International Pittsburgh Coal Conference

COAL POWER Report
Findings & Recommendations

Janet Gellici
Chief Executive Officer
National Coal Council

September 8th, 2020 ~ Via Webcast
Advisors to the U.S. Secretary of Energy

- Federal Advisory Committee
  - Organized under the Federal Advisory Committee Act (FACA)
  - Established in 1984
- Provides advice and recommendations to the U.S. Secretary of Energy
  - On coal policy, technology and markets
- Members
  - Appointed to serve by the Secretary of Energy
- Over 40 reports prepared to date
Mr. Dono Gray
Chairman
National Coal Council, Inc.
1101 Pennsylvania Avenue, NW, Suite 200
Washington, DC 20004

Dear Chairman Gray:

I am writing today to request the National Coal Council (NCC) develop a white paper assessing smart policies in support of advanced coal-fired power-generation technologies.

The white paper should focus on an industry perspective on the future of advanced coal technologies in the power sector, including carbon capture, utilization, and storage (CCUS); advanced energy systems to enhance energy efficiency and flexibility; high efficiency-low emissions technologies; small modular coal power plant technologies; and transformational technologies, such as supercritical CO2 cycles and pressurized oxy-combustion.

The report would address how various regulatory and legislative policies could be employed to enhance and accelerate the deployment of these technologies. The prospective policies would include, but are not limited to:

- For CCUS: 4Q Federal Tax Incentive, USE IT Act, Master Limited Partnerships, Private Activity Bonds
- EPA’s New Source Review Regulation
- Public Utility Regulatory Policies Act
- EPA Regulations on Coal Combustion Residuals and Effluent Limitation Guidelines
- Wholesale Electricity Markets
- State Initiatives and State Public Utility Commission Regulatory Oversight
- The newly-authorized U.S. International Development Finance Corporation
- Energy Infrastructure

Key questions to be addressed include:

- What regulatory and legislative initiatives could be advanced to help accelerate the deployment of coal-fired power-generation technologies?
- What coal-fired power-generation technologies would benefit from regulatory and legislative reforms?
- What energy infrastructure initiatives would support the deployment of advanced coal-fired power-generation technologies?

The report should be a comprehensive analysis of the current policy landscape and the potential for improvements to support the advancement of advanced coal technologies.

Sincerely,

Energy Secretary Rick Perry

Assess smart policies in support of advanced coal generation technologies

Power Sector Technologies
Existing & New Coal Generation
- CCUS
- Energy Efficiency/Flexibility
- HELE
- Small modular
- Transformational

Regulations & Legislation
- 4Q
- NSR
- PURPA
- CCR/ELG
- Wholesale Markets
- Int’l Development Finance Corp.
- State and Public Utility Commission

Energy Infrastructure
Report Leadership

Report Co-Chairs
Kipp Coddington
School of Energy Resources
University of Wyoming

John Harju
Energy & Environmental Research Center
University of North Dakota

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- Kipp Coddington, Univ. of Wyoming
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- Neeraj Gupta, Battelle
- Jared Hawkins, Battelle
- Josh Stanisłowski, EERC/Univ. ND

Executive Editor
- Janet Gellici, NCC

Contributors & Reviewers
- Over 50 NCC Members & Associates
Report Overview

- Executive Summary
- Chapter 1. Background
- Chapter 2. Coal Generation Technologies
- Chapter 3. Federal Regulations & Legislation
- Chapter 4. State, Regional, Tribal Initiatives
- Chapter 5. Energy Infrastructure
- Chapter 6. Recommendations
The Energy Trilemma

Source: International Energy Agency
The Value of Efficiency Improvements for Reduction of CO₂ Emissions

Potential for ~2 Gt of CO₂ savings if global average brought to state of the art

USC not strictly defined – broadly refers to use of material advances since the 1990s

Source: International Energy Agency
## Advanced Coal Generation Technologies: Deployed and Under Development

### Matrix of Technologies Related to Coal FIRST Energy Objectives

<table>
<thead>
<tr>
<th>Technology</th>
<th>Retrofit</th>
<th>New Plants</th>
<th>Flexible</th>
<th>Innovative</th>
<th>Resilient</th>
<th>Small</th>
<th>Transformational</th>
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Matrix of Technologies Related to Coal FIRST Energy Objectives
International & U.S. Deployment of Advanced Coal Generation Technologies

Worldwide Ultra-Supercritical Coal Capacity

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U.S. Installed Generation Capacity 2018

Source: International Energy Agency

Source: U.S. Energy Information Administration
Federal Support Opportunities

- Initiatives to Advance R&D
- Initiatives to Minimize Cost & Risk
- Initiatives to Bolster Emissions Abatement
- Initiatives to Address Regulatory Risk & Burdens
- Initiatives to Reform Energy Markets
- Initiatives to Support Energy Infrastructure
State Support for Coal Technologies

Legislative & Regulatory Initiatives

- Regulatory Certainty
- Clean Energy Standards
- R&D Support
- Expediting Coal Project Permitting
- Tax Incentives
- Measured Approach to Coal Plant Retirements

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Recommendations - It’s URGENT!

- **By 2030 -**
  - Retrofit a critical mass of existing coal power plants with carbon capture and efficiency enhancing technologies.
  - More fully demonstrate the viability and maturity of these technologies and their availability through competitive bids from multiple vendors.

- **By 2035 -**
  - Establish a growing network of CO$_2$ storage sites and pipelines approximately five times larger than what exists today.
  - The network will need to expand over time to meet 2050 needs of the power and industrial sectors.

- **By 2040 -**
  - A variety of new coal plant technologies will need to be commercially available, cost competitive and have a near-zero emissions profile.
By 2030 - Retrofit Existing Coal Fleet

- **Enhance Utilization of 45Q Tax Credits** -
  - Extend “under construction” deadline to 2030 (at least)
  - Extend credit period from 12 to 20 years
  - Expedite Class VI permits issued by EPA to states
  - Extend 48A tax credits to existing power plants
  - Complement 45Q with MLP and PAB
  - Secure 100% relief from BEAT for CCUS technology

- **Government Engagement in Risk-Sharing & Incentivizing** -
  - Reforms to DOE Loan Guarantee Program
  - Independent National Development Corporation or Investment Authority

- **New Source Review**
  - GAIN Act
By 2035 -
Establish CO₂ Storage & Pipeline Network

- Include CCUS infrastructure in post-pandemic economic revitalization
- Support R&D and characterization of geologic storage
- Support USE IT Act
- Support INVEST CO₂ Act
By 2040 -
Commercial Deployment of New Technologies

- Federal FEED funding
- Federal funding for demonstration and commercial-scale projects
- Support U.S.-owned companies
- Projects managed by those experienced in large-scale project management
What Will Be Accomplished?

- **By 2030** - Retrofit Existing Coal Fleet
  - Lower the cost of CCUS and advanced coal generation technologies through learning by doing at large-scale demonstration and commercial projects.

- **By 2035** - Establish CO₂ Pipeline & Storage Network
  - Eliminate deployment bottlenecks created by lack of enabling infrastructure

- **By 2040** - New Coal Plant Technologies
  - Enable commercial deployment of a variety of next generation coal plants that are competitive on cost and environmental performance.
Additional Priorities

Coal FIRST
Small Modular Coal Power Plants

Market Reforms
Conclusion

“... we can’t get rid of coal. It is essential to this nation.”

Dan Brouillette, U.S. Secretary of Energy

June 25, 2020 - Penn Live/Patriot News

Janet Gellici, CEO, National Coal Council

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