Russian Roulette Odds … If We're Lucky

In Potsdam, outside Berlin, one of the world's leading climate change researchers is calculating what we may expect will happen. He's not sure we are going to make it. Humanity, that is.

Climate Change Impact
By Christoffer Zieler

The Telegrafenberg in Potsdam outside Berlin is dotted with charming little domes and knobbly 19th century brick buildings surrounded by trees and patches of frozen snow. One building houses the Great Refraction Telescope installed by the 99 Days Kaiser, and behind a hillock the Einstein Tower pokes out of the ground like a dwelling for functionalist smurfs.

Professor Schellnhuber is a perfect fit for the site. Dressed in black and vaguely monkish in appearance he bears a slight resemblance to Yip Man, the Wing Chun martial arts master and teacher of Bruce Lee. And when it comes to climate impact knowledge, Schellnhuber does, in fact, hold a grand masterly status within the scientific realm. The Potsdam Institute for Climate Impact Research, which he heads, is hugely respected across the globe, and come December he will travel to Denmark as a member of the German delegation hopefully to persuade his Chancellor and all her colleagues that it's high time the world's powerful got to work on the industrialized nations' leaky radiator. Before that, in March, Schellnhuber will be a key speaker at the preparatory scientific conference hosted by the University of Copenhagen.

Hans Joachim Schellnhuber grew up in beautiful Bavaria, but it was mathematical physics rather than mountains and trees that turned his interest to environmental research. In the early 1980s he worked in Santa Barbara, California on the most fashionable physical paradigm of the time, chaos science, or complex systems theory.

»If you look at a river plane from above you see very beautiful fractal geometry, a big channel branching upstream into smaller channels that again branch out. You can apply fractal geometry to that. So that was the bridge. I was in a sense softly sucked into this interdisciplinary community, but it was purely scientific curiosity that led me to be interested in the environment.«

Schellnhuber's research made him relevant to the German government when it decided to explore – this was back in the heady future-aware days following the fall of the Wall – what the world might expect from the still rather poorly understood phenomenon of climate change.

»I hadn't given much thought to climate change then, but as I *did* think about it I discovered it was a very nice intellectual challenge. If the sea becomes two degrees warmer the coastline pushes forward which means you will have increased precipitation, heat waves in summer – the question of what would happen contains lots of food for research.«

Ruins on Telegraph Hill

In 1991 the programme was expanded into a proper institute dedicated to climate impact research. »The idea was visionary, because at that time most people thought: *global warming – so what?* So to found an institute not only for climate research but in order to study the impact of manmade global warming was to assume that the issue was real, and that it would take research to figure out what to do about it. It was probably ten years ahead of its time. And I realized that here was a huge opportunity. Being founding director meant getting a budget to hire 50 people or so, as well as a place to work. They said, 'here is the Telegraph Hill – you see all the ramshackle buildings?'«

»After the wall had come down people had rediscovered this wonderful campus. The idea was: we've got this great theme, a theme for the future, we have a fantastic historical campus, and we've got this rising star of physics to head it – now we expect you to create a fantastic programme. It must be a success! Ha! It could have failed completely, of course. To begin with, it could have turned out that global warming was no threat at all – just look at the climate reports from that time. Back then it was somewhat in the fog.«

»Now we have 200 researchers from different fields working just on this issue of climate change impact, and that's in affiliation with several universities. All of my department heads are jointly appointed as professors here in the region. But we have our own budget here and a lot of freedom. At least here in Germany we are a symbol of cross-disciplinary work. Applying good science to relevant issues – understanding the problems of the 21st century.«

So you got this place by the politicians, only later to have to be the one to whisper in your chancellor's ear – or shout as the case might be – that there was a real problem.

»Well, you don't really need to whisper humbly, because Angela Merkel is a trained scientist, she holds a Ph.D. in theoretical physics. She was ready to listen 15 years ago. But, yes, we have come full circle, providing advice to the government. The initial idea, I believe, was that this institute would become 'policy relevant', but my strategy was different: We didn't want to be another think tank or an environmental pressure group. We had to find our place in the scientific community first. Not until you have built up professional credibility, are you entitled to give advice. I am sure Angela Merkel would not have picked me as scientific advisor if we had a dubious reputation and were just known for aggressively pushing our views.«

So are you activists now?

»No. All this is still about providing scientific evidence. But what we can do is to say – given certain political goals – what you need to do to reach them. If you want to limit global warming to two degrees, we can tell you how you need to produce your energy in the future. The right mix of solar, wind, coal …«

Nuclear?

Sighs. »The Germans hate nuclear energy. As a physicist I think the risks are exaggerated, but all the same, the problems of disposal and proliferation have not been solved anywhere in the world. We try to be objective, and so we include nuclear

in our models. Interestingly, it turns out that for purely economic reasons renewables are a much better option in the longer run. People think of renewable energy as just an ideological thing, but the sober economic analysis shows something else.«

Scary Stories for Political Children

»I can tell the Chancellor what the world will look like to the best of my knowledge, if global warming exceeds two degrees. And if you warm the world by five degrees I can tell you what's likely to happen. But I never tell anyone we *must* stick to the two degrees. That's society's decision. So in a sense we are just playing out scenarios, tales about the future. But in an informed way. We take the politicians by the hand and introduce them to our fairy tale world of tomorrow.«

Your dystopia, maybe?

»Precisely, these are not just fairy tales, these are potential futures that mankind may endure or, actually, succumb to. I personally don't think we can sustain a higher form of civilization with ten billion people in a world that is warmer by five degrees. There won't be enough food and water. But anyway! We tell educated stories about possible futures. And this needs to be done in Copenhagen in March, where I will probably take on the issue of global land use strategies – how many people can this planet carry, if we manage it properly?«

»At the conference in Copenhagen in December the political leaders will have to strike a deal. The decisions will be based on ethics, values, greed, profit, what have you. All the dirty games will be played, but good things will happen too, because of people who love their children and want to preserve the world for them. It will be a political bazaar. But Copenhagen One, if I may call it that, in March, is supposed to provide the evidence so that people won't clash in ignorance but in full awareness of the risks and challenges.«

Like grown-ups.

»Well, we will try to offer some education to the people. Anders Fogh Rasmussen will be one of the speakers in the final session, and hopefully he will appreciate the evidence. Dear politicians, here are the lessons you need to learn if you want to behave like grown-ups. Whether in the end they will behave as such I cannot influence.«

»We were all surprised that Denmark became the venue for the attempt to solve the problem of climate change in 2009. We knew that your government was not so very worried about the environment and climate change. But it seems to have changed a bit now. If the eyes of the world are directed on you, you have to deal differently. Climate Minister Connie Hedegaard appears to be a serious person. In a sense your government is reinventing itself for the December conference and that's a good thing.«

Are you an optimist then?

It's the kind of question you ask rhetorically. People are invariably optimistic. But Professor Schellnhuber frowns.

»It’s difficult to make predictions. I haven’t the slightest idea what will happen in Copenhagen in the end. Probably, we will see some progress – simply because we have Obama in the world now and the Americans have changed their stance – but it won’t be sufficient in itself.«

»I just calculated something two days ago. If you assume that the EU’s two degrees target for limiting global warming is a reasonable one – do you know what Russian roulette is?«

»Right, so you have your six-shooter revolver with just one bullet in the rotating cylinder. You turn the chamber at random, put the gun to your head, and pull the trigger. There’s a 5 to 6 probability you’ll survive playing that game. Once, at least.« Schellnhuber spins the imaginary cylinders in his imaginary gun.

Those are good odds. Until, maybe, the gun was there on the table and you actually had to play in a Deerhunter kind of situation …

»Exactly, that’s the point. If I give you a revolver now with those odds you’d think twice before playing. 5 to 6 is not a really brilliant chance for survival, really. Well, we calculated the Russian roulette chance for keeping global warming to sub-dangerous levels. It turns out that this requires us to reduce global emissions by 80 per cent by 2050 - relative to 1990, not 2000! That’s if we want to play with Russian roulette odds.
If you translate this for the industrialized nations it means 90-95 reductions, that is, more or less complete de-carbonization by the middle of the century.«

»The good news is we can achieve these goals with one or two percent of GDP input. Not too much. But you need to instigate the big changes, the transformational innovations, over the next 15-20 years. The window of opportunity will close after that because of the dynamics of the climate system and of society.«

Fire Age
»As your notorious countryman, Bjørn Lomborg, is telling everybody, it’s much smarter not to mitigate, but just to adapt. Now, he doesn’t seem to know much about the potentially fatal climate impacts, but what he says is attractive to a lot of people, particularly in the field of economics. We will become smarter and wiser, the story runs, and in 20 or 30 years fixing the climate will be a piece of cake. Unfortunately, it’s also quite wrong. If we don’t mitigate, just choose to adapt, by the end of this century we’ll se temperature rise of four degrees or more, add to that the 0,8 degrees we’ve already experienced, and in all we’d have a change of about five degrees over two centuries. Five degrees is the difference between an ice age and a warm age, and you know what Northern Europe looked like during the last ice age. Not much to be seen. Furthermore, we are already in a warm age, so if we added the five degrees, we’d be headed for what you might call a fire age.«

»Five degrees is the average, because the continents heat up faster than the oceans. The continents would be warmer by eight or nine degrees, and high-lying regions like the Tibetan Plateau would warm by 12 degrees. All the glaciers would melt. But these glaciers feed rivers that sustain two billion people, and they would run dry in the

summer. This is not rocket science. This is probably the biggest impact of global warming if left unmitigated, and it would happen fast: by 2070-80 it would be a problem you couldn't solve anymore.«

»In the long run, there is the problem of sea level rise. One degree, in the long run, translates into 15-20 meters sea level rise in equilibrium. Two degrees, the target of the European Union, means sea level rise of 30-40 meters – over maybe a thousand years. Draw a line around your coast – probably not a lot would be left.
If Lomborg tells me to adapt to 40 meters sea level rise, the answer is, okay, that just means relocating the Danish population to Switzerland, Scotland, or …«

Greenland.

»Right! Because Greenland would be green again. It becomes almost hilarious in the end.«

»If you go beyond the critical threshold of a complex system, it collapses or completely changes its state of operation. That's something these people cannot grasp. If you do a sober calculation of what the world would look like with unmitigated climate change, you are simply terrified. It's so serious that it's foolish, even infantile, to suggest that we will just adapt, that we will outgrow global warming economically.«

What if you were to play a Lomborg and got, say, the 838 billion dollars that the US government just decided to spend on the economy. What would you do?

»I would indeed spend a good chunk of the money on the issues that are always on the list of Bjørn Lomborg and his Copenhagen Consensus people. But I would also ask: What sense does it make if I save these people from HIV if they then suffer and die from the impact of global warming? I would spend the majority of the money on the long term. That would be the balance in my own conscience. You have to weigh the needs of the present generation against the need for sustaining life for future generations. Every decent human being has to perform that trick.«

»I have a son who's ten months old, the sunshine of my life – and this is relevant for him. So that's the answer to Lomborg and his followers: it's simply wrong only to think in terms of economic value. My advice to politicians is not to do an economic cost-benefit analysis, because the scientific evidence is not able to deliver such a thing. But I would suggest using common sense, actually, and to provide a balanced approach, spending the money in a just way across the generations.«

The Pleasures of Ice
Walking down Telegrafenberg's narrow pathway your correspondent falls rather spectacularly on his arse. And lying there, neck slightly sprained, laptop possibly fractured, it seems right to take a minute to appreciate the nasty patches of ice still left to take a spill on, and to reflect on professor Schellnhuber's parting words.

»I'd love to be wrong,« he said. »If it turned out that all of us in this climate business had made a huge mistake and there was no global warming, I'd be very happy. I'd get fired, of course. But then I would go home and play with my son.«

Christoffer@zieler.dk