

12 QUESTIONS TO KARL W. STEININGER

1. From your point of view, what are the most pressing environmental problems today?

The climate crisis and biodiversity loss are the two most challenging environmental problems, emphasized by the fact that there are United Nations conventions in force for each. While these conventions were signed 30 years ago, pressure has nevertheless been increasing ever since. There's a wide range of environmental implications to these two crises, from water scarcity to natural disasters. There are further challenges, local in scope, such as air or soil pollution, which are increasingly pressing, particularly in the Global South.

2. When looking at potential improvements in our environment, what gives you hope?

Considering that the ozone hole is closing again – and is expected to have fully recovered by mid-century –, we should be reminded that the availability of low-cost substitutes for chlorofluorocarbons (CFCs) was a core ingredient in this success. Significant cost reductions in photovoltaic cells over the last couple of decades have helped in the gradual switch to renewables. But whether implementation and a corresponding change in our way of living will happen fast enough depends on societal awareness; movements like *Fridays for Future* are the ultimate source of hope.

3. Is there an environmental policy reform you particularly admire?

Not so much a particular instrument, but an approach to implementation: farsighted politicians have repeatedly succeeded in bringing about radical changes by creating space to gain experience with a changed environment. The Stockholm congestion charge, for example, was first implemented during a seven-month trial period. Only after that was a referendum held, resulting in majority approval, which would have been unthinkable before. Similarly, examples abound in which visionary individuals have changed the course of development by succeeding in experimental settings. With people attracted by their actual experience, these settings become long-term realities, such as pedestrian zones or the greening of streets, that are now commonplace and that we would miss if we were to lose them.

4. Which trend in environmental policy and politics do you consider to be an aberration?

The expectation that electric cars will solve our mobility challenges. We will not be able to solve the problem of mobility emissions if we continue to be blinkered regarding a comprehensive perspective. The focus needs to be on ensuring access, in a healthy manner and at the lowest overall resource demand – by clever spatial planning, active mobility and in many other ways, rather than

individual motorized mobility, given the energy, material and spatial demand of the latter.

5. Why do environmental research?

To identify how production and consumption patterns undermine a well-preserved environment – which is the very basis for mankind's survival – and to inform society about how to revise these patterns, such that they do not do harm, but are well embedded in nature's circularities.

6. What has your experience been with transferring scientific insights into practice?

The transfer works most effectively when both awareness and understanding are enhanced by translation to simple, everyday-experience “pictures.” It succeeds when the actual problem setting has been identified in dialog between science and practice, when practitioners can build upon a trustful relationship with scientists.

7. What field of research in the environmental sciences do you find most exciting, apart from the one you're working in?

I'm interested in the natural sciences that are studying the elements and their interactive behavior, from resource-minimizing flow chemistry that is redesigning chemical reactions up to microbiology that is studying microorganisms. Unlike the social sciences, the objects of analysis in the natural sciences do not change their behavior in response to research results, but rather disclose nature's fundamentals.

8. What person or event has had a particular influence on your commitment to environmental issues?

My younger brother's environmental activism triggered my earliest interest. Later, engaged faculty – both in Vienna and at UC Berkeley's Energy and Resources Group – as well as Herman Daly, then at the World Bank, were instrumental in connecting me to environmental and ecological economics. On climate issues it is my current geophysicist colleague – particularly when sharing his shocked feelings during geophysical data observation – who moves me deeply with his authenticity.

9. What knowledge about the environment would you like to pass on to young people?

That natural systems are endowed with high resilience and fully circular flows, two aspects that our socioeconomic systems need to refocus on. We'd feel so much better in all our daily practices in such a restructured world. Beyond that, I'd like to pass on the desire to experience nature “out there,” to get in direct contact with it, as human beings, in both a physical and an emotive sense.

10. As a scientist concerned with sustainability, what contradictions do you face in everyday life?

With access to sustainable products now broadly available, it is sheer laziness that sometimes leads to products with unnecessary packaging – not to mention fair trade concerns – ending up in my shopping bag. In my professional world, air travel – although it has been reduced – seems to be unavoidable.

11. What are you currently reading?

The Ministry of the Future by Kim Stanley Robinson. It brings scientific climate facts down to the level of humans being affected and therefore changing course in their lives, all this while being perfectly aligned with facts. Not to mention books that have been in my backpack for a long time, by Thomas à Kempis and by those who relied on him, such as the diary of Dag Hammarskjöld, the second Secretary-General of the United Nations.

12. What is the most important question of our day, apart from the ones we've raised here?

How can we create forums for dialog that will develop common visions, such that we identify with them and turn out so strongly in support of them that implementation follows suit? A quote by Hegel emphasizes this imaginary power, as he wrote in a letter to Niethammer (1807): “Theoretical work, I convince myself more and more every day, achieves more in the world than practical work; once the realm of the imagination is revolutionized, reality does not stand”.



Karl W. Steininger,

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Born 1965. Studies in economics and computer science, PhD in economics. 1989 to 1990 graduate studies, University of California, Berkeley. Since 1999 associate professor in economics, University of Graz. Since 2004 head of research group (*Economics of Climate and Environmental Change*), 2019 professor, Wegener Center for Climate and Global Change, and head of the doctoral school, department of economics, both University of Graz.

Research focus: environmental and resource economics, transport economics, spatial economics, international economics and public finance.

Selected memberships: *Austrian Economic Association* (past president) | *Monitoring Group of the Paris Agreement and Transport* at the national transport norming body FSV (chair) | *Climate Change Centre Austria* | *Chapter of Environmental and Resource Economics* of the *German Economic Association* (Verein für Socialpolitik).

Selected publications: Sectoral carbon budgets as an evaluation framework for the built environment (*Buildings and Cities*, 2020; with others) | Austria's consumption based greenhouse gas emissions: Identifying sectoral sources and destinations (*Global Environmental Change* 2018; with others) | Multiple carbon accounting to support just and effective climate policies (*Nature Climate Change*, 2016; with others) | Consistent economic cross-sectoral climate change impact scenario analysis: method and application to Austria (*Climate Services*, 2016; with others) | Justice and cost effectiveness of consumption-based versus production-based approaches in the case of unilateral climate policies (*Global Environmental Change*, 2014; with others).

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KARL W. STEININGER ...

... and I first met in the mid-1990s after we both joined the scientific alliance *SUSTAIN*. At the time, Graz was where the academic avant-garde of Austria came together to exchange ideas on sustainable development in a multi- and cross-disciplinary manner. Working at the interface of international trade and environmental/ecological economics, Karl pioneered greenhouse gas accounting of international value chains, establishing a quantitative analysis of policy instruments to address greenhouse gas mitigation by means of multiregional macro-economic modeling.

After gaining experience in the field of interdisciplinary environmental science at the University of California, Berkeley, he acted as founding chair of the first Austrian environmental systems science program at the University of Graz. This program became one of the most popular and successful programs of its kind in Europe with some 2,000 students and graduates in leading positions around the globe.

On the first strike day of FFF, he was teaching pupils in front of the school.

Karl's interdisciplinary work with both faculty and students, along with his efforts to establish a worldwide collaborative network, has led to many further achievements. Particularly important is the establishment of Austria's largest interdisciplinary climate change research institute, the *Wegener Center for Climate and Global Change*, which he and Gottfried Kirchengast have built up since the early 2000s. Both are still members of the Board of Directors, leading research groups.

On a national policy level, Karl has been engaged in the *Austrian Panel of Climate Change* from the beginning. Following the assessment concept of the Intergovernmental Panel on Climate Change (IPCC), with Karl acting as co-editor of a three-volume report involving some 270 contributing authors, Austria was among the first countries to have a fully-fledged national climate change *Assessment Report* published in 2014. This greatly affected scientific, political and public awareness in the country and helped to channel societal discussions. Karl has also guided the national climate impact analysis *COIN (Cost of Inaction)*, covering a range of impact fields and their interaction.

Also Karl was on the founding Board of Directors of the *Climate Change Centre Austria* and has acted as an independent scientific advisor to the current Austrian government regarding negotiations on climate policy. Over the past 15 years, he has also been invited to give expert testimony to all four enquiries on climate change in the Austrian parliament, each time being nominated by a different political party.

Given that the task of changing course towards a more sustainable and thus a more equitable world will be borne by today's youth, it was not surprising that, on the first strike day of the *Fridays for Future* movement in early 2019, Karl was teaching pupils of an entire school on climate change in the square in front of the school building. Educating school pupils has meanwhile become its own project, carried out by environmental systems science students under his direction. In this way, Karl lives up to the saying attributed to Nelson Mandela: “Education is the most powerful tool to change the world.”

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