Scientific Report
Short time travel grant of Harald Stelzer in Zurich
(Dec 5 to Dec 12, 2012)

1. Purpose of the visit

The purpose of the visit was to work on the joint paper: *Is stratospheric aerosol injection maybe the lesser evil after all? How multi-dimensional consequentialism can deal with climate-engineering.*
Furthermore, the visit was placed in the time of a conference on Risk and Acceptability at the University of Zurich (Dec 7 and 8, 2012). Papers were presented by Gregor Betz, Sven Ove Hansson Martin Peterson, Christian Seidel Matthew Rendall, Matthew Adler, Klaus Steigleder, Dominic Roser. (Progam is attached). This workshop was of foremost importance for the development of the paper, as it covered many topics that are reflected in it. It also gave the opportunity to discuss questions of the paper with world leading researchers in the field. Especially important was the discussion on consequentialism and rights-based approaches concerning risk imposition during the conference, creating many new ideas to be followed in the further development of the paper. Fabian Schuppert (one of the organizers of the conference) and Harald Stelzer both commented on papers.
The visitor also gave a talk at the Centre for Ethics of the University of Zurich (Dec 6, 2012) on the outline of a Problem Solving Ethics. Also these discussions were very helpful for the development of this idea of the visitor.

2. Description of the work carried out during the visit;

Work concentrated on the outline of the paper. Work was divided between the discussions on how to approach the topic, the formulation and reformulation of the main research questions of the paper and underlying assumptions, discussion of these issues during and after the conference with other experts, searching, selecting and reading important parts of the literature of relevance for the paper, writing and rewriting first parts of the paper.

3. Description of the main results obtained;

The paper starts from the wildly hold opinion that consequentialism is ill equipped to deal with uncertainties and risks, which are main aspects of climate change and even more so of geoengineering (GE). Consequentialism shares this problem with other utility based approaches in climate economics like integrated assessment models (IAMs) and/or cost-benefit analysis (CBA). CBA holds, among other things, that all possible significant consequences could be enumerated in advance and that probability, cost and benefit values can be attributed to them. Also IAMs are based on the expected utility framework and assume that a social planer chooses an optimal policy to maximize the discounted stream of benefits and costs over long periods of time. But if future impacts are discounted at relatively high rates, if the benefits of mitigation are evaluated based on incomplete information or speculative judgments (e.g. for the value of a human life), and if the costs of mitigation do not properly account for technological change, results from IAMs cannot properly deliver optimal decisions nor “true” benefits and costs of climate policy. To bypass some of these

problems different other models have been used, like cost effectiveness analysis (CEA). CEA stipulates a predetermined policy target, such as the +2°C target put forward by the European Union, is sought to be achieved at minimal cost or at minimum welfare loss. Replacing CBA with CEA can be interpreted as one possible implementation of the precautionary principle if damages are subject to Knightian uncertainty. However, applying CEA to a decision under uncertainty may also lead to inconsistencies. Other approaches call for “robust decision making” where strategies are selected which, for example, perform well under different potential developments. These rules are generically based on a mix of deterministic (in particular the maximin-, maximax-, or minimum regret-) and probabilistic rules. However, this field of research is rather young and the potential for generating new types of counter-intuitive results is high.

Based on the underlying uncertainties, also from a normative perspective there seems to be no straight forward answer to the question of how to take possible consequences of GE into account and how to compare them to possible consequences induced by climate change. While consequentialist seem to converge with most of normative theory that for now what we should do is to mitigate and adapt, and to consider geoengineering as nothing else then a last resort or a means to buy time, easy answers of how to evaluate GE options in lesser evil situations seem to vanish in the mist of uncertainty.

The main research question of the paper can be stated as follows: How to think normatively about GE in situations in which we find ourselves confronted with catastrophic impacts of climate change locally or global, or the threat of crossing a major tipping point?

Many have turned their back on consequentialism and questions of lesser evil, outright condemning GE as hybris and focusing on the causes that may eventually lead to such lesser evil situations. Even though we find some of these accounts of foremost interest, we would like to take a different path and return to the issue of lesser evil situations from a consequentialist viewpoint.

To answer lesser evil questions in the case of GE from a conesquentialist point of view, we need to develop a form multi-dimensional consequentialism, able to deal with uncertainties and the imposition of risks of harms. In the paper we will outline such a position and focus on the poster-child of recent debates, namely stratospheric aerosol injection (SAI). As our argument will show, consequentialist do in fact face serious problems when it comes to navigating their way between possible (negative) outcomes. However, employing a multi-dimensional form of consequentialism which takes uncertainties and risks into the equation, allows us to carefully weigh different policy options without necessarily falling into the trap of short term thinking or subscribing to moral hazard. Thus, as we will argue in the paper, consequentialists have good reasons to support GE research efforts but to be sceptical of overly hasty SAI deployment.

4. Future collaboration with host institution (if applicable)

The Centre for Ethics at the University of Zurich already has collaborated with the University of Graz. Dominic Roser (also a member of the ESF network) has been working have time for the University of Graz and the Centre for Ethics. Collaboration can be expected to continue over the next years. Also at the conference seven members of the ESF network (Martin Peterson, Christian Seidel, Klaus Steigleder, Dominic Roser, Ivo Wallimann, Harald Stelzer and Fabian Schuppert) participated.

5. Projected publications / articles resulting or to result from the grant

Fabian Shuppert and Harald Stelzer are going to continue to work on the paper, and will meet in Berlin at the End of January 2013. The paper was accepted at the ECPR Joint Sessions, Mainz 2013 – Panel: Climate Change 2.0? Normative and Political Issues of Geoengineering the Climate. We plan to publish the paper in a high ranked peer review journal and will keep ESF informed on the progress.

6. Other comments (if any).

As prices are very high in Zurich, the amount of the travel grant was not enough to cover all the expenses. The visitor wants to thank the Centre of Ethics at the University of Zurich to cover the rest of the hotel costs. For certain countries the travel grand should be adjusted to the living costs.