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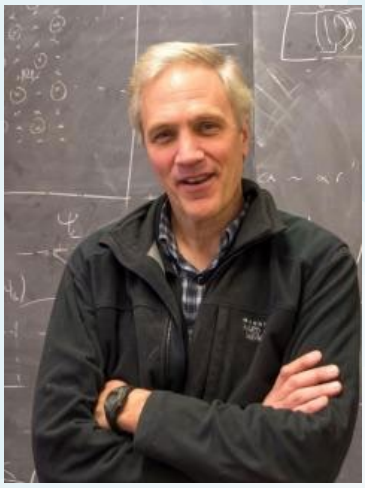
8 a.m. CDT; 9 a.m. EDT; 1 p.m. GMT; 9 p.m. Beijing

Wednesday, March 31, 2021



Steve Pacala

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Steve Pacala is the Frederick D. Petrie Professor in Ecology and Evolutionary Biology at Princeton University. He is interested in the processes that govern ecological communities, the interplay between community and ecosystem-level processes, and the interactions between the global biosphere and climate. He develops, calibrates and tests mathematical models to explain ecological structure and function. His research focuses on all aspects of the global carbon cycle. Over the past several years, his lab has developed methods to scale-up individual-based models of communities and ecosystems without the need to run the individual-based model. Their global model makes predictions about the large-scale distribution of biomes and associated biogeochemical fluxes, as well as specific local predictions, including hourly physiological carbon gain and water loss, community composition and dynamics throughout succession, the outcome of spatial competition among plant species, and the fluxes of nitrogen, water and carbon. He is chair of the NAS Committee Accelerating Decarbonization in the United States: Technology, Policy, and Societal Dimensions. Pacala is a member of the National Academy of Science and the American Academy of Arts and Sciences and is a Fellow of the Ecological Society of America Fellow and the American Association for the Advancement of Science.

How to Achieve Net-Zero Greenhouse Gas Emissions in the United States by Midcentury

Scientific evidence has been clear for some time that global net emissions of all anthropogenic greenhouse gases must fall to zero by 2050 if humanity is to have a reasonable chance of limiting global warming to substantially less than 2 degrees Celsius. However, it is only in the past couple of years that the net-zero goal has been widely adopted by countries, states, cities, and companies. I first argue that this shift was caused primarily by an unheralded revolution in energy technology, which was itself the result of decades of public policy. I then turn to two recent studies that together, provide an engineering and policy manual for the transition to net-zero in the United States by 2050. The first is the Princeton Net Zero America Project, which was released in December 2020. NZAP provides a geographically and sectorally granular blueprint for a 30-year transition to each of several feasible net-zero energy systems. The study was designed to answer the question posed by a lawmaker: "What's in it for my constituents?" Primary conclusions of NZAP are: 1. The transition is affordable. The United States would spend a smaller fraction of its GDP on energy during the 30-year transition, than is has over the last 30 years. 2. The transition would achieve health benefits during the first 10 years that dwarf its cost. 3. The transition would cause an increase in energy jobs, but some locations with a high concentration of fossil jobs would see declines in energy employment. However, public policy could address this problem because many net-zero industrial jobs are not tethered to a specific location. I will specifically discuss NZAP's projections for Oklahoma. The second study is a National Academies of Sciences, Engineering, and Medicine report, released on Feb. 2, 2021, which I chaired. Unlike NZAP, which is a policy-neutral engineering analysis, the NASEM study proposes a specific portfolio of policies for the first ten years of a fair and equitable 30-year transition to net-zero emissions. Many post-release conversations with federal officials and lawmakers confirm that the primary concern in Washington is no longer cost, but rather employment, fairness, equity and environmental justice. The NASEM report is the only analysis focusing equally on the technical aspects of the transition, and on fairness, equity and justice.

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Organizing Committee Chair: Jizhong Zhou (University of Oklahoma, USA; https://www.ou.edu/ieg)
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