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Embracing the Complexity of Climate Change

In Conversation with Roland Kupers

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Interviewed by Martin Reeves

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<u>Roland Kupers</u> is an advisor on Complexity, Resilience and Energy Transition, as well as a fellow at the Institute for Advanced Study in Amsterdam and a Professor of Practice at the Thunderbird School of Global Management at ASU.

In this discussion with Martin Reeves, Chairman of the BCG Henderson Institute, he discusses his new book, <u>A Climate Policy Revolution: What the</u> Science of Complexity Reveals about Saving the Planet (Harvard University Press 2020).

Roland, thanks for joining me today to discuss your new book. What's the main thesis?

Well, the main thesis is that the longer we wait to deal with climate, the faster we need to act. The problem is that we have procrastinated for so long that we now require very rapid global change and not just incremental change. Fortunately, that may be possible. Specifically, our insight into complex systems will be helpful and certainly more helpful than economics, which has colored a lot of climate narrative to date. What we understand about complex systems, will help us drive change at the scale and speed that is required.

So let's dig into that a little bit. You contrast three approaches to climate policy. You talk about a control based policy lens, a market-based lens, and a complexity lens, which is the focus of the book. Could you illustrate how those three approaches differ?

Yes, absolutely. With the control policy, I mean top-down interventions where you act directly. So for example, you order coal plants to be closed, or you tell people to stop eating red meat. It's a direct action on the actors you want to change. A market approach is something like carbon pricing, where you use price signals to steer changes in the system. The complexity approach is a little less familiar to many people, but it would use measures like making solar panel adoption more contagious, like a "good pandemic". The core of it is that you shift the nature of the system so that new more desirable patterns emerge from it. So the key is to understand the relationship between the behavioral pattern of the system as a whole and the agents inside it. And that is where the science of complexity can help us quite a bit.

I agree that the third approach may be a little less familiar to people. So what are some of the main features of a complexity approach and the main concepts or tools?

It is less familiar, but it has been part of science for decades. Some of the important concepts are actually quite familiar, but complexity gives them more intellectual running room. The first thing is interconnectedness in systems. Plexus means interwoven in Latin, so complexity is the science of interconnected systems. There has been a realization that considering elements separately is often too coarse. For example, many discussions about climate change and climate policy are about changing the energy system. The problem is that the energy system sits at the heart of our economy and is deeply interconnected with many, many things. And so understanding how it's woven together and how an interwoven system changes, is essential.

Another feature is that the behavior of the whole cannot be easily understood from the parts: The cliché from complexity science is bird flocks. Birds can collectively do something amazing in their flocking behavior, even though there is no choreographer and the agents in the system are literally bird-brained. And yet, they can create this amazing collective pattern. If you apply that to climate policy, you want to change our collective patterns of our carbon emissions, so understanding the relationship between the parts and the whole is essential.

Another core idea is non-linearity, which means that sometimes small causes can have very large effects, and that is also the key to rapid change. It's something we experience with the pandemic today. Very small things can have massive negative effects in a pandemic. The trick is to have this kind of non-linearity in a desired direction, as opposed to in an undesired direction.

Why is complexity the right approach to climate change? You could argue that given that we're acting quite late in pursuit of a clear but challenging goal, direct control might be the only thing that can work. Why do you argue that complexity science is the revolution that we need in policy?

At the beginning of the book, I argue that it's necessary to add it on. I'm not opposed to control measures, and I think we should do them, if we can. The problem is that we have demonstrated for decades that we're just not capable of doing them. We might, but I'm not holding my breath. So, what I'm suggesting in this book, is that we should consider this other untried set of tools as well.

In a sense, liberal democracies are poor vehicles for driving systemic change because they have been designed not to do that for all sorts of good reasons. And more top down systems have not been so inclined, with the possible exception of China. So again, there's nothing wrong with top-down action for climate, but we have just not been doing it. And waiting for several more decades and not doing it doesn't seem like the right approach.

The challenge for climate policy is not so much what we need to do. There are about four or five things, but the harder question is, how do we get those things done? A lot of attention is given in books and newspapers about what we should do. But actually, that's the easier problem. The harder problem is how you find a path that can drive change. I list several examples in the book, but let me pick one of them as, which has some echoes from the current COVID crisis.

The adoption of solar panels on houses is contagious. So if your neighbors have solar panels, you are more likely to have them. And it's quite understandable because you chat over the fence and ask, why they got them. You can see from satellite pictures that the spread, just like an epidemic, varies by city, depending on the topology, the level of urban trust and the strength of the social fabric. So one of the interventions you could consider is to look for places that aren't "infected" yet. The question then becomes: who would be super-spreaders? In this case, you would identify super-spreaders for solar panel contagion, and perhaps give them free panels or stimulate them in some other way. You would choose a community leader who is well-trusted in an area. With a systems policy you would look for those sorts of mechanisms, rather than just at prices or incentives.

I know that your book is mainly about a way of thinking about policies for system change. But do you nevertheless have a thesis as to what the shortlisted and most powerful, underestimated systems measures might be?

That is not an easy question to answer because many interventions are contextual and local. In contrast, top-down interventions could be fairly uniform everywhere, like closing coal plants. This is harder. So, for example, I explain in the book how autonomous vehicles could be an effective climate policy. But that will only work in certain contexts because only some countries are likely to be amenable to deep penetration of autonomous vehicles in the short term.

In another example, I look at coal, which is at a tipping point. For a change catalyst we might be looking at the financing structure of the current coal expansion. There are roughly 12,000 coal plants in the world. We're planning on building another thousand. Yet they are financed by only a handful of financial institutions that are controlled by a handful of board members. So, you would look at the network structure of those people and search for ways of moving their social norms or the decision criteria of those institutions. But it is very much horses for courses and quite different from a top-down framework, which allows you to make lists and rank things easily. This is messier.

And could be the crux for persuading people of the benefit of a systems approach. We could argue that it is necessarily messy, there isn't an obviously better alternative and we need to get our minds around locally contextual measures and unpredictability. On the other hand, one could argue that this doesn't sound robust enough to be a solution to such an important problem. How would you persuade people that the messiness of the approach versus a more familiar top-down philosophy should not preclude considering it?

I find that when you engage with experienced policymakers, they are very familiar with this stuff and they understand the messiness of policy and the real world. It's when you look at the political narratives, the media, and some of the advisory reports that things get simplified because they are being framed in a traditional reductionist perspective. The policymakers themselves understand this approach quite well. But they find it hard to convince politicians and other stakeholders to tag along. But just because something is hard, is not a reason not to do it, especially if there's no better alternative. And it doesn't seem like there's much of a plausible alternative right now.

I've also been pursuing systems approaches in enterprises for some time now, and I would note the extraordinary persistence of a "mechanical" view of business, with unchanging goals and plans, created and implemented top down and with underlying assumptions of predictability and controllability. Do you find that the control or the market based approaches to climate policy encounter the same sort of mental resistance? And if so, how can we deal with that?

I'm less worried in the business context for the climate crisis because businesses, to a large extent, live in a reductionist world by design. The institution of the corporation, as you know, was invented here in Amsterdam in 1602, largely to solve a very specific problem of risk allocation in global trade. Companies are much more like the ants in the anthill. They're supremely useful and efficient, but not systemic agents. The language of control and reductionism is not always inappropriate in business situations. There are, of course, exceptions. The problem really occurs at the public policy level though. Public policy, in many ways, is a harder problem than business management. Ironically, civil servants are paid a lot less. So for climate I'm a little less worried about the lack of a systems perspective in the business community. But in public policy, it is a real issue.

Indeed your book powerfully advocates for this new sort of systems based thinking mainly in relation to climate policy. Let's assume that your book is very successful in making this case, and all of the G7 governments moved to adopt a systems based approach overnight. What would they do differently, if they were to look at the "before" and "after"?

I think they would look for solutions through a different lens. Let me give you three examples. The first thing is they would look specifically at the emergent patterns and not the individual agents. We need to focus on the collective pattern as opposed to try to just fix each individual agent.

Another thing is that they would figure out explicitly which path dependencies get in the way, and would develop policies to address these. Today, it's almost unheard of to have a policy that destroys or hinders something with the explicit explanation that its to escape a path dependency. Yet, we know that it is one of the major obstacles to changing systems.

A third bucket would be social norms policy. Eating much less red meat would be a big help for the climate. But it's equally clear that no government is going to force their people to eat less meat or to tax it. But on the other hand, you see vegetarianism increase at very different rates in different countries. Interestingly enough, we don't know why. We've not looked at whether you become vegetarian because your children or your friends encourage you or because you see something on television. If we understood that, we could accelerate it just like the solar panels example, through targeted measures. If you change your own social norms, then you're happy with them by definition.

We have the illusion that our own social norms are a free choice, but it's actually incredibly contextual. I just pick on the meat example because it's an easy illustration. A taboo in climate policy is that we are not going to get there with the same social norms as we have today. And you can't change social norms top down because that is unacceptable. But in a complex systems perspective, there is a path to evolving social norms in a way that can be acceptable in a democratic society.

Let me end with a more topical question, Roland. We're in the middle of the COVID crisis. Do you see that as a distraction and a setback, or as an essential accelerator of progress on climate change?

Like most things, it's hard to say. I think it's a mixed bag. Some elements are negative. It's quite depressing how many resources we can mobilize for a short-term challenge and how little for a long-term challenge. So that is a sobering realization. Also, our governance processes and social cohesion processes have been badly damaged. You look at the US, Brazil, and even Europe in many places. And those are necessary for climate policy, for which you need to have strong governance and social trust. But on the plus side, the pervasive grip of economics has been broken. What I mean is that the economy is important, but most would now accept that it's not the only thing that matters, and that's an important step forward.

And also we may have tweaked some social norms. We know from research that it takes something between three and six weeks to change your habits. And a lot of the constraints and changes have been imposed for long enough that they potentially might lead to some changed habits. You and I are talking remotely right now, and wouldn't dream of traveling somewhere to hold this interview, whereas in the past, we might have done so. Such habits are likely to stick. People may discover that they are not unhappy when not shopping twice a week. And thus some consumption habits may have changed permanently.

So in summary, it's a mixed bag. I think there are some negative aspects of the COVID crisis for the climate, but also some positive ones. And at the very least it has been a collective education in complexity concepts such as, social distancing, network effects, contagion, path-dependency; all terms from complexity science, which are rolling across our screens and our newspapers daily now.

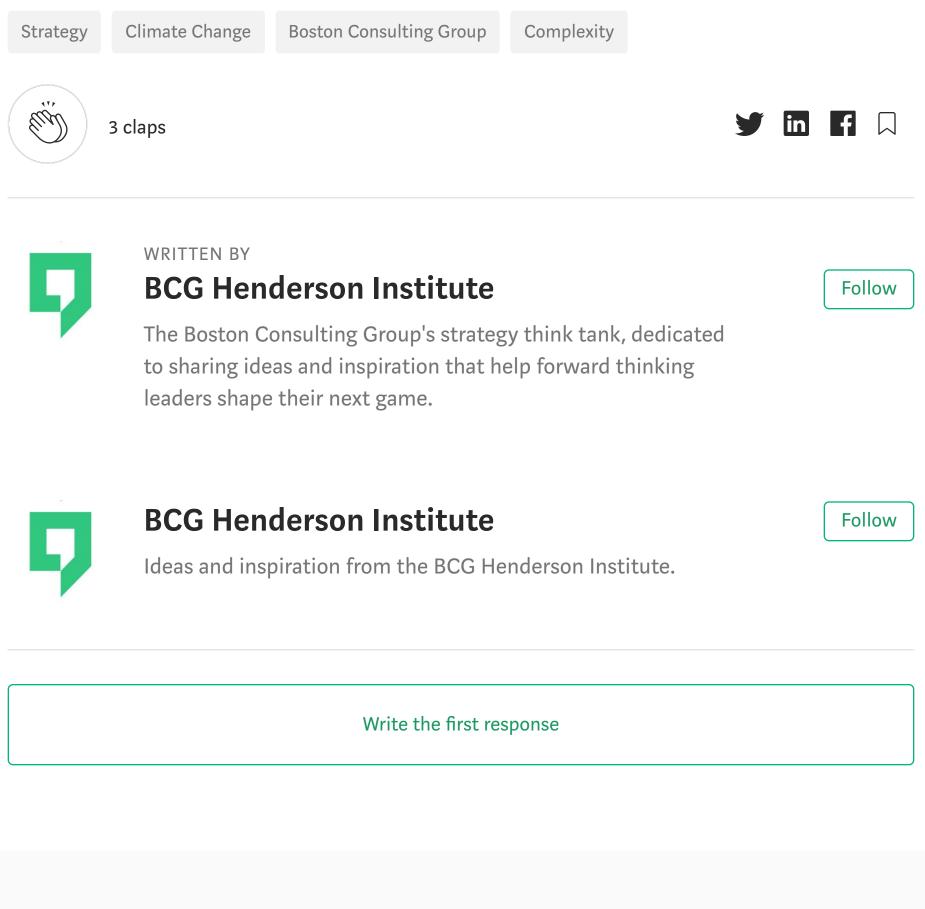
Roland, thank you so much for spending time with me today, to discuss your book on this vitally important topic.

Thank you so much, Martin.

<u>A Climate Policy Revolution: What the Science of Complexity Reveals about</u> Saving the Planet by Roland Kupers published by Harvard University Press can be found at <u>Amazon</u>.

About the BCG Henderson Institute

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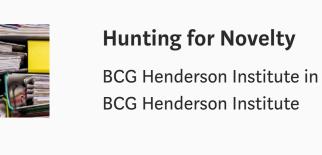
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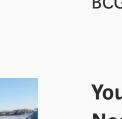
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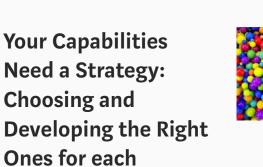


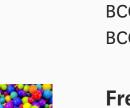


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