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**Article**

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## HANS-WERNER SINN, CLIMATE CHANGE AND THE GREEN PARADOX

NICHOLAS STERN\*

Hans-Werner Sinn has been a leader in the analysis of the principles of public economics and public policy for around four decades. And he has led public discussion. He is truly a public intellectual, in the best sense of the term: greatly admired by his fellow academics and a powerful and constructive influence on the public stage. I have had the privilege of interacting and collaborating with him on many occasions and issues, including *via* the editing of the *Journal of Public Economics*, the Munich Lectures which I gave in 2002 and, in recent years, around the economics of climate change.

His work on the economics of climate change, in particular ‘The Green Paradox’, my subject here, reflects his great skills in theory and his wisdom and judgement about how the world works, or could work. As always he gave a refreshingly different focus from the rest of the literature, in this case by concentrating on the supply-side. In so doing he showed and stressed how apparently well-intentioned policies could go wrong. One example he stressed was the misguided use of some (not all) biofuels, such as those based on corn, which can be very inefficient and divert resources from food.

He argued, very sensibly, that there are two mechanisms to reduce (or ‘mitigate’) the build-up of carbon in the atmosphere. First we can extract and use less fossil fuels and second we can capture and store the carbon. His focus was on the former. He asked will our price and policy incentives lead to suppliers extracting less, i.e. he asked directly about the supply side, which all too few had been doing.

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His green paradox was the potential problem of hydrocarbon processes being incentivised to extract their resources more quickly in the near future, in the anticipation that policies on carbon would tighten in the future. Essentially a price on tax-based carbon policy involves creating a wedge between prices received by producers of hydrocarbons and those faced by users. The former must fall and the latter must rise if there are to be incentives to extract less and use more. Hence the problem arises of extractor-producers anticipating a future fall in the prices they receive for their products and trying to extract more now.

In these circumstances quantity-based policies should have a strong role. Thus cap-and-trade schemes would be a priority, where policy begins with a quantity target and prices for carbon are determined endogenously. He argued that effectiveness required that demanders come together to enforce the policies as a group. In so doing they could also influence resource-rents and the price that they pay; cutting the costs of the policies. One would, of course, expect resistance from those who would thereby have their rents reduced.

In many ways Hans-Werner anticipated the divestment discussions around the so-called ‘keep it in the ground’ campaign. Recent work by the Carbon Tracker Initiative with the Grantham Institute at the LSE and others (such as international bank HSBC), has shown that known hydrocarbon resources, if buried without carbon-capture and storage, would emit around three times as much carbon dioxide as is consistent with the international 2 degree Centigrade target (increase in average global surface temperature since the 19th century), beyond which the science tells us, sensibly, we have dangerous climate change as expressed in the assessment reports by the Intergovernmental Panel on Climate Change. The world is already on the edge of its temperature in the Holocene, the period since the last ice age, of our civilisations. We are headed way above 3 degrees, temperature not seen on the planet for 3 million years – *homo sapiens* has been here for only a quarter of a million.

Hans-Werner recognised the severe dangers. He showed us, very importantly, that we must focus on

the supply side as well as the demand side, and brought out the policy dangers from focussing only on the latter. He pointed, too, to the importance of a focus on resource taxes, resource rents, this including the assets, portfolio and investment side. We now see many discussions of decarbonising the portfolio, or disinvestment. Over time the world, as on so many other issues, has followed the directions marked by Hans-Werner Sinn.