INNOVATION POLICY FOR CLIMATE CHANGE

Consortium for Science, Policy and Outcomes

Clean Air Task Force

In cooperation with

The Bipartisan Policy Center/National Commission on Energy Policy

July 2009

CLEAN AIR TASK FORCE

CSPO Consortium for Science, Policy and Outcomes

The Project

- Six month study undertaken by CSPO and CATF:
  - Examined past US lessons from IT, defense, energy innovation.
  - Brought together two dozen innovation experts from technology, finance, government, academia at workshops on PV, post-combustion capture of CO_2, and air capture of CO_2.
- Project Goal: develop ***general principles and recommendations*** that can guide government innovation policy, with particular focus on accelerating progress in next two decades.

Rationale

- The world is not on a path to reduced greenhouse gas emissions.
- The suite of commercially viable climate-friendly energy technology needs to be expanded rapidly.
- A great deal is known about technological innovation, but little of that has yet been captured in discussions of energy-climate policy.
- Government policy has been crucial catalyst for innovation for past 60 years and more.

The Challenge: A Systems Problem

- The energy system is a complex socio-technical system that is not subject to direct management or control.
- Customers are undemanding. Energy is a largely invisible and undifferentiated commodity; cleaner energy does not offer new, commercially attractive functions.
- Carbon prices in next 10-15 years will not be sufficient to drive system transformation.
- US energy innovation policy has lacked a clear mission or strategy. DOE has focused on curiosity- and politically-driven R&D, neglecting commercialization and large scale demonstration relevant to private sector. Other agencies have not been much involved.

Learning from:

- Nukes
  - sole major post-war energy innovation
  - government drove rapid (premature) scale-up in face of unfavorable economics
  - policy drove significant early private sector commitments
  - too few innovation paths explored (more demos needed)
  - poor performance in early years
- Info Tech
  - Moore's Law
  - innumerable novel applications
  - crucial government role in R&D and purchasing
  - demanding customers, especially DoD
  - rapid diversification, growth of firms

Learning from:

- High Temp Superconductors
  - 1986 “breakthrough”
  - 2009 still no significant commercial applications

- PV, PCC, AC
  - it’s not about basic research
  - government role crucial, but distinct for each

Principles

- 1. The energy system is highly complex, as are energy-climate innovation processes. Multiple paths must be pursued with multiple approaches.
- 2. Energy innovation over at least the next 10-20 years will be dominated not by “breakthroughs,” but by incremental advances in technologies that are now in view.
- 3. A decarbonized energy system is a public good akin to national defense, individual and community health and safety, and protection from natural disasters.
- 4. Energy-climate innovation policies must be tailored to particular technologies and suites of technologies.

Recommendation 1

To stimulate diverse innovation pathways within the complex U.S. energy and innovation systems, **competition within government must be enhanced** to ensure accountability, effectiveness, and learning. Policymakers should diversify government participation in energy-climate innovation.

Recommendation 2

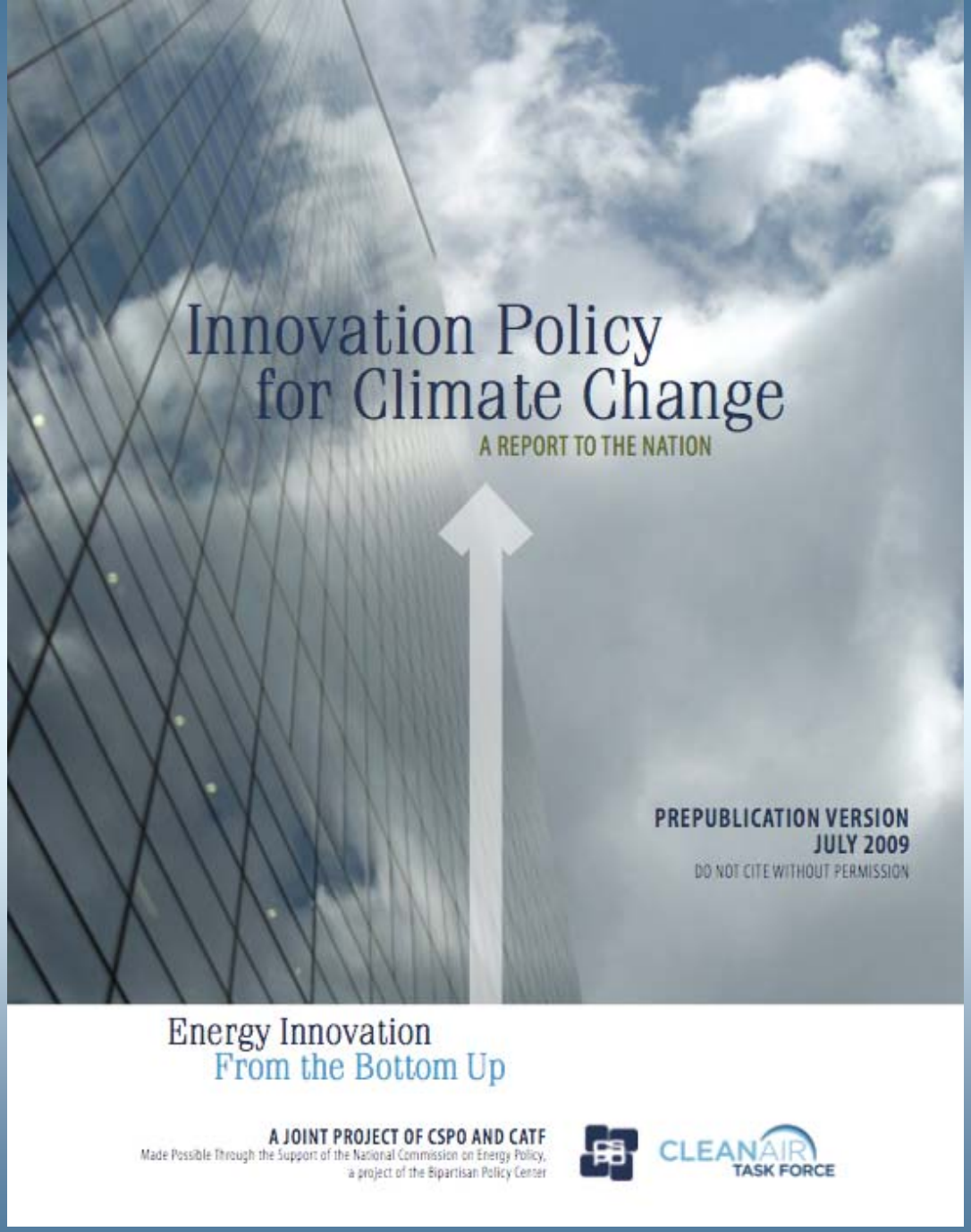
To stimulate commercialization, **policies must focus much more effectively on demonstration and scale-up** of potentially important technologies. Industry participation is essential. Agencies with more experience conducting or managing demonstrations, such as the Department of Defense, should be considered as possible competitors to DOE.

Recommendation 3

To advance greenhouse-gas-reducing technologies that lack a market rationale, **government must adopt a public works approach to deployment**. The public works model opens the way for assigning tasks to a new array of DOE competitors, including public agencies, public-private partnerships, and firms operating under government contract.

Recommendation 4

To catalyze adoption, innovation, and markets, **government must become a large-scale purchaser** and guarantor of clean energy technologies that are not yet price-competitive. Government procurement can help to create early markets, drive competition, and stimulate rapid incremental innovation in private sector.



Full report to be released in mid-August.

Pre-publication version available at www.cspo.org/projects/eisbu/pre-publicationreport.pdf

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