Systems Approaches to a Clean Environment

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Environmental deterioration is a deeply complex topic, both in terms of understanding its effects as well as its root causes. The complete range of feedbacks and interactions underpinning environmental issues intrinsically span many different scientific fields. The multifaceted nature of engineering approaches to addressing such problems thus frequently benefits from a systems approach to solutions for a clean environment.
This session will therefore seek to shed light on the topic from several perspectives:

- **Symptoms** -- a current diagnosis: What is happening to the environment? What are the key sources of pollution in the form of GHGs, particles, non-degradable compounds, etc.? What is the status of these pollutants and the present outlook in terms of recent knowledge gained in the field, new measurement methods, etc.?
- **Social** -- a personal view of the impact: How do humans react to damaged and degraded environments? As individuals (cognitive)? As groups or societies? What are the frontiers of current research on behavior, psychologically as well as how society is organized (governance, impact on democracy, role of social media…)?
- **Systems** – a view of the relationships across boundaries: What is our understanding of the underlying mechanisms causing the symptoms? How are these governed by a more physical perspective (reservoirs and flows of matter and energy)? How are different aspects of the system connected?
- **Solutions** – an example of a path towards a cleaner world: What are the details of one specific solution, or what is an overview of some of the most interesting ongoing initiatives around the world to tackle environmental problems? What are the roles of technology but also business, models, logic and policy?

Speakers:

The Economic Case for Combating Climate Change
Stefan Schönberger, Boston Consulting Group, Hamburg Office

Net-zero Emissions Energy Systems
Steven Davis, University of California, Irvine

Swedish Roadmaps for Fossil-Free Competitiveness
Malin Strand, Fossil Free Sweden

Toxic Air Pollution as a Sustainability Challenge
Noelle Eckley Selin, Massachusetts Institute of Technology