Capturing Investment: Policy Design to Finance CCUS projects in the US Power Sector

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Deep decarbonization requires CCUS

CCUS reduces cost, reduces risk, and provides options today for any climate target.

Source: IEA WEO

The issue today is not COST
The issue today is FINANCE, which is a policy issue.
Key findings to design policy to finance CCUS deployment in the U.S. power sector (existing fleet)

Findings for project finance

- Existing policies, notably 45Q tax code amendments, are insufficient to ignite investment in the power sector.

- For each MWh generated, 45Q provides more support because coal produces more CO₂ than gas.

- The ownership structure of any potential power plant strongly affects the financeability of a CCUS retrofit project.

- Revenue enhancements, especially production tax credits, provide the lowest risk and best chance of deployment, especially for natural gas power plants.

- Because coal CCUS projects are larger and more capital intensive, capital treatments provide better support for coal retrofits.

- Non-financial policies, such as investment in innovation and pipeline infrastructure, would help reduce risk and cost and activate deployment.
Energy policy closes the finance gap

Figure 2: Finance gap associated with a power plan CUS project

Note: For any given project, higher power prices are needed to generate the revenues needed for profitability.
Source: Authors’ computation
Many policy options could close the finance gap

Key options are active today in the US, overseas, or in draft legislation

Capital treatments
- Investment tax credits
- Private activity bonds
- Accelerated depreciation
- Master Limited Partnership treatments

Revenue Enhancements
- Existing (recent) 45Q amendments
- Enhanced 45Q (higher values)
- Production tax credit
- Contract for differences

We examined two key plant types (coal & gas)
We examined two ownership structures (IOU & IPP)

These 4 classes represent ~50% of US power generation
We used baseline power prices *without CCUS* to quantify the finance gap for a CCUS retrofit.

The ownership structure affects the baseline power price needed to give investors a return.

**Figure 3:** Required power price per MWh for unabated assets.

Source: Energy Information Administration, 2019.
Today’s 45Q tax credits value: $10/MWh for gas plants
$20/MWh for coal plants

For comparison, the wind production tax credit paid for existing projects in 2017 was $24/MWh.

New projects in 2018 would receive $18/MWh.

Figure 4:
Required power price per MWh for retrofitted assets with 45Q
For natural gas power plants, the production tax credit gives the most robust returns with lowest risk.

Figure 5: Required power price per MWh for retrofitted assets with 45Q

Average US Power Prices

Unabated IOU

Unabated IPP

NGCC IOU

NGCC IPP
For coal-fired power plants, the ITC and other capital treatments help when combined with 45Q

Figure 6: Summary of rates for combined incentives for coal IOU and IPP plants
Recommendations

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• Policy makers must augment current policies to achieve deployment of CCUS in the power sector.

• Policy makers should consider stacking multiple policies to ignite investment in power sector CCUS projects.

• More analysis is needed to understand investment viability given variations by geography, market, and technology.

Non-finance policies (e.g., infrastructure and innovation) can help but are not substitutes

The goal should be rapid emissions reduction through rapid deployment
Thank You