

# FEDERAL INITIATIVES TO PROMOTE CCUS DEPLOYMENT

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Carbon Utilization Research Council  
VCEA/SSEB Annual Conference & Expo  
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# Carbon Utilization Research Council (CURC) Members

## Coal Producers

Arch Coal, Inc.  
Cloud Peak Energy Resources LLC  
Lignite Energy Council  
Peabody Energy

## Equipment Suppliers

General Electric  
Mitsubishi Heavy Industries America,  
Inc. (MHIA)

## Labor Unions

International Brotherhood of Boilermakers  
International Brotherhood of Electrical  
Workers

## NGOs

ClearPath Action  
EnergyBlue Project

## State Organizations

Southern States Energy Board  
Wyoming Infrastructure Authority

## Research Organizations

Battelle  
Electric Power Research Institute (EPRI)  
Gas Technology Institute  
University of North Dakota Energy &  
Environmental Research

## Technology Developers

ION Engineering  
Jupiter Oxygen Corporation  
NET Power

## Trade Associations

American Coal Council  
American Coalition for Clean Coal  
Electricity (ACCCE)  
Edison Electric Institute (EEI)  
Energy Policy Network  
National Rural Electric Cooperative  
Association (NRECA)

## Universities

Lehigh University  
Ohio State University  
Pennsylvania State University  
Southern Illinois University  
University of Illinois/PRI  
University of Kentucky/CAER  
University of Wyoming  
West Virginia University

## Utilities

Basin Electric Power Cooperative  
Duke Energy Services  
LG & E and KU Services  
Company  
Southern Company  
Tri-State Generation &  
Transmission Association

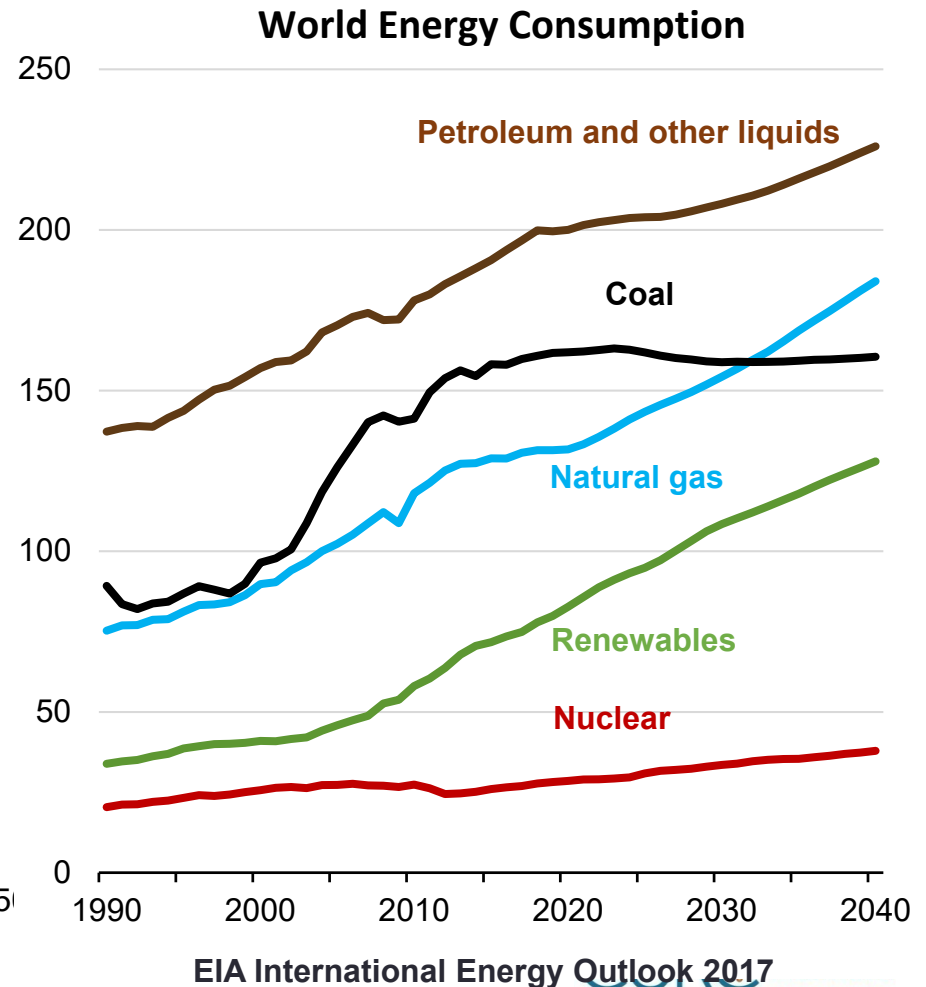
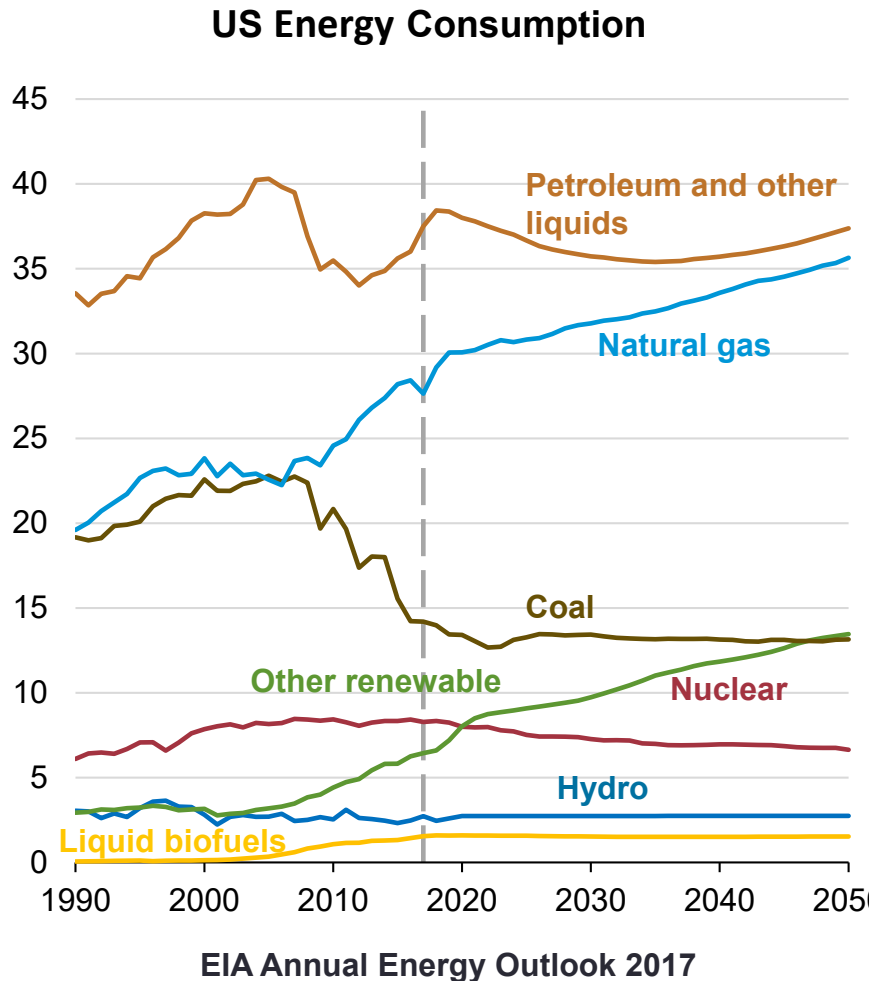
Companies in orange indicate  
Steering Committee Members

# Why Do We Need CCUS?

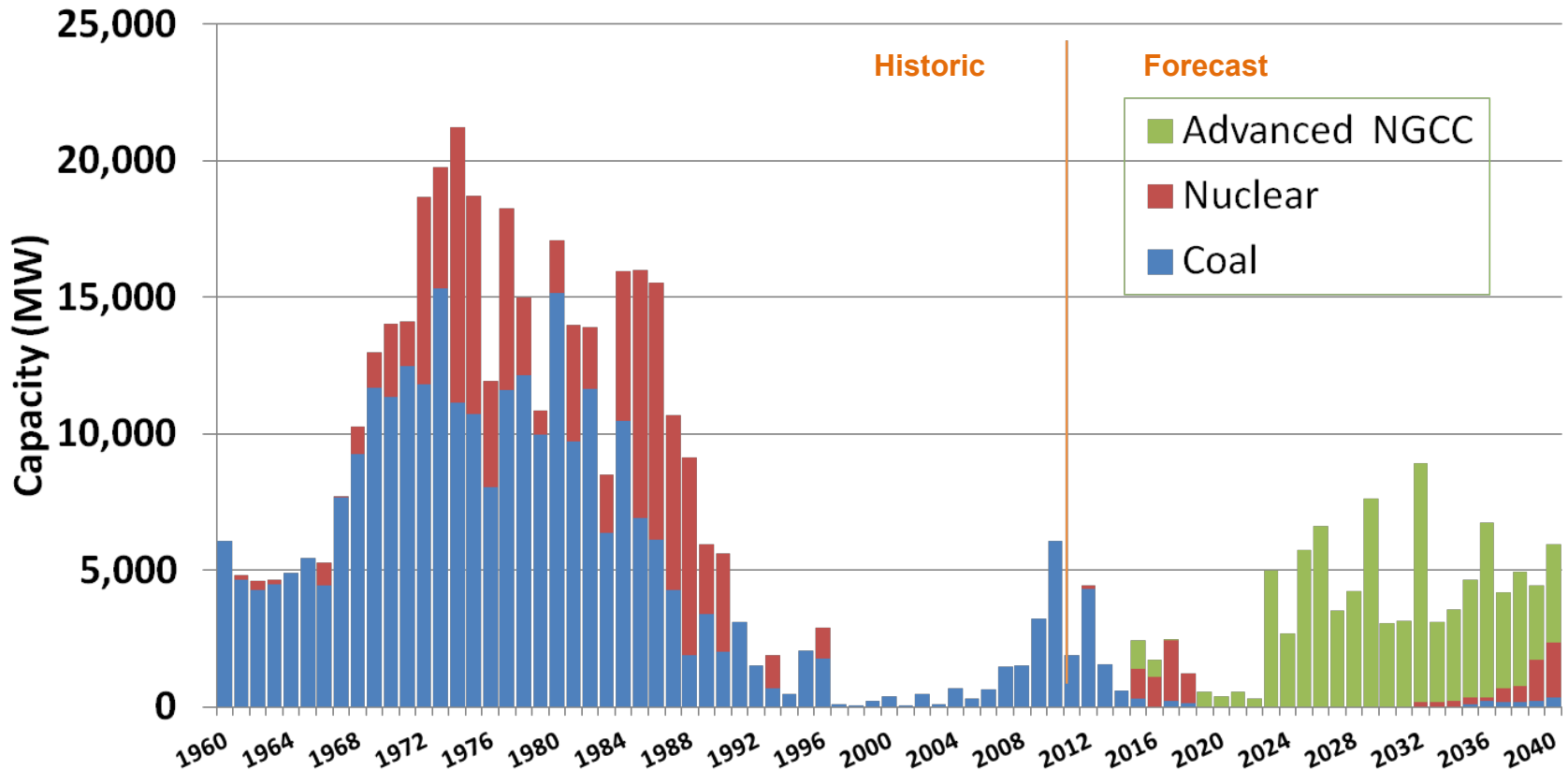
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- Growing domestic and international fossil fuel use
- Need to maintain affordable, reliable electricity while reducing power sector emissions
- Development of CCUS could lead to major return on investment for domestic economy and global climate

# U.S and World Energy Consumption by Fuel Source (quadrillion Btu)



# EIA's Projection: Modest to No New Coal Through 2040

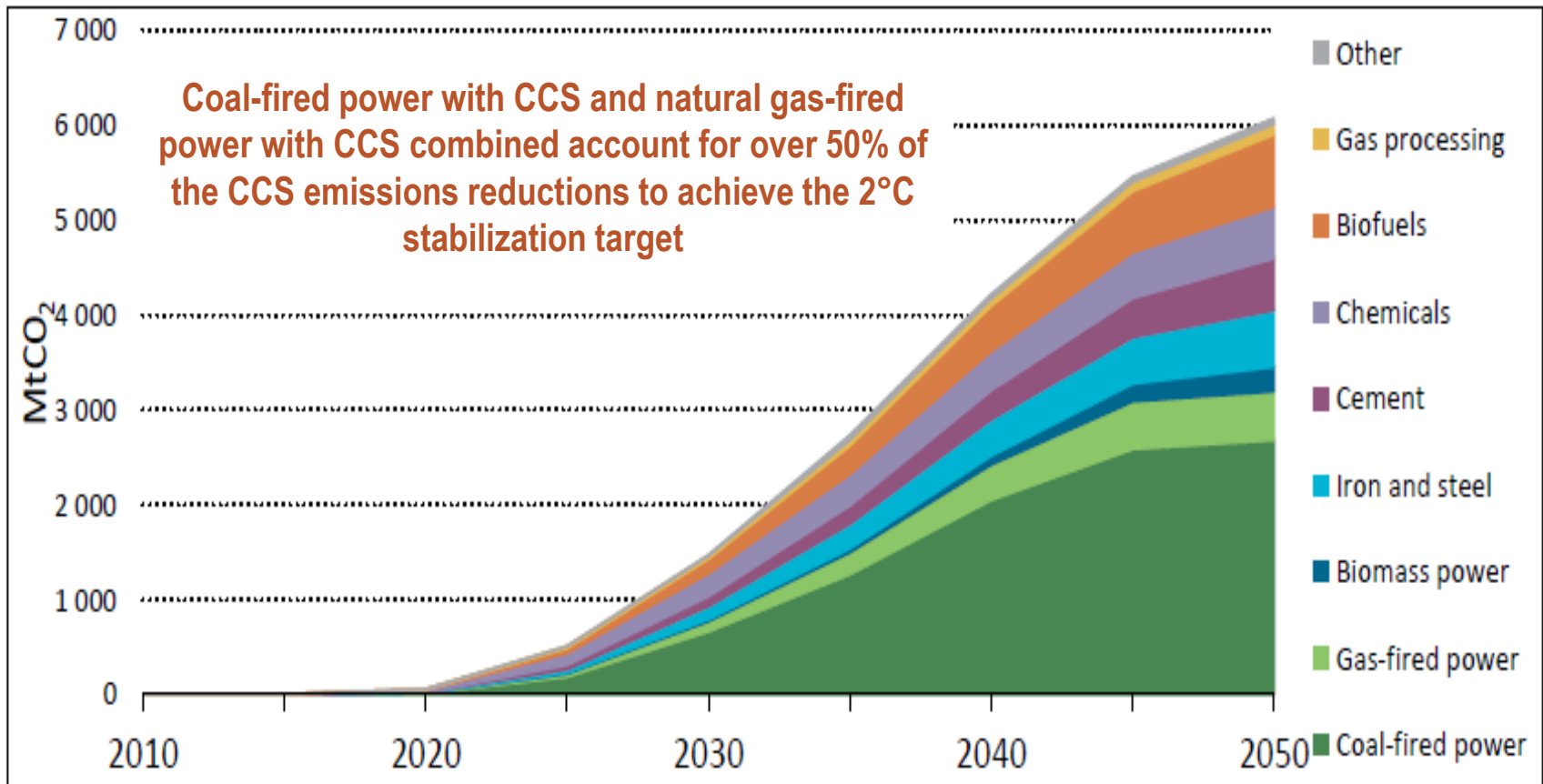


**Yet EIA projects that the existing coal fleet will generate 38% of electricity generation in 2040 when it is on average 60 years of age?**

# Forces Impacting Power Sector Technology Innovation in the U.S.



# Global Carbon Capture by Industry to Achieve 2° Scenario



Source: Derived from *Energy Technology Perspectives 2016* (IEA, 2016).

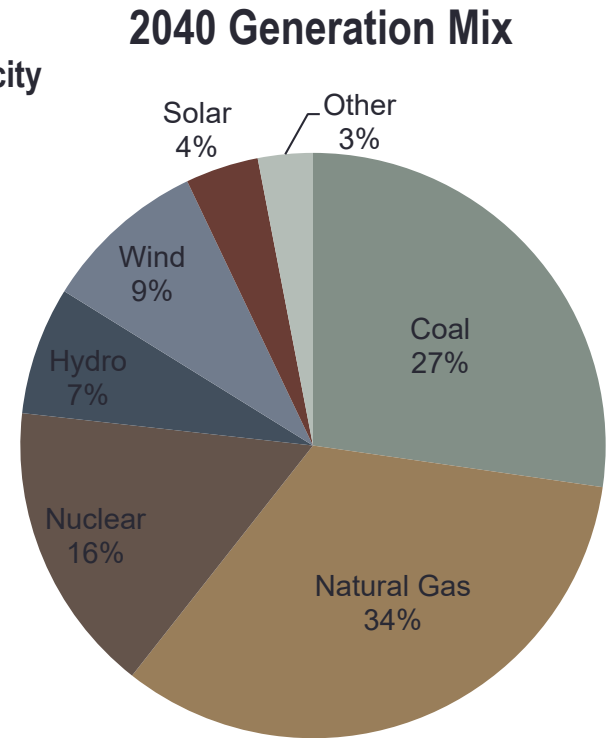
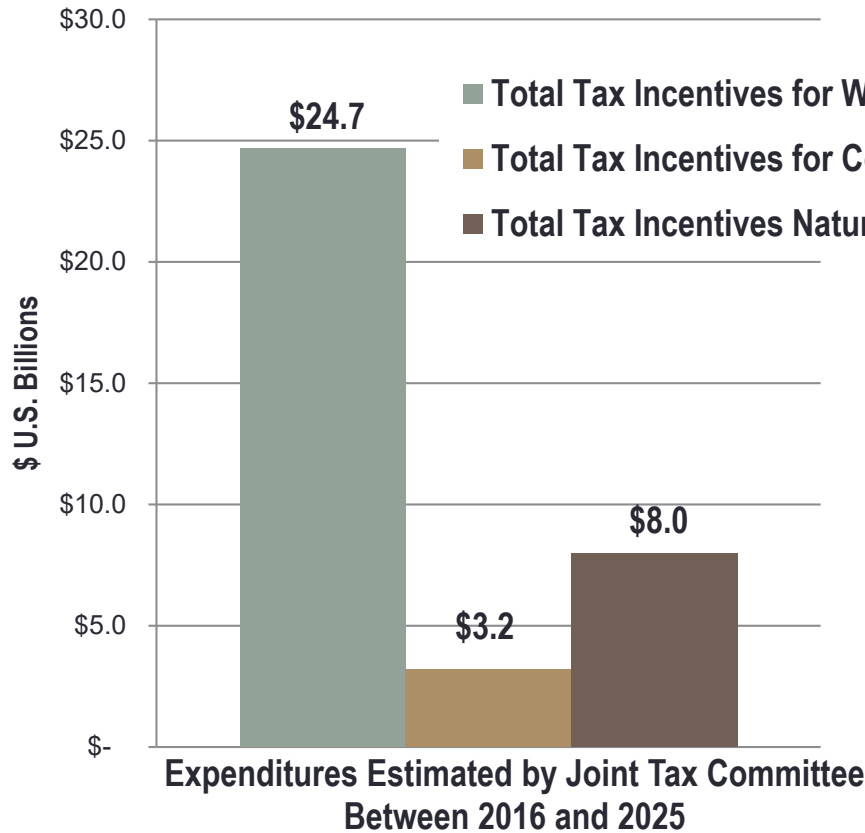
# Why Has Carbon Capture Not Been More Broadly Deployed?

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- CCUS projects are capital-intensive and cannot yet compete against lower cost and subsidized forms of electricity
  - Significant financial and policy support over 20 years for wind and solar power → commercial viability
- Section 45Q tax credit reform was important first step, but will not be enough to incentivize CCUS deployment on its own
- **Aggressive, comprehensive policy support will be needed in order to accelerate the development and deployment of CCUS.**



# Tax Incentives for Wind Compared to its Contribution to Electric Power Generation in 2040



Source: EIA AEO 2018

Wind Incentives - Electricity production and investment tax credit for wind

Coal Incentives - Expensing of exploration and development costs, excess of percentage depletion over cost depletion, capital gains treatment of coal royalties, credit for investment in clean coal facilities, and Indian coal production credit.

Natural Gas Incentives - Natural gas distribution pipelines treated as 15-year property, expensing of exploration and development costs, and excess of percentage depletion over cost depletion.

# CURC Federal Policy Efforts

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- Comments on regulatory initiatives:
  - Affordable Clean Energy (ACE) Rule for under Clean Air Act Section 111(d) for existing EGUs
  - Carbon Pollutions Standards Rule under Clean Air Action Section 111(b) for new and modified sources
  - IRS implementation of Section 45Q tax credit reform
- Legislative initiatives:
  - Section 48A tax credit legislation
  - Fossil Energy reauthorization legislation
  - USE IT Act
  - Annual appropriations
- Educational initiatives:
  - Carbon Capture 101 Briefing Series

# Regulatory Initiatives – 45Q Implementation

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- Section 45Q reform passed via the Bipartisan Budget Act of 2018 (February 2018)
- Issues CURC raised for guidance:
  - Define “commence construction” for eligibility of tax credit similar to the renewable tax credit definition, but modify for large, capital intensive, carbon capture projects
  - Define “carbon capture” to include all equipment including transport, EOR and storage equipment.
  - Clarify - as per the statute - that the all or part of the tax credit is transferable to others in the project.
  - In developing the “recapture” provisions, ensure certainty of recapture through a time limitation, de minimis rule, or offset rule.
  - Undertake rulemaking to define “secure geologic storage” requirements
- IRS issued RFI earlier this month, interim guidance may be released soon

# CURC Legislative Initiatives

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- Reform 48A advanced coal with carbon capture investment tax credits
  - Carbon Capture Modernization Act (S. 407 / H.R. 1796)
    - Senators John Hoeven (R-ND) and Tina Smith (D-MN); 7 additional bipartisan cosponsors
    - Congressmen David McKinley (R-WV) and Collin Peterson (D-MN); 7 additional bipartisan cosponsors
- RD&D Reauthorization Legislation
- USE IT Act

# Legislative Initiatives: Section 48A Tax Credit

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- The Section 48A investment tax credit or “Credit for Investment in Clean Coal facilities” established in the Energy Tax Incentives Act (ETIA) of 2005.
- In 2008, Congress expanded the credit through the Energy Improvement and Extension Act (EIEA)
- Disconnect between original 2005 credit and 2008 revision
  - CCS projects on a new or existing plant cannot technically improve their efficiency; adding CO<sub>2</sub> capture reduces the efficiency of a new or existing plant
  - The Section 48A tax credit has not incentivized CCS on new non-IGCC or any existing coal plants.

# Legislative Initiatives: Section 48A Tax Credit

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- Carbon Capture Modernization Act

- S. 407 – Introduced by Sens. John Hoeven (R-ND) and Tina Smith (D-MN) → 8 bipartisan cosponsors
- H.R. 1796 – Introduced by Reps. David McKinley (R-WV) and Collin Peterson → 9 bipartisan cosponsors

- Bill would modify 48A credit by:

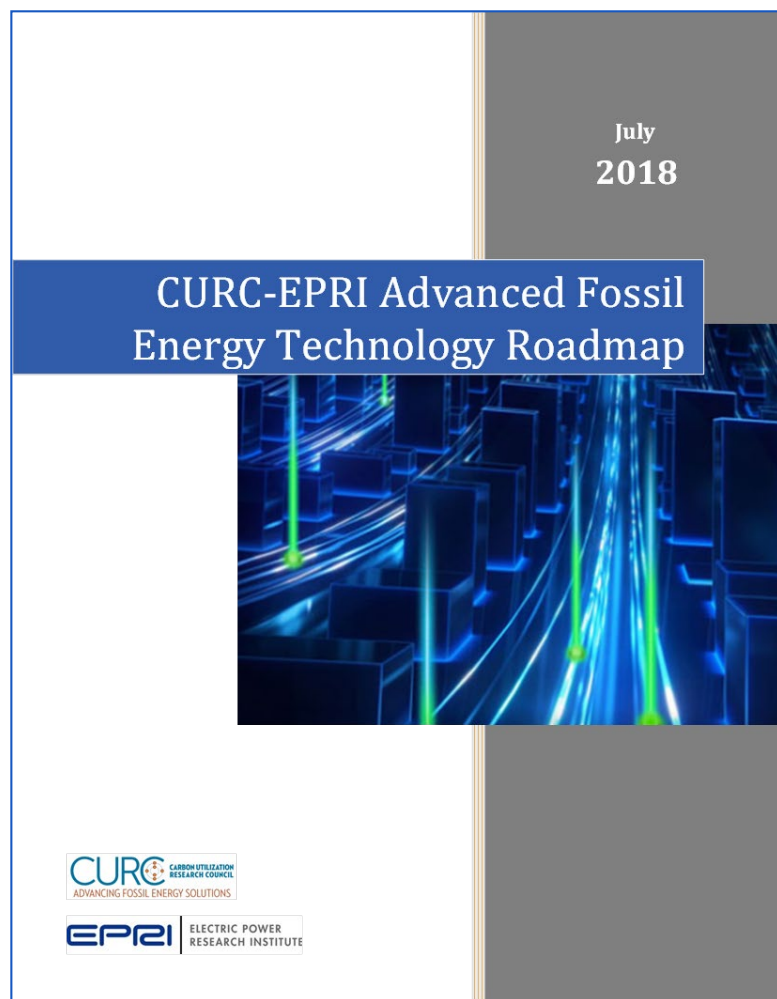
- 1) Removing the efficiency requirements to be eligible for the tax credit if a project will have CO<sub>2</sub> capture.
- 2) Specifically directing the Secretary of the Treasury to conduct additional rounds of applications to reallocate any available Sec. 48A credits.
- 3) Lowering the minimum size threshold from 400 MW to 200 MW.
- 4) Lowering the CO<sub>2</sub> capture percentage requirement for an existing unit from 65% to 60% (a new unit would have to meet the original requirement).
- 5) Allowing a CCS retrofit on an existing unit that has undergone a recent best available control technology (BACT) analysis for SO<sub>2</sub> or NO<sub>x</sub> to substitute the BACT determination for the limits prescribed in the 2005 legislation.

# Legislative Initiatives: Fossil Energy Reauthorization Legislation

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- Enhancing Fossil Fuel Energy Carbon Technology (EFFECT) Act (S. 1201) introduced in Senate on 4/11/19
  - Senators Manchin (D-WV), Murkowski (R-AK), Cramer (R-ND), Capito (R-WV), Daines (R-MT), Jones (D-AL), Alexander (R-TN), Hoeven (R-ND)
  - Authorizes Coal and Natural Gas Technology RD&D program with emphasis on large-scale pilots and commercial demos, support for FEED studies; R&D&D programs for Carbon Storage, Carbon Utilization, and Carbon Removal
- Fossil Energy Research and Development Act re-introduction expected in the House in June
  - Introduced in 2018 by Reps. Marc Veasey (D-TX), David McKinley (R-WV), and Eddie Bernice Johnson (D-TX)

# The 2018 CURC-EPRI Advanced Fossil Energy Technology Roadmap



- Represents a plan for delivering cost-competitive, low to zero-carbon emission fossil-fueled technologies between 2025-2035.
- Identifies industry RD&D priorities and the public-private sector investments needed to bring technologies to the commercial marketplace.
- Informs policymakers on technology direction and annual budget needs to achieve Roadmap goals.
- Analyzes and communicates the potential benefits of U.S. fossil energy innovation.



# Legislative Initiatives: USE IT Act

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- Utilizing Significant Emissions with Innovative Technologies (“USE IT”) Act (S. 383 / H.R. 1166)
  - S. 383 introduced by Sens. John Barrasso (R-WY) and Sheldon Whitehouse (D-RI) → 14 bipartisan cosponsors
  - H.R. 1166 introduced by Reps. Scott Peters (D-CA) and David McKinley (R-WV) → 23 bipartisan cosponsors
- USE IT Act would:
  - Amend Clean Air Act to direct EPA to use existing authorities to support carbon utilization and direct air capture research
  - Clarify eligibility for CCUS projects and CO2 pipelines for FAST Act permitting review process
  - Direct CEQ to establish guidance to assist project developers and operators of CCUS facilities and CO2 pipelines;
  - Establish task forces to hear input from affected stakeholders for updating and improving guidance over time

# Legislative Initiatives: Annual Appropriations

Coal, CCS & Power Systems	FY 18 Enacted	FY19 Enacted	FY20 Request	CURC FY20
(All figures in \$ Thousands)	481,117	486,230	387,425	760,000

- Current program funding mainly for coal related R&D work – seeing push for more fuel agnostic approach from new Congress
  - FY18/19 language allows for R&D on natural gas technologies so long as it does not come at the expense of coal
- Administration’s FY 2020 budget request would fund only early stage R&D
  - CURC FY2020 testimony emphasizes need for budgets to support large pilots and demonstrations
  - FEED studies recommended and funded to address scale up of technologies

# CURC FY2020 Coal CCS & Power Systems Budget Recommendations

Coal CCS & Power Systems (All figures in \$ Thousands)	FY 18 Enacted	FY19 Enacted	FY20 Request	CURC FY20
Carbon Capture	100,671	100,671	39,800	119,000
Carbon Storage	98,096	98,096	26,000	129,000
Advanced Energy Systems	112,000	129,683	185,300	336,000
Crosscutting Research	58,350	56,350	72,825	97,000
Supercritical CO2 Technology (STEP) Program	24,000	22,430	0	24,000
Transformational Pilot Plant Solicitation	35,000	25,000	0	25,000
FEED Study Solicitations*	0	30,000	0	-
<b>Coal CCS &amp; Power Systems Subtotal</b>	<b>481,117</b>	<b>486,230</b>	<b>387,425</b>	<b>760,000</b>
Natural Gas Advanced Power Systems R&D	0	0	0	30,000

\*CURC's recommends \$50 million for FEED studies in FY 2020 within the Advanced Energy Systems Program.

# Carbon Capture 101 Briefing Series

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- Five one-hour lunch briefings to educate Congressional staff, particularly House Democrats, on basics of CCS
  - Collaborating with Global CCS Institute, Carbon Capture Coalition
- Briefing Topics
  - The Role of Carbon Capture in Achieving Energy & Climate Goals (March 28, 2019)
  - Carbon Capture Technology 101 (April 26, 2019)
    - Industrial versus power sector capture, review of post-combustion and new technologies like Allam and sCO<sub>2</sub>
  - Storing CO<sub>2</sub>, How Does it Work? (May 31, 2019)
    - Distinction between EOR and geologic storage
    - CO<sub>2</sub> utilization, direct air capture
  - The Status of Carbon Capture: Where Are We Now? (June 21, 2019)
  - Environmental and Economic Benefits of Carbon Capture (July 26, 2019)

# Thank You and Questions

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