Less Certain Than Death: Using Tax Incentives to Drive Clean Energy Innovation

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- Independent, nonpartisan research and education institute focusing on intersection of technological innovation and public policy, including:
  - Innovation and competitiveness
  - IT and data
  - Telecommunications
  - Trade and globalization
  - Life sciences, agricultural biotech, and energy
- Formulates and promotes policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress
- World’s top think tank for science and technology policy, according to the University of Pennsylvania’s authoritative *Global Go To Think Tank* Index
Contents

1. Tax Incentives for Innovation
2. Case Studies: What the Record Shows
3. Principles
Carbon Price and Technology Incentives: Two Tools for Two Jobs

- Carbon price is like sandpaper
  - Broad impacts
  - Incremental innovation
- Tax incentives are like a saw
  - Targeted impacts
  - More radical innovation
- Example: Fuel taxes in Europe
“Real Money”

- Two waves
- FY17 cost = $18 billion
  - Wind PTC = $5 billion
  - Solar ITC = $2.5 billion
- Reference points:
  - DOE energy R&D = $7 billion
  - Estd. federal & state support for fossil fuel production = $15 billion

Source: CRS, March 2019
**Timing Matters**

- **Policy sequence**
  - R&D funding
  - Demonstration/validation
  - Tax incentives
  - Carbon price

- **Tax incentive pathologies**
  - Too early
  - Too late
Timing Matters

- Policy sequence
  - R&D funding
  - Demonstration/validation
  - Tax incentives – take-off phase
  - Carbon price

- Policy mistakes
  - Too early
  - Too late
Stability Matters, Too

- **Successful takeoff**
  - Long-lived investment
  - Accumulated experience

- **Potholes on the runway**
  - Uncertainty
  - Retroactive extensions
  - Lapses

Source: Frazier, Marcy & Cole, 2019
Contents

1. Tax Incentives for Innovation
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## Power, Buildings, Cars—Oh My!

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### Criteria

- Duration
- Value
- Beneficiary
- Manufacturer cap
- Assignability
- Executive oversight
What Did We Get Right…

• Complementary policies
• Technology-neutral
• Performance-based
• Continuous improvement
What Did We Get Wrong…

- Expire, reinstate, repeat
- (Mis)aligned incentives
- Lack of analytic rigor
- One size fits all
Contents

1. The Energy Innovation Imperative in Manufacturing
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Principles

1. Apply tax incentives when clean energy technologies are approaching readiness for large-scale adoption—not before—and remove them after the target technology has had a fair chance to establish a strong user base.

2. Absent a carbon price or other overarching climate policy, apply a tiered incentive system that provides next-generation, emerging clean-energy technologies with a more-generous incentive than it does for already widely deployed technologies.

3. Set the broad framework for tax incentives through the legislative process, but delegate detailed decisions about eligibility and duration to the executive branch.

4. Reward risk-taking by targeting tax incentives at early adopters, benefiting the innovators that offer these early adopters the most compelling products.

5. Use the whole policy toolbox and the right policy tool for each task to ensure that low-carbon energy innovations mature as quickly as possible.
Thank You!

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