



## Harvard Kennedy School Energy Policy Seminar Series, Fall 2015

### Where are We Heading? Pondering the Likelihood of Alternative Carbon Emissions Pathways

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Whaling was ended by the discovery of oil, not by public policy, Professor Dan Schrag, Director of the Harvard University Center for the Environment and of the Harvard Kennedy School's Science, Technology, and Public Policy Program, observed in his talk in Monday's Energy Policy Seminar, which reviewed the prospects for an energy transition over the next century, asking what role policy might play in "steering the ship towards an outcome we want."

Schrag used the IPCC "carbon path" scenarios developed in the 1990s as a point of reference, asking where the world is likely to end up within the range of scenarios—from quickly flattening carbon emissions, to steep growth.

Schrag began by highlighting the key importance of predictions about GDP growth in upward carbon emissions trajectories—the more growth is anticipated, the more likely it is that carbon emissions will grow significantly. Reviewing progress to date and the targets currently being proposed by key nations, Schrag saw the lowest emissions scenarios as "virtually impossible." However, he noted that some of the IPCC's most pessimistic scenarios for ballooning carbon emissions growth now look unlikely. This is not due to the success of world carbon policy, Schrag noted, but due to the fact that our ideas about likelihood of robust, steady worldwide GDP growth have changed a lot since 1992.



Schrag highlighted a number of ways in which the world economy would need to change to significantly lower carbon emissions (with an eventual goal of reaching zero emissions). The classic policy solution of a price on carbon, he noted, may not be enough—especially given the likely difficulties of increasing the price, if the science calls for it in the future. Technology is likely to be crucial (just as it was in ending the world trade in whale oil) along a number of dimensions—managing renewables, finding ways to make nuclear power affordable, eliminating petroleum from the transportation sector, electrifying heating, developing carbon storage ("absolutely critical" for a low-carbon economy, Schrag observed), and leveraging energy efficiency, among other challenges.

Will there be a role for policy in determining how successfully the world makes needed changes? A challenge is that current policies focus almost exclusively on near-term carbon emissions, which Schrag argued is a very imperfect metric for progress. Focusing on near-term emissions reductions may not send the right market signals to invest in the sorts of technologies that will allow deep decarbonization in the future. One example, Schrag noted, is China's commitment to building a large number of new nuclear power plants. Nuclear power will make only a tiny contribution to China's emissions in 2030, but could be absolutely critical to shutting down existing coal plants and reducing emissions in the middle of this century. The challenge is to develop parallel metrics that measure these kinds of investments in technologies that may be relatively small in scale today, but will be absolutely critical to achieving deep carbon reductions in the future.

Schrag spoke as part of the Kennedy School's Energy Policy Seminar Series, which is jointly sponsored by the Energy Technology Innovation Policy research group of the Belfer Center and by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.