regarded as being either stupid or evil. Skeptical inquiry - a basic virtue in any science - is not really presentable when it comes to climate science.

It is upon us, the scientific players, to make communication **sustainable**, i.e. in such a way that my present Ph.D. students will still be asked to interpret climate dynamics and climate statistics in 20 years from now. Isn't it amazing that precisely the representatives of those disciplines where the word sustainability is used so happily and frequently, forget about thinking of whether or not their own practice is sustainable?

I just addressed the suspicion that skeptics might have been bribed by coal and oil tycoons or other evil powers and consequently, the IPCC's Working Group 2 is asking its participants whether they had any conflict of interest which essentially would be documented by a financial dependency. Oddly enough, it does not even occur to them that some scientists may also be dependent on the recognition by environmental organizations, political ideologies or media attention, rather than on money.

Reign of Experts vs. Scientific Approach

Many scientists do not see themselves as detached observers of events but as being responsible for the climate, having to ensure that climate is protected and even saved. Some skeptics, however consider it their duty to prevent the society from implementing certain political measures - this way either side is purposefully instrumentalizing

science. Science is being politicized, thus becoming subject to political usefulness - something that is to be expected in a post-normal situation.

So the actual problem remains unsolved - namely, that climate is changing due to human emissions - although not with dramatic tipping points and the intensification of all extreme events, as some people are claiming for the present already - but even today many parameters that are directly dependent on air temperature are changing, and probably a lot more will do so in future.

The problem for me as a scientist is that when it comes to climate change research the role and function of science as a social service provider has been damaged. I recall Robert Merton, the philosopher of science, who perhaps naively formulated the principles of good science: communalism of knowledge, disinterestedness, universalism and organized skepticism. In climate science those principles are not always prevailing, instead they are often pushed to the background by political usefulness. ClimateGate exposed a dominant trend towards alarmism. The IPCC, however, just refers to "policy-neutral but policy-relevant".

What we need is a new or a renewed agreement on the role science shall play in society. Society must interfere and claim political decision making for itself, this seems to be the only way to constructively deal with the post-normal situation.

The prevailing model should not be the one of the Teflon-pan, according to which the promotion of many smart people often produces excellent and very useful results, but the model of cultural achievement which allows for orientation, interpretation, and thus self-determination and quality of life in a complex world. Instead of resorting to a reign of experts over the stupid people, we had better make a deeply democratic approach. This alone will result in a policy that is scientifically informed about options and implications, and makes its decisions on the basis of social values and cultural framework conditions.

This is the kind of freedom that can help science to have a sustainable impact on development.