

---

## Preface

To my surprise, my book *Das grüne Paradoxon*<sup>1</sup> triggered an international scientific debate and a swelling flow of scholarly papers. I am glad that this updated English edition has become available. I hope that a wider international audience will now have a chance to consider the issues the book raises. The English version has been condensed and focused on topics more likely to interest an international readership.

Non-European readers may forgive me for the fact that my European background shows through here and there. Europe is the center of a “green” policy thrust. My home country, Germany, is the world champion in solar power and biodiesel, number two in wind power, and one of the few countries adamantly determined to turn their backs on nuclear power. In Germany, the “green” idea has developed a momentum that reminds me of the rigor and zeal of the time, about 500 years ago, when Protestantism was born in the same country. Because I am a sober economist by training, the quasi-religious aspects that I occasionally detect here have made me a bit wary. But I can reassure the reader that in this book I have tried to be as general, unbiased, and international as I can. The international bent also explains why all numerical data are given in metric units, and why all tons are metric tons. (In many places, to make it easier for American readers, I have given the equivalent non-metric measures in brackets.)

My motivation for writing this book was a certain degree of frustration with the prevailing governmental policies for fighting global warming. Throughout Europe and elsewhere, particularly in California, politicians are keen to curb consumption of fossil fuels. They are busily promoting alternative energy, improved building insulation, and more efficient cars. They forbid citizens to use traditional light bulbs, force them to buy expensive “green” electricity and biofuels, impose emission

constraints on car engines, subsidize electric cars, impose tough norms on the insulation of buildings (forcing homeowners to wrap their buildings in wadding), and frighten their citizens by announcing that they will come up with even tighter measures in the future. These programs cost hundreds of billions, yet in many cases they achieve little or nothing. The relentlessly rising curve of worldwide CO<sub>2</sub> output does not deign to honor these efforts with even the merest downturn.

This does not mean that mankind should give up the fight. In the first two chapters I show that we do indeed have a problem, and I discuss which energy options we may apply to solve it. However, the discussion, unavoidably and disappointingly, ends on a note of skepticism toward some of the technical fixes touted in the special reports that fill pages in our newspapers every other week.

In quantitative terms, the most important “green” energy source currently being developed is biofuels. I find biofuels problematic, if not downright dangerous, for the climate and for world peace. For reasons I spell out in chapter 3, replacing fossil carbon with biocarbon not only accelerates global warming but also deprives the world’s poor of their food. It puts in our tanks what they would like to see on their tables. The link that has been re-established between the market for fossil fuels and the market for biocarbon is an unfortunate development of historical dimensions, one that risks pushing mankind back into the Malthusian trap.

But my concerns go further. I find the policies against global warming often naive and counterproductive, since they focus purely on demand, neglecting the supply side of the carbon markets. President Mahmoud Ahmadinejad of Iran, President Hugo Chávez of Venezuela, the Arabian oil sheikhs, Vladimir Putin’s oligarchs, and all the coal barons of this world simply do not figure in the policy programs. However, these resource owners are the real climate makers. By bringing fossil carbon back into the carbon cycle by supplying it to the markets, thereby enlarging the stock of carbon dioxide in the atmosphere, they determine the speed of global warming; consequently, they hold the fate of humanity in their hands.

The resource owners regard the tightening of “green” policy measures with increasing concern, because they perceive them as what they are: a way of destroying their future markets. Quite understandably, they try to pre-empt the corresponding wealth losses by extracting and selling their fossil fuels before their markets disappear. That is the Green

Paradox: announced future reductions in carbon consumption may have the effect of accelerating climate change now. I suspect that one of the reasons why the prices of fossil fuels fell in real terms from 1980 to about 2000, even though China and India emerged as new consumers in the market, can be attributed to the “green” saber-rattling that occurred during that period. Resource owners simply hurried to secure their wealth by extracting their resources before the environmentalists could seize them.

Whether I am too pessimistic remains to be seen. The scientific debate will have to clarify that. But it seems to be clear that it is high time for environmental policy to shift its focus from the demand for fossil fuels to the supply of such fuels. Instead of mulling over for the thousandth time which technical fixes could be applied to reduce CO<sub>2</sub> emissions, we should turn to the question of how to induce resource owners to leave more carbon underground. Unfortunately, that goal will not be easy to achieve with the policy tools that the industrialized countries have at their disposal. Uncoordinated idiosyncratic measures by single countries or by groups of countries (such as the European Union) will achieve nothing, other than frightening the resource owners even more and inducing them to overextract.

However, the toolbox available to policy makers is not entirely empty. I argue in this book that only a swiftly introduced “Super-Kyoto” system, combining all consuming countries into a seamless demand cartel using a worldwide cap-and-trade system, will help. This system should be supported by the levying of source taxes on capital income to spoil the resource owners’ appetite for financial assets.

So far, policy makers exhibit not the slightest glimmer of thinking about how they could influence the supply side of the carbon market. Hundreds of resolutions, laws, and promotion programs have been promulgated, all aimed at curbing the demand for fossil fuels, without one mention of the supply side. Half of the market for fossil fuels has simply been disregarded.

Until recently, even science hadn’t really paid attention to the supply side. Models of long-term fossil-fuel extraction didn’t concern themselves with the climate. Climate models, in turn, typically didn’t concern themselves with the extraction of such resources. The few exceptions had to be searched for with a magnifying glass. These were theoretical models that never made it into numerical climate-simulation models, let alone to the public policy debate. Only recently have more scientists, including

one from the Intergovernmental Panel on Climate Change,<sup>2</sup> begun to explicitly model the supply side numerically, joining in the Green Paradox debate.

Precisely because I consider climate change one of the greatest problems humanity faces, I find this neglect profoundly disquieting. Thus, I hope that policy makers will read this book. Those who have learned to focus on the supply-side effects of their policies will shed their illusions and will support a climate policy that offers better chances of staving off disaster.

In writing this book I enjoyed help from a number of members of the Ifo Institute and the Center for Economic Studies at the University of Munich. A first translation of the second German edition was prepared by Julio Saavedra, who also helped me polish my style when I made a condensed and updated English version out of it. Occasional help with the English also came from Paul Kremmel. Christian Beermann, Petra Braitacher, Max von Ehrlich, Mark Gronwald, Darko Jus, Wolfgang Meister, Johannes Pfeiffer, Tilman Rave, Luise Röpke, Johann Wackerbauer, and, above all, Hans-Dieter Karl supported me in data mining, in searches of the literature, and in various calculations. The graphs were prepared by Christoph Zeiner with the help of Jana Lippelt. Martin Faulstich, head of the Wissenschaftszentrum Straubing and chairman of Germany's Sachverständigenrat für Umweltfragen (Advisory Council on the Environment), read the entire German manuscript and gave me very useful advice. Maximilian Auffhammer of the University of California at Berkeley also made useful comments. Knut Borchardt, my admired senior colleague on the faculty of economics at the University of Munich, provided me with insightful comments on the history of industrialization. Finally, three anonymous referees consulted by the MIT Press made very valuable suggestions for further improvement of the manuscript. I thank all of them for their generous support.

The German predecessor of this book was dedicated to Sascha Becker, Helge Berger, Marko Köthenbürger, Kai Konrad, Ronnie Schöb, Marcel Thum, Alfons Weichenrieder, and Frank Westermann, former students with whom I had been able, over the previous decades, to gain some of the knowledge that has gone into this book. I dedicate this version to my former professor and thesis supervisor Hans Heinrich Nachtkamp on the occasion of his eightieth birthday. He taught me intertemporal economics and dynamic optimization about 35 years ago. After so many years and quite a number of complicated mathematical papers on intertemporal

topics, I finally dared to talk about intertemporal economics in ordinary language that every educated person should be able to understand, regardless of his or her field of specialization, hoping that my fellow colleagues will not think this is non-science simply because the equations have been turned into words. I can assure them that this was more difficult than doing it the other way round.

Munich, January 2011