

# IMPACT OF 45Q TAX CREDITS

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Shannon Angielski, Executive Director

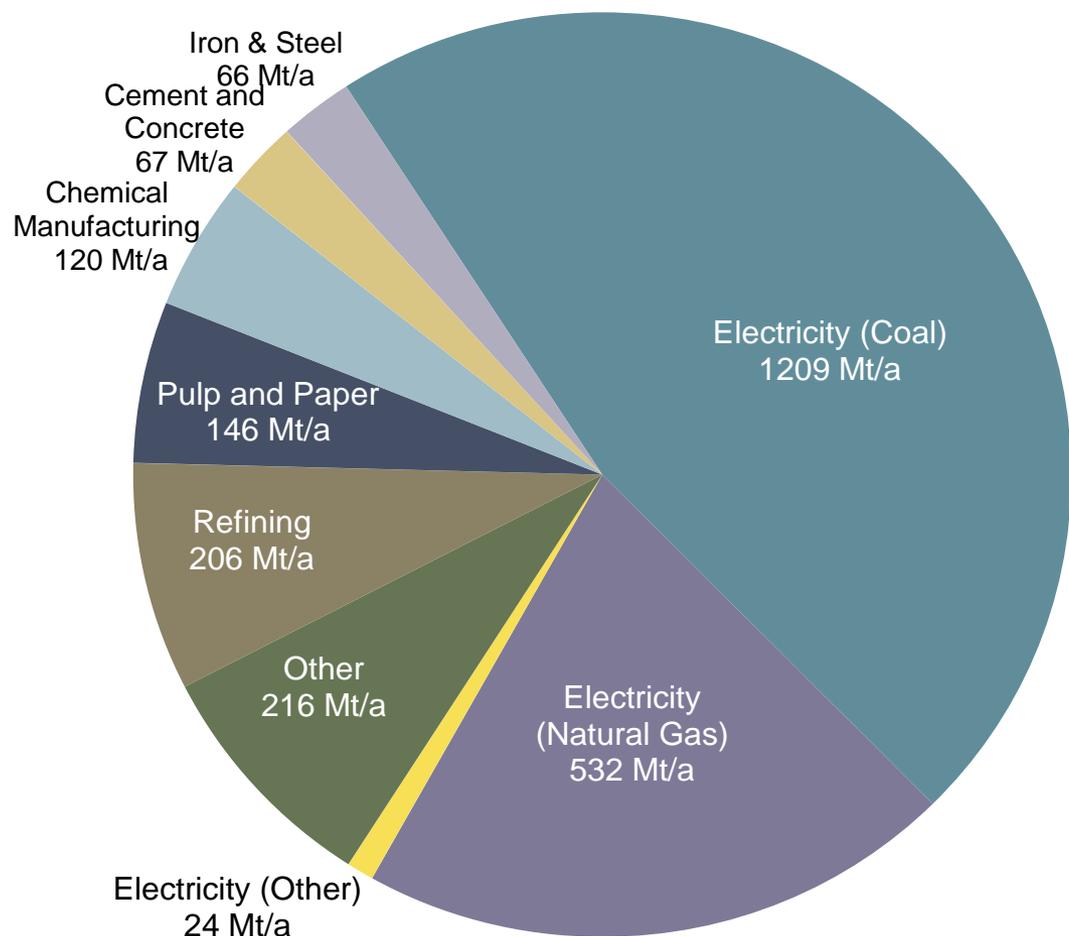
CCS 101 Briefing Series, Briefing #4

**The Status of Carbon Capture - *Where are we now?***

Rayburn House Office Building, Room 2325

June 25, 2019

# U.S. CO<sub>2</sub> Emissions by Sector (2017)



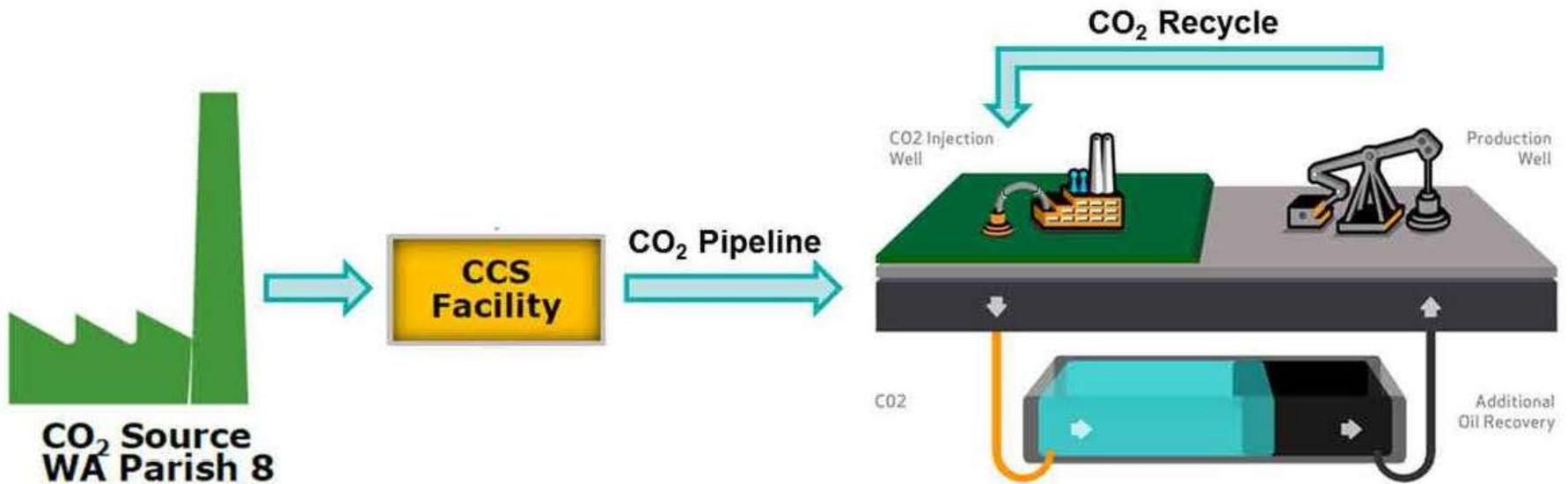
POWER GENERATION  
ACCOUNTS FOR 68% OF CO<sub>2</sub>  
EMISSIONS FROM  
INDUSTRIAL SOURCES

FROM POWER GENERATION,  
THE MAKEUP OF CO<sub>2</sub>  
EMISSIONS: COAL 69%,  
NATURAL GAS 30%

Source: Electric Power Research Institute (EPRI)

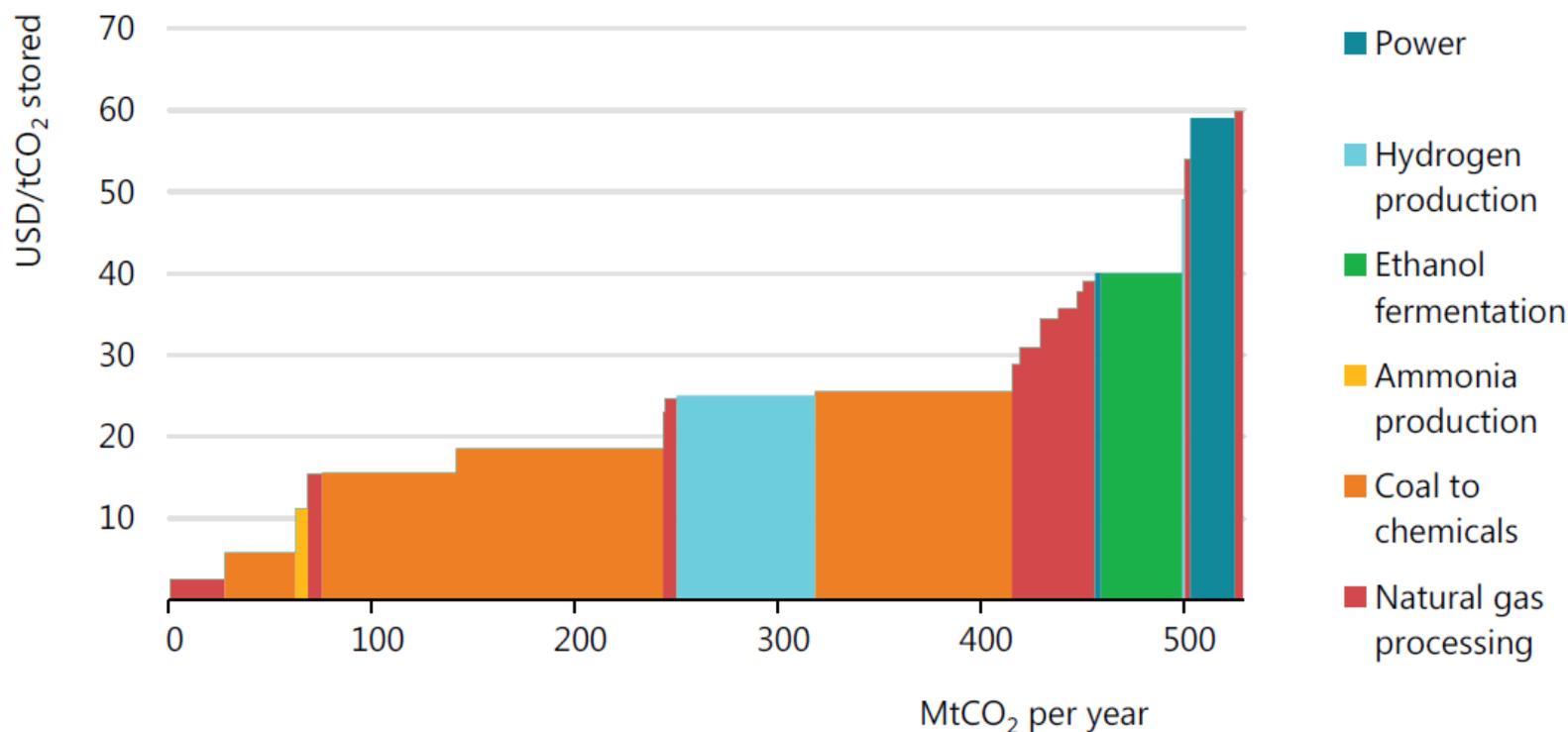
Source: EPA GHGRP 2017 data by point sources

# Carbon Capture, Transport, Utilization and Storage



# First-of-a-kind CCS Costs In Different Industries

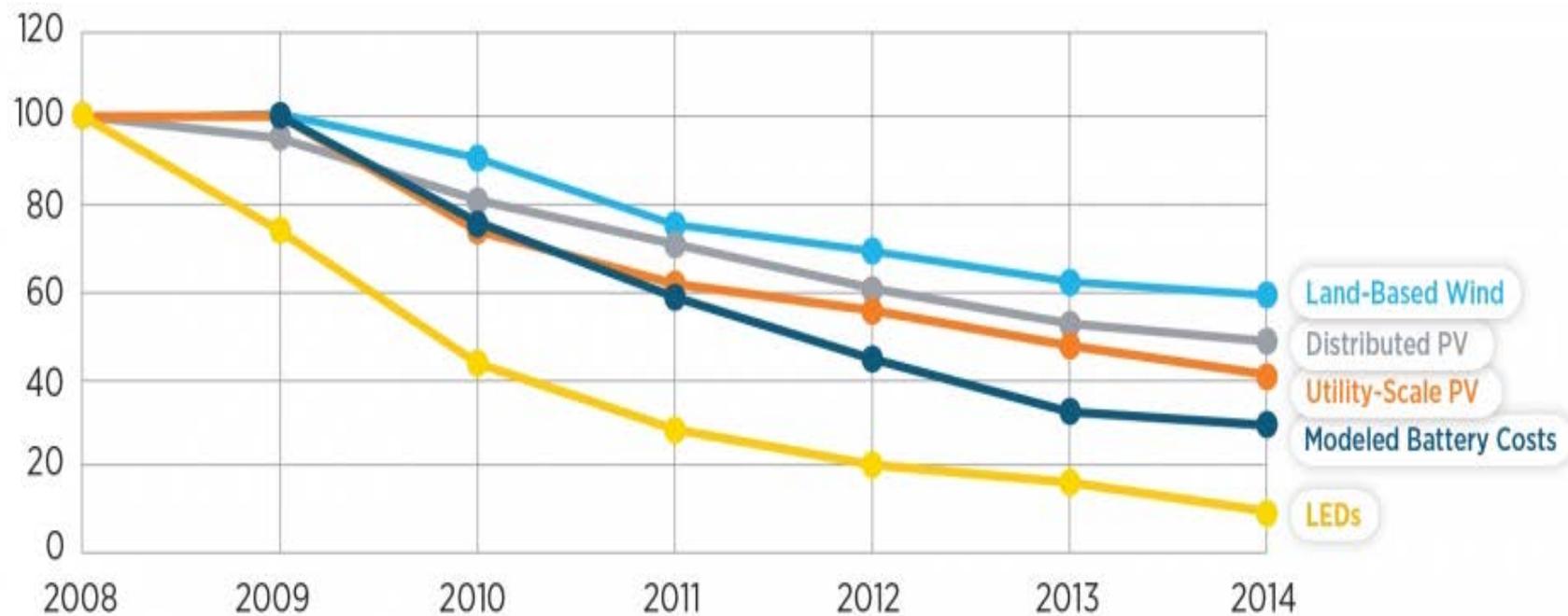
Figure 39. Break-even costs for CO<sub>2</sub> capture and storage by application



Source: IFA (2019). All rights reserved.

# CCS Costs Can Come Down with Aggressive and Sustained Policy Support

As witnessed by the deployment curve with renewable energy technologies, we know that the costs for CCS – when coupled with policies to support their successive application into the commercial market – will reduce over time and make CCS competitive in the marketplace.



***Each of these technologies has dropped 40-90% in cost in the U.S. since 2008***

# FUTURE ACT of 2018:

## 45Q Carbon Sequestration Tax Credits

- Functions like a production tax credit, with a \$/ton value for CO<sub>2</sub> or CO<sub>x</sub> captured and stored - *creates certainty for financial investment*
- Makes credit available through January 1, 2024 (commence construction) - *creates certainty for financial investment*
- Credit claiming period is 12 years
- Increases credit values over a 10 year escalation period to:
  - \$35/ton for Enhanced Oil Recovery (EOR)
  - \$50/ton for Geologic Storage
  - \$35/ton for CO<sub>2</sub> or CO<sub>x</sub> Captured and Utilized (CO<sub>2</sub> conversion and not emitted)
- Direct air capture an eligible technology - **New**
- Can assign tax credit to other entities involved in the project - *helps to fully monetize the tax credits within the project*
- Modifies eligibility criteria:
  - Shifts from industrial emitter to CO<sub>2</sub> capture equipment owner - *helps to fully monetize the tax credits within the project*
  - CO<sub>2</sub> Thresholds
    - Maintains 500,000 tons of CO<sub>2</sub> for EGUs
    - 100,000 tons for industrial emitters
    - 25,000 tons for pilot projects in which the CO<sub>2</sub> is stored in a utilization project

*Helps to Reduce the Cost of Carbon Capture projects*

# Impact of 45Q Tax Credits

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## ● Environmental Impacts

- According to GCCSI, the U.S. is currently capturing ~30 million tons of CO<sub>2</sub> per year.
- The 45Q tax credits have the potential to double or triple the amount of CO<sub>2</sub> captured and stored each year with the deployment of new carbon capture projects.
- The program will also launch direct air capture projects which the UNIPCC has indicated will be necessary to achieve the below 2°C scenario.

## ● Economic Impacts

- Investment in projects will stimulate growth in the carbon capture industry, which will create jobs and result in macro-economic benefits:
  - CO<sub>2</sub> utilization markets – Study estimates \$1 trillion in new domestic CO<sub>2</sub> product markets per year, \$5.9 trillion globally per year (Carbon180)
  - “Making Carbon a Commodity” – Study estimates 270,000 to 780,000 new jobs and \$65 to \$190 billion increase in GDP (CURC & ClearPath)

# Impact of 45Q Tax Credits

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## ● Investment Impacts:

- A new 45Q tax credit market is incentivizing investment opportunities for financial institutions as well as other types of investors
- Similar trends resulted from renewable energy tax credits where a new financial market emerged for financing renewable energy projects due to the federal program
- 45Q is resulting in financial institutions evaluating carbon capture projects
- This will create mechanisms within financial investment toolbox with improved efficiencies for investment
  - Will act to reduce investor uncertainty and help to minimize risks from investing in carbon capture projects

## ● Example projects discussed on following slides

# Impact of 45Q on Ethanol and EOR

- Occidental Petroleum and White Energy Studying Carbon Capture from Ethanol Project for use in EOR in Texas:

“The collaboration between Occidental and White Energy is a direct result of the passage of the FUTURE Act,” - Occidental Petroleum President and CEO Vicki Hollub.

<https://www.oxy.com/News/Pages/Article.aspx?Article=5970.html>



# Impact of 45Q on Existing Coal Plants

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- Project Tundra is proposing to add carbon capture on an existing coal plant (Milton R. Young Station, Unit 2) in North Dakota that would potentially capture and store between 2.3 and 3.6 million tons of CO<sub>2</sub> annually.

## Project Tundra Partners:

Minnkota Power  
Cooperative, Square Butte  
Electric, BNI Energy (an  
Allele Company)



# Example Projects in Development that will Benefit from the 45Q Tax Credits

- Oxy Low Carbon Ventures investment in NET Power's carbon capture technology:
  - “NET Power sees a large, global demand for its technology, made even greater by the passage of 45Q carbon capture tax credit reform in the U.S.” See press release: <https://www.oxy.com/News/Pages/Article.aspx?Article=6020.html>



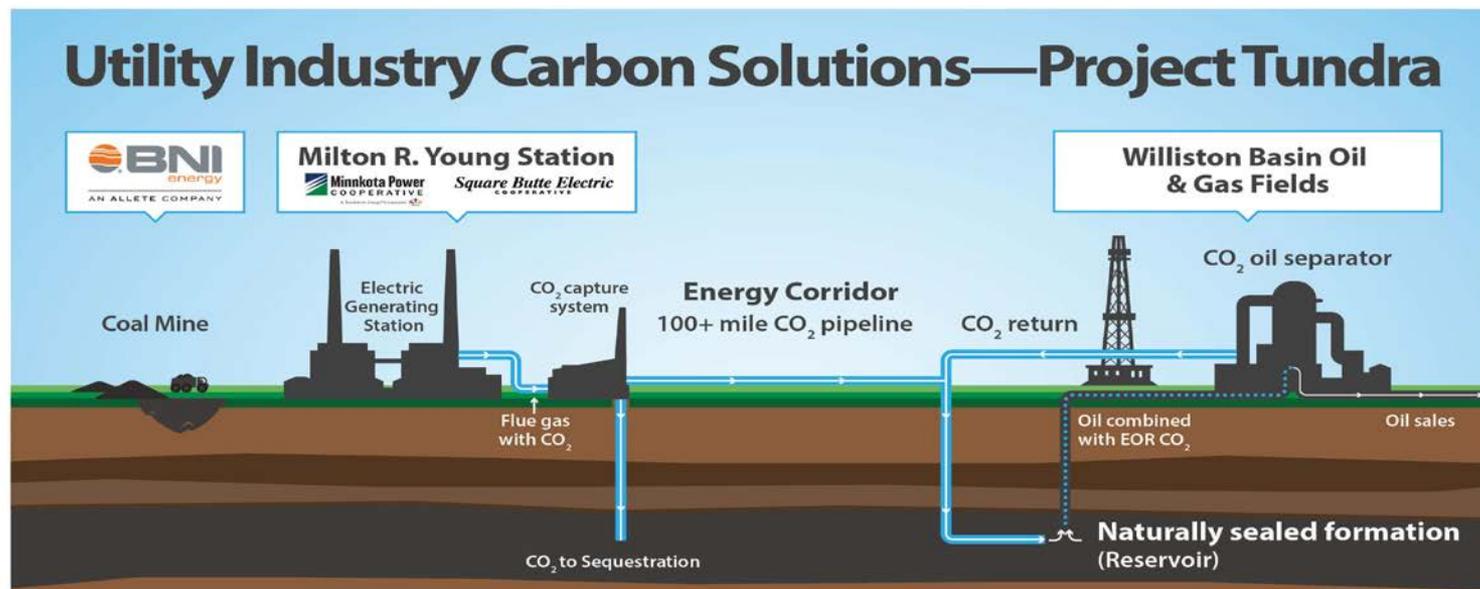
# Impact of 45Q on Direct Air Capture – Carbon Engineering

- Oxy Low Carbon Ventures and Carbon Engineering announced they will engineer the world's largest direct air capture and sequestration plant

– May 21, 2019: [Oxy Low Carbon Ventures and Carbon Engineering begin engineering of the world's largest Direct Air Capture and sequestration plant](#)



# Example Carbon Capture Project Timeline



## Project Roadmap:

### Key Technology Improvements:

Addressing the key technical challenges from recent projects to improve efficiency and performance.

### Project Feasibility

Advance technology, partnerships and funding.  
Federal and State funding, and tax credit support.

### Initial Design, CO<sub>2</sub> for EOR and Sequestration:

Project design and assessment of CO<sub>2</sub> for EOR and sequestration.  
Federal and State funding for FEED and pilot work.

### Large Pilot Testing and FEED:

FEED for full project and arrangements for CO<sub>2</sub> offtake sequestration.  
Large flue gas pilot testing at MR Young Station, if needed.  
Finalize full Federal and State support.

### Commercial Application:

Detailed engineering, procurement and construction.  
Operation and affirmation of capture, EOR and sequestration solutions for industry.

## Timeline and Cost Estimate:

2015-2016  
\$1 million

2016-2017  
\$1 million

2018-2019  
\$30 million

2020-2021  
\$100 million

2022-2024  
\$1.3 billion

# Timing of 45Q Tax Credits – Expiration Date

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- CCS projects are large, capital intensive projects, and have much longer lead times for development to construction (when compared to renewable projects)
- Over 16 months have passed since the program was enacted in February of 2018 and there is still no guidance to know the “rules” of the game
- IRS guidance on how it will implement the new program is needed for there to be clarification and certainty on how to use the credits within a project, which is also necessary to attract private sector investment in projects

# Additional Federal Programs and Pending Carbon Capture Legislation

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- Existing DOE Fossil Energy Loan Guarantee program
- Legislation authorizing new and robust Fossil Energy RD&D programs that emphasize CCUS:
  - *Enhancing Fossil Fuel Energy Carbon Technology (EFFECT) Act (S. 1201)*
    - Sen. Joe Manchin (D-WV), Sen. Lisa Murkowski (R-AK)
  - *Fossil Energy Research and Development Act of 2019* to be introduced
- *Utilizing Significant Emissions with Innovative Technologies (“USE IT”)* Act (S. 383 / H.R. 1166), streamlining CO<sub>2</sub> pipeline infrastructure to help catalyze a CCUS industry
  - Sen. John Barrasso (R-WY), Sen. Sheldon Whitehouse (D-RI); Rep. Scott Peters (D-CA), Rep. David McKinley (R-WV)
- *Carbon Capture Modernization Act (S. 407 /H.R. 1796)*, modifying existing investment tax credits for carbon capture on coal plants
  - Sen. John Hoeven (R-ND), Sen. Tina Smith (D-MN); Rep. David McKinley (R-WV), Rep. Colin Peterson (D-MN)

# Additional Federal Programs and Pending Carbon Capture Legislation

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- Legislation designed to help reduce the cost of financing carbon capture projects:
  - *Financing Our Future Energy Act* (S. 1841 / H.R. 3249), allowing new entities to form master limited partnerships (MLPs), including carbon capture projects
    - Sen. Chris Coons (D-DE)
  - *Carbon Capture Improvement Act* (S. 1763), allowing businesses to use private activity bonds (PABs) issued by local or state governments to finance CCUS projects
    - Sen. Michael Bennet (D-CO), Sen. Rob Portman (D-OH)

# Thank You and Questions

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