Climate scientist Thomas Stocker confronts the question: Is climate change a curse or opportunity?

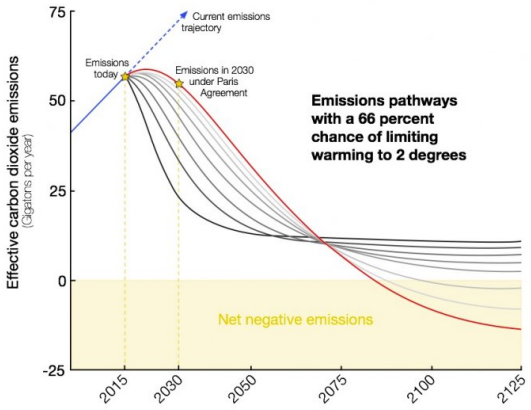
"There is no other option than to be optimistic, but with a pro-active optimism, an optimism that generates motivation to do something," insists Thomas Stocker, renowned Professor of Climate and Environmental Physics at the University of Bern, Switzerland, and past Co-Chair of Working Group 1 for the 5th Assessment Report (2013) of the Intergovernmental Panel on Climate Change (IPCC). He recently gave a Distinguished Lecture at IPRC, presenting his views on the current state of the climate and where the world might head from here.

Stocker is an earnest and inspirational speaker, with a rare perspective on the state of climate change and the challenge of coping with it. He spent years producing climate models of past and future conditions, and teasing out greenhouse gas levels from Antarctic ice cores, in an effort to extend our baseline information back 800,000 years. But then he pivoted to other important work with the IPCC, compiling 7500 pages of scientific knowledge from modeling and observational research conducted by scientists from across the world, about all aspects of the climate. The report became an invaluable snapshot of our understanding of the state of our world, and, as such, a critical document (in a brilliantly summarized form) in the battle to convince world leaders of the task at hand: a complete rethinking of how we generate and use energy, without a loss of progress. In fact, in an eloquent introduction for Stocker's lecture, Axel Timmermann of IPRC thanked him for "changing the path of our species" by helping, with the influence of AR5, to make the COP21 meeting (December 2015) of world leaders so successful.

"To me, the most surprising thing was that when we published the 5th Assessment Report…there was not a big discussion and uproar from the climate skeptics. In fact, it was surprisingly quiet, indicating to me that we really delivered a report that was extremely robust and well-prepared by the scientists," commented Stocker. "We did an unprecedently careful job in trying to anticipate what could be stumbling blocks or difficult issues that people may misinterpret or not understand."

The anticipated effects—some of which are becoming apparent already—of unmitigated climate change are familiar at this point: ice cap and glacial melt, sea level rise with resulting coastal inundation and groundwater salinization, changes in freshwater availability as rain bands shift, increases in extreme weather phenomena, ocean acidification, etc. But how much time is there before mitigation is impossible and only adaptation remains? Stocker presented the ticking clock not so much as a fixed date, but as a moving target based on the chosen limit to a temperature increase generated by

carbon dioxide emissions. For example, to hold the temperature increase to only 2° C, only 195 billion tons of carbon can be emitted into the atmosphere from today into the future. At the current rate of about 10.9 billion tons released annually, that budget will be used up by 2035. If reductions in the emission rate are made sooner, smaller reduction rates are needed to keep the temperature increase at ≤ 2° C. The longer the wait, the more drastic the yearly reductions necessary to limit the temperature rise. But at some time in the near future, the door closes.



Graphic illustrating the challenge before us: limiting emissions enough through time to keep the global temperature increase to 2°C. Credit: NCAR/UCAR

Stocker argues that we must push forward soon with a new decarbonized framework of products, professions, and values, "at the scale of an industrial revolution." He urges that "it doesn't suffice to make the cars a little bit smaller, or save another 10% of the fuel…Really think about how we can transform our infrastructure of energy supply, how we organize our lives in a way that is sustainable…We have to come up with something new."

However, in this new world, it is not a question of giving up our standard of living, but approaching life differently, Stocker emphasizes. "I personally don't see a reduction in value or joy of lifestyle in using much smarter technology than we currently have available. Here is the opportunity, that we are going to create new jobs, we are going to invent new products…that provide the same service in a much smarter way, a much better way, in a much more sustainable way."

The climate clock is ticking, but we must remain optimistic. Stocker maintains that "optimism derives from the scientific evidence that tells us we *can* do something today, we *are* able to limit the warming, if we reduce the emissions. That's the scientific evidence." The scientific community, with leaders like Thomas Stocker, is filling in the climate picture with unprecedented detail, and we must not ignore the opportunity it shows us, the possibility of a new and better world.