Incentivizing Carbon Utilization Research

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I. Different policies

II. Considerations in selecting among policies

III. Fitting policies to circumstances

IV. Some hybrid possibilities

I. Policies to incentivize innovation

1. Grants
2. Tax credits
3. Prizes
4. Patents

1. Grants

Upfront payments provided before anything of value is produced, if ever

Offset costs

Best where R&D or construction costs will be high

Centralized decisions select “winners”

2. Tax credits

Expenditures for R&D reduce taxes

Offset costs (lower tax liability)

Usually require current income to gain benefit

Receive benefit before innovation

3. Prizes

Reward pre-specified innovation

Rules must be:

- Clearly articulated in advance
- But remain flexible

Generate attention and interest

Prizes

Innovators must obtain their own funding

Valuing the prize can be difficult

Attract wider pool of applicants

Work best when the goal is clear but the path is not

4. Patents

Provide exclusive rights to inventions' use

"Payment" received as monopoly prices during the patent term (20 years)

Require disclosure of the invention

Patents

Payments are determined by:

The government sets the ground rules to receive patents (novel, nonobvious, useful)

The market determines the actual reward (sales or licenses)

Users pay higher prices

II. Additional considerations

Asymmetry of market information

- Private parties have superior information to governments
- Patents and tax credits are superior when information is asymmetric

Markets and rewards:

Patents and tax credits require markets to value innovations accurately

Prizes and grants support innovations with limited market value but societal benefit

III. Selecting Among Policies

Key Questions

1. Who decides the amount of the reward?

    A "decider" or markets

2. When is the reward provided?

    Before or after innovation

3. Who pays the cost?

   Taxpayers or consumers

4. Who are the likely innovators?

   Identifiable or not

Optimal Application

Grants – the government can evaluate the costs, and funding is needed early

Tax credits – the government cannot evaluate projects, and market signals are reliable

Optimal Application

Prizes – the government can set a clear goal and prize amount, but not all innovators are identifiable

Patents –the government is poorly suited to select winners, and innovators have access to capital

IV. Hybrids

Combine policies, e.g.,

- Tax credits/grants + patents
- Tax credits/grants + prizes
- Prizes + patents

Hybrids

Shorten patent terms

All utility patent terms are 20 years

Shorter terms would:

Make inventions available sooner

Increase the rate of innovation

Hybrids

Utilize patent boxes

- Patent income taxed at a lower rate
- Could compensate for shorter patent terms

Time for Questions

- yours or mine!