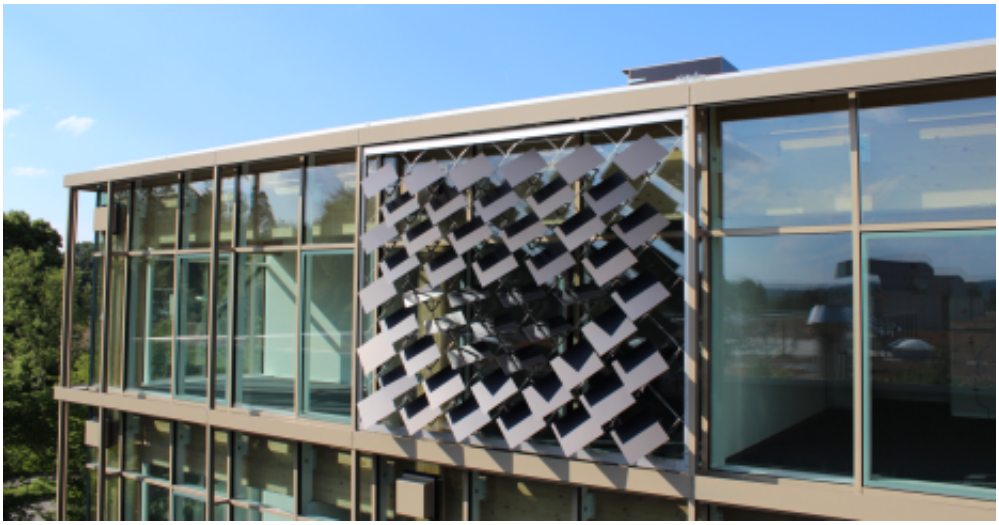
Accelerating low-carbon innovation through policy

February 13 2017



Adaptive Solar Facade. Credit: Chair for Architecture and Building Systems, Institute of Technology in Architecture, ETH Zurich

Global climate change is affecting our planet and mankind; climate science is thus instrumental in informing policy makers about its dangers, and in suggesting emission limits. Science also shows that staying within limits, while meeting the aspirations of a growing global population requires fundamental changes in energy conversion and storage. The majority of low-carbon technology innovation observed in the last decades, such as the 85% cost reduction in photovoltaic cell production since 2000, was driven by largely uncoordinated national policies. These included research incentives in Japan and the U.S., feed-

in tariffs in Germany, and tax breaks in the U.S.

During the AAAS 2017 Annual Meeting in Boston, Tobias Schmidt, ETH Zurich - The Swiss Federal Institute of Technology in Zurich, Switzerland, Jessika Trancik, Massachusetts Institute of Technology, Cambridge, U.S.A., and Masaru Yarime, City University of Hong Kong, will review the successes and failures of policies for low-carbon technology innovation and show how characteristics of both the technologies and the policy instruments themselves helped and, in some ways, hindered technological progress. In addition, they will demonstrate how research by the innovative science community can inform policy decisions in the future to accelerate low-carbon innovation and affect the livelihood of our planet in the long-term, despite limited resources.

Modelling Technology Innovation to Accelerate Clean Energy Development

Wind and solar energy installations have grown rapidly in recent decades as their costs have fallen. It remains unclear; however, whether these trends will continue, allowing the technologies to measurably contribute to climate change mitigation. Jessika Trancik, Associate Professor of Energy Studies at the Massachusetts Institute of Technology (MIT) in Cambridge, USA, uses the case example of photovoltaic technology to uncover the key determinants of innovation from the formulation of policy to the design of technologies. She explains the feedback of emission reduction and the practical lessons that emerge for engineers and policy makers alike.

Considering Different Types of Learning in Low-Carbon Innovation Policy

Recent empirical studies demonstrate that innovation patterns and

technological learning can differ strongly between energy technologies. Fostering low-carbon innovation may thus require technology-specific policy interventions. Tobias Schmidt, Assistant Professor of Energy Politics at ETH Zurich, Switzerland compares photovoltaics (PV), wind and lithium-ion battery storage technologies in relation to the locus of innovation in the industry value chain, learning feedback, and type of innovation. He relates his observations to technology architecture and production processes deriving implications for other energy technologies. Based on these analyses, Schmidt makes recommendations for the design of policy portfolios to accelerate innovation in clean energy.

Encouraging Stakeholder Collaboration for Smart City Innovation

Masaru Yarime, Associate Professor at the School of Energy and Environment, City University in Hong Kong presents case studies from Japan and the U.S. on how low-carbon energy technologies can be implemented within the larger systems of smart cities. Their implementation calls for the promotion and integration of a variety of innovations in the electronic, housing, automotive, and infrastructure sectors. This requires collaboration and coordination with relevant stakeholders in academia, industry, government, and civil society. Yarime examines smart city projects with policy implications for platform creation, technological development, and end-user engagement.

Provided by ETH Zurich