

Designing a Friendly Space for Technological Change to Slow Global Warming

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Snowmass Workshop

on Technologies to Combat Global Warming

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The Agenda for the Next Two Days

- A central problem in combating global warming will be the need to make a *smooth transition* from existing technologies to new low-carbon technologies in the coming decades.
- Historical changes of this kind, such as the transition from traditional energy forms to fossil energy, have been *very disruptive*. But they have also resulted in unprecedented economic development and *improvements in human well being*.
- Understanding of the dynamics of technological change is the *least understood part of the global warming nexus*. Scientists have focused on the geophysical aspects, but we have largely neglected the technological environment.
- Our focus will be on how to *foster an economic environment* that will help smooth the transition to the new low-carbon world. In doing this, it is critical to understand the *policy instruments* that will induce firms, entrepreneurs, governments, and not-for-profit participants to undertake the necessary research, development, and commercialization.

The Agenda for the Next Two Days

- Is decarbonization an incremental change or are radically different systems called for? Gradual or punctuated evolution?
- Can “Inputs” to the innovation process be measured by outlays for energy R&D? Complexity of the innovation “chain” is a challenge making “linear” approaches futile.
- How can we measure the “outputs”? Technological learning and performance improvements are a function of cumulative effort (not of timing), but the process is poorly understood (the “black-box” model)!
- Is there a way to identify the transition to emerging systems (in models & strategy)? Technology portfolios vs. winner dominance?
- How to model different roles of R&D and markets? R&D generates variety, market the selection; R&D diversity for various niches.

Ground rules:

speakers have 20 minutes

discussants have 10 minutes

let's have plenty of time for discussion!

Snowmass rules for attribution:

Any written material (papers or preliminary work on the workshop web page, handouts, or presentations) may be cited and used subject to the proviso that they should be described as "preliminary and unpublished." Furthermore, we would encourage reports on the discussions in the individual sessions. However, when there is a direct quotation of the discussions with attribution to a specific person, the quotation should be checked for accuracy with the person quoted.

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