

DOE STAFF REPORT HIGHLIGHTS NEED TO ADDRESS GRID RELIABILITY & RESILIENCE ISSUES

Just days before his keynote address at the National Coal Council's 2017 Annual Spring Meeting, Energy Secretary Perry tasked his staff with developing a report assessing the reliability and resilience of the electric grid. The "Grid Study," released in late August, reaffirms the value of baseload coal generation in our nation's energy mix.

<https://www.energy.gov/downloads/download-staff-report-secretary-electricity-markets-and-reliability>

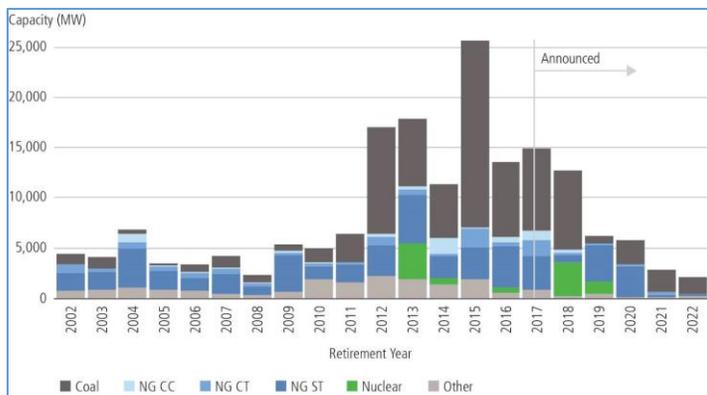


In his cover letter to the report, Secretary Perry notes that "[T]he industry has experienced extraordinary technological and resource changes in recent years ... that are challenging the regulatory paradigm that has guided the industry's growth for decades. The core objective of electricity regulation has always been, and should continue to be, to ensure a reliable and resilient electric supply system that serves customers in an equitable manner."

The Secretary acknowledges the variety of fuel sources available in the U.S. and the need to effectively use these resources to their unique respective advantages, appreciating the variability of each state and region in the nation. "We must utilize the most effective combination of energy sources with an 'all of the above' approach to achieve long-term, reliable American energy security."

DOE's Grid Study explores three issues:

- The evolution of wholesale electricity markets.
- Whether wholesale energy and capacity markets are adequately compensating attributes such as on-site fuel supply and other factors that strengthen grid resilience.
- The extent to which continued regulatory burdens are responsible for forcing the premature retirement of baseload power plants.



National Coal Council reports are referenced in the Study which details historic and prospective power plant retirements, attributes of reliability and resilience, the development of wholesale markets and affordability of generation portfolios. Policy recommendations and areas for further research are also addressed.

[Retirements of Coal, Natural Gas, Nuclear, and Other Generating Units, 2002-2022](#)

Article continues on page 5.

FINAL PROGRAM SET NCC 2017 ANNUAL FALL MEETING SEPTEMBER 26-27 – BIRMINGHAM, AL



The final program is set for the National Coal Council's 2017 Annual Fall Meeting at the Ross Bridge Resort in Birmingham, AL, September 26-27. We're expecting a record attendance for our annual "outside of DC" meeting which includes an optional tour of the National Carbon Capture Center.

Our agenda features Keynote Presentations from **Dr. Grace M. Bochenek, Director, National Energy Technology Lab (NETL)** and **Dan Byers, Senior Director Policy, U.S. Chamber of Commerce Global Energy Institute.**

The Industry Presentations portion of our program features:

Andy Roberts, Wood Mackenzie

Power Sector Evolution Impacts on Coal

Roy W. Hill, Clean Energy Technology Association (CETA)

Technology Innovation: CETA's Lignite Coal Distillation Initiative

Hans Daniels, Doyle Trading Consultants

Global Coal Markets & Opportunities for U.S. Coal Exports

Program and registration details are now available on the NCC website
<http://www.nationalcoalcouncil.org/page-NCC-Events.html>

Program at a Glance

Tuesday, September 26th

- 1:30-2:30 pm Communications Committee Meeting
- 4:30 pm Meeting Registration Opens
- 6:00-7:30 pm Welcoming Reception

Wednesday, September 27th

- 8:30 am-12:15 pm Full Council Meeting
- 12:15-1:15 pm Grab'n'Go Boxed Lunch
- 12:30-4:30 pm Tour of National Carbon Capture Center

Thank You Sponsors!

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Soap Creek Energy & Southern Company

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Arch Coal, Boral Resources, Charah, ClearPath
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Janet Gellici, NCC CEO

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Director Membership & Meetings

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NCC Community News

NCC members are invited to submit news items regarding their companies and organizations to Janet Gellici at info@NCC1.org.



Steve Winberg

Congratulations on DOE Nomination

<https://www.whitehouse.gov/the-press-office/2017/09/02/president-donald-j-trump-announces-intent-nominate-personnel-key>

President Trump has nominated NCC member, Steven E. Winberg to be Assistant Secretary of Energy – Fossil Energy. Best of luck to Steve as he works his way through the nomination confirmation process.

Vicky Sullivan

American Coalition for Clean Coal Electricity

ACCCE White Paper on Coal Fleet Contributions

<http://www.americaspower.org/wp-content/uploads/2017/08/PA-Coal-Fleet-Study.pdf>

ACCCE's latest report on "The Contribution of the Coal Fleet to America's Electricity Grid" – see page 7 for summary.

Glenn Kellow, Peabody Energy

Presentation Highlights Advantages of Baseload Coal

[Advantage of Baseload Coal Generation](#)

Peabody Energy's President & CEO addressed the American Coal Council in August on the advantages of baseload coal generation – see page 7 for a summary of his remarks.

Kathy Walker, Elm Street Resources

Appointed to Uranium Company Board

[Ur-Energy Board Appointment Announcement](#)

Ur-Energy announced the appointment of Kathy Walker to its Board of Directors. Ur-Energy is a uranium mining company operating the Lost Creek in-situ recovery uranium facility in Wyoming.

Fred Palmer, Heartland Institute

Heartland Hosting America First Energy Conference

<https://www.heartland.org/events/events/america-first-energy-conference>

Heartland's America First Energy Conference will be hosted November 9, 2017 in Houston, Texas.

NCC ASSOCIATES NEWS

Wyoming Integrated Test Center

TEDx Presentation on Depoliticizing Carbon

<https://www.youtube.com/watch?v=7cMaTK3PnL4>

Jason Bigger, Executive Director of the Wyoming Infrastructure Authority, the agency charged with overseeing construction of the Wyoming Integrated Test Center, addressed the question of "How Rural, West America is Depoliticizing Carbon" in his TEDx presentation.

COAL RESOURCES & NEWS

U.S. Department of Energy

www.energy.gov

[Office of Fossil Energy](#)

National Energy

[Technology Laboratory](#)

www.netl.doe.gov

[Coal & Power Systems](#)

Nation's oldest coal-fired steamboat returns to Mystic River - [Fox News](#)

Montana coal mine production up 2 million tons
[Billings Gazette](#)

City Pledges for '100% Renewable Energy' are 99% Misleading
[Wall Street Journal - Chuck McConnell](#)

Inside the Effort to Fight Climate Change Beyond the Power Sector - [TIME](#)

Can Marijuana Rescue Coal Country?
[Washington Post Magazine](#)

Bipartisanship? It's happening to secure America's energy future - [The Hill](#)

Justice says coal plan a matter of national security
[MetroNews](#)

Under Trump, Coal Mining Gets New Life on U.S. Lands
[New York Times](#)

Switching from coal to natural gas will not save our planet
[Seattle Times](#)

America's Other Coal Job, Ignored by Politicians, Is Dying Fast
[Bloomberg](#)

National Coal Council
NationalCoalCouncil.org

NCC Member Focus

Scott Teel is an actively engaged member of the NCC's Executive Committee and Chair's Leadership Council. At Scott's invitation, we'll be hosting our 2017 Fall Annual Meeting in Birmingham and touring the Southern Company-supported National Carbon Capture Center. Thanks for your outstanding support, Scott!

Scott Teel is vice president of commercial operations for Southern Company, located in Birmingham, Alabama.

Scott joined commercial operations in 2015, with responsibility for the management of the coal and natural gas procurement programs. Since then, he has assumed additional responsibilities, including fleet operations, assuring generation is online and dispatched to serve the Company's real time demand, power trading, and the financial settlement of power, gas and coal transactions.

Prior to these roles, Scott served as chief financial officer for Gulf Power, Southern Company's electric utility based in Pensacola, Florida. At Gulf, he was responsible for financial planning and budgeting, pricing and forecasting, as well as accounting.

Scott joined Southern Company in 1999, with responsibility for natural gas trading and operations and progressed to roles of increasing responsibility across the power generation and financial organizations in Birmingham, Atlanta and Pensacola. Before joining Southern Company, he held positions at Sonat and Ernst & Young.

Scott earned a bachelor's degree in accounting from the University of Alabama in 1992. He is married to Melody and has two teenage sons, Ben and Charlie.



SCOTT TEEL
VICE PRESIDENT
OF COMMERCIAL OPERATIONS
SOUTHERN COMPANY

Southern Company is based in Atlanta and serves over 9 million electric and natural gas customers through its subsidiaries. The company has over 46,000 MW of generating capacity, primarily in the Southeast but has been expanding rapidly across America in recent years.

Southern Company is committed to maintaining and developing the full portfolio of energy resources, with its current energy mix comprised of approximately 30% coal generation. The company is also an industry leader in research and development.

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DOE GRID STUDY

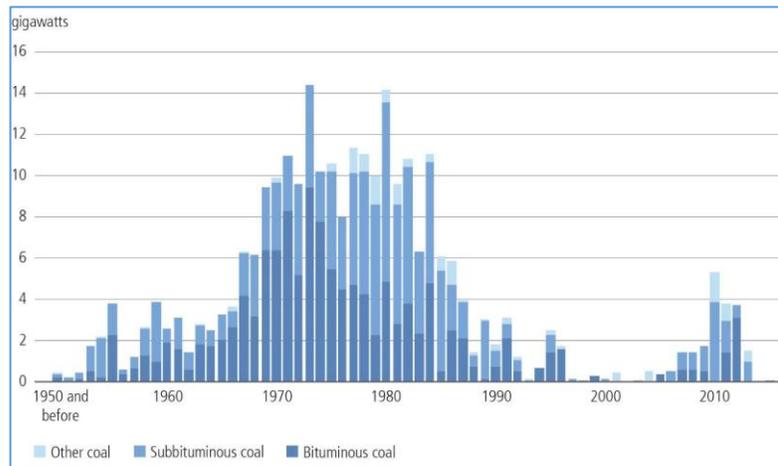
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Among the key findings from the Grid Study:

The evolution of wholesale electricity markets.

- Low average wholesale energy prices, while beneficial for buyers of wholesale electricity, represent a critical juncture for many existing baseload generation resources and their role in preserving reliability and resilience.
- Market designs may be inadequate given potential future challenges.
- Markets need further study and reform to address future services essential to grid reliability.
- Americans value the various benefits specific power plants offer, such as jobs, community economic development, local tax payments, low emissions and energy security. Many of these benefits are not recognized or compensated by wholesale markets.



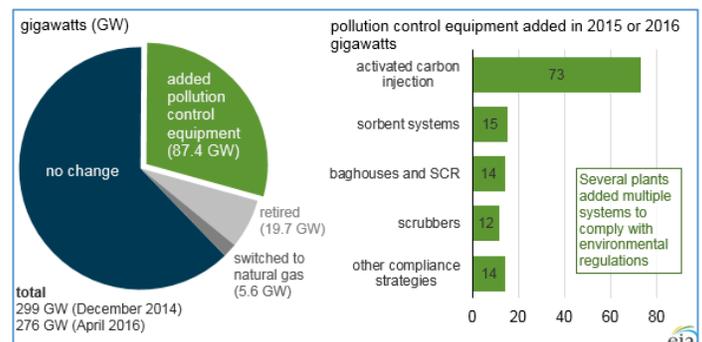
Utility-Scale Coal-Fired Electric Generating Capacity Additions by Coal Type & Initial Operating Year

Are wholesale energy and capacity markets adequately compensating attributes such as on-site fuel supply and other factors that strengthen grid resilience.

- Markets recognize and compensate reliability, but more work is needed to address resilience.
- Fuel assurance is a growing consideration for the electricity system. Maintaining onsite fuel resources is one way to improve fuel assurance.
- A resilient grid needs to be designed to handle high-impact, low probability events.

The extent to which continued regulatory burdens are responsible for forcing the premature retirement of baseload power plants.

- Various factors have contributed to the retirement of power plants, including low-cost natural gas and low growth in electricity demand.
- The dispatch of variable renewable energy, accelerated by government policies and mandates, has negatively impacted the economics of baseload plants (coal and nuclear).
- Investments required for regulatory compliance have also negatively impacted baseload plant economics.
- The continued closure of traditional baseload power plants calls for a comprehensive strategy for long-term reliability and resilience.



Changes in U.S. Coal Capacity, December 2014-April 2016



NCC ACTIVITIES & NEWS

NCC Representatives Meet with Shenhua Delegation



A delegation of 18 representatives from China's Shenhua Group visited Washington, DC in early September to meet with industry and government officials. The delegation included staff with expertise in power plant management, boilers, environmental controls, fly ash, shale reservoirs, coal economics, power market policies, business planning and training programs. The Shenhua Group Corporation is a multinational energy company engaged in power generation, railway and port transportation, shipping, coal-to-liquids and coal chemicals. It is the largest coal supplier and power generation company in the world employing over 200,000 staff.

<http://www.shenhua.cc/shenhuaEn/index.shtml>

NCC CEO **Janet Gellici** delivered a brief overview of the National Coal Council, along with other associations including the U.S. Energy Association, Gasification & Syngas Technology Council and **Carbon Utilization Research Council**. NCC members in attendance included **Holly Krutka** (Peabody Energy), **Clark Harrison** (Purestream) and **Daman Walia** (ARCTECH, Inc.). The delegation's visit to Washington, DC and other U.S. cities was organized by NCC member **Dick Bajura** (West Virginia University).

Of related interest are the following news items regarding China's coal supply and power sectors:

- China Set to Create World's Top Utility with Latest Government Merger
[Reuters August 28, 2017](#)
- China Ramps Up Coal Exports, Creating U.S. Natural Gas Opportunity
[Forbes August 8, 2017](#)
- Profits for Chinese Coal Producers Soar
[UPI August 7, 2017](#)
- How China is on the Leading Edge of Environmental Technologies
[Power Magazine July 2017](#)

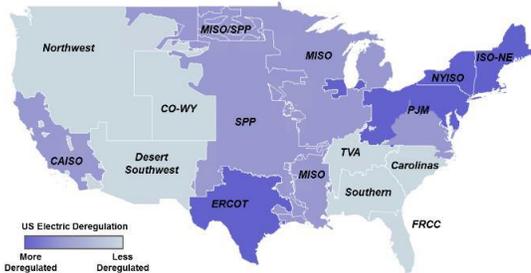
THANK YOU! NCC CHAIR'S LEADERSHIP COUNCIL MEMBERS



Two Papers Address Value of U.S. Existing Coal Fleet



AMERICAN COALITION FOR CLEAN COAL ELECTRICITY



In late August, the **American Coalition for Clean Coal Electricity (ACCCE)** published a report entitled “The Contribution of the Coal Fleet to America’s Electricity Grid.” The report provided a comparative analysis among various fuel resources in terms of their ability to deliver attributes that contribute to the U.S. power systems’ reliability and resiliency.

The report also addressed the lack of uniformity across various regions in the U.S. in terms of market structure and generation supply. Over half of U.S. states have adapted some form of electric deregulation while the remainder continue to operate under some form of regulation. In some regions, there has been rapid integration of new renewable technologies; other regions have limited renewable resources. Solutions that work for one part of the country may not work for another.

ACCCE’s report highlights the benefits that existing coal generation provides to both the current and future electricity system. Among the report’s conclusions:

- Coal generation provides many attributes that are critical for grid reliability and resilience.
- Resource diversity is critical in maintaining a reliable and resilient electricity system.
- The coal fleet provides stable pricing as a hedge against natural gas price volatility.

Attribute	Coal	Natural Gas	Wind/Solar	Nuclear	Demand Response
Dispatchability	✓	✓		✓	
Inertia	✓	✓	✓(wind)	✓	
Frequency Response	✓	✓	✓		
Contingency Reserves	✓	✓			✓
Reactive Power	✓	✓		✓	
Ramp Capability	✓	✓			✓
Black Start		✓			
Resource Availability	✓	✓		✓	
On-Site Fuel Supply	✓			✓	✓
Reduced Exposure to Single Point of Disruption	✓	✓	✓	✓	✓
Price Stability	✓		✓	✓	✓

<http://www.americaspower.org/wp-content/uploads/2017/08/PA-Coal-Fleet-Study.pdf>



Many of these same points were addressed by Peabody Energy’s President CEO **Glenn Kellow** in a recent presentation to the **American Coal Council (ACC)**. He noted that electricity systems are complex organisms striving to

accomplish the three dimensional goals of energy reliability, economic growth and environmental protection. In working toward a more balanced energy under the new Administration, Kellow acknowledged Secretary Perry’s recognition that reducing coal from the baseload mix and forcing reliance on renewables creates vulnerabilities that could put the country at risk.

Kellow proposes a path forward that includes leveling the playing field between baseload and renewable energy; creating a diverse portfolio standard at the state level; continuing to make coal generation more competitive throughout the entire coal value chain (production-transportation-consumption); and advancing high-efficiency, low-emissions (HELE) technologies.



https://www.peabodyenergy.com/Peabody/media/MediaLibrary/Media%20Center/2017-ACC-Presentation-Digital_FINAL.pdf

News Worthy from the Department of Energy

\$50 Million for Large-Scale Pilot Fossil Fuel Projects



On August 24th, the Department of Energy (DOE) announced the availability of a \$50 million funding opportunity through the Office of Fossil Energy to design, construct and operate two large-scale pilots for transformational coal technologies that improve coal-powered systems' performance, efficiency, emission reduction and cost of electricity.

Details on the funding opportunity can be accessed at:

<https://www.grants.gov/web/grants/search-grants.html?keywords=DE-FOA-0001788>

\$17.4 Million to Advance Recovery of Rare Earth Elements

On August 16th, DOE announced the selection of four projects to move on to a second phase of research in their efforts to advance recovery of rare earth elements (REE) from coal and coal byproducts. DOE will invest \$17.4 million to develop and test REE recovery systems originally selected and designed under Phase 1 of a prior funding opportunity through the Agency's Office of Fossil Energy.

Among the projects selected:

- **University of North Dakota's Institute for Energy Studies** – using lignite coal as feedstock to test REE recovery.
- **West Virginia University's Research Corporation** – using acid mine drainage solids as feedstock for recovery of REEs.
- **Physical Sciences, Inc.** – using coal fly ash as a feedstock for processing REE.
- **University of Kentucky Research Foundation** – using two sources of coal preparation byproducts as feedstock for REE recovery.

Details at: <https://www.energy.gov/articles/doe-invests-174-million-projects-advance-recovery-rare-earth-elements-coal-and-coal>

News Worthy from the Administration & Congress

Trump's Energy Agenda is Plowing Ahead

<https://www.cnbc.com/2017/08/02/trumps-energy-agenda-is-plowing-ahead-as-other-initiatives-stall.html>

CNBC reported on various energy initiatives under President Trump's Administration that have been advanced, including:

- Approving Dakota Access Pipeline
- Approving Keystone XL Pipeline
- Made-in-America requirement for pipelines
- Repealing the Stream Protection Rule
- Storing nuclear waste at Yucca Mountain
- Revoking the Clean Power Plant
- Rewriting rules to stop methane leaks from oil and gas industry
- Ending Obama's temporary ban on federal coal leasing
- Expanding offshore drilling



Infographics of Note

Check out the new infographic at DOE on Rare Earth Elements from coal at <https://www.energy.gov/fe/downloads/infographic-rare-earth-elements-coal>. And the infographic from a recent report from EEI, AAPA and NRECA on “Powering America: The Economic and Workforce Contributions of the U.S. Electric Power Industry.” <http://mjbradley.com/sites/default/files/PoweringAmerica.pdf>

RARE EARTH ELEMENTS FROM COAL?

RARE EARTH ELEMENTS (REEs)
Elements of interest are found in the "rare earth" group of 17 elements on the periodic table. These elements are used in transportation, health care, renewable products, and national defense technologies, as well as in the consumer electronics and computer hardware and software of daily life.

DEMAND FOR REEs IS VERY HIGH
Demand continues to grow. But, they're not common. They're hard to mine, and it takes a long time to bring them down and expedite to market. That's why the United States depends heavily on imports for needed REEs. Currently, China is the leading provider of REEs, and it has over 90 percent of the world's supply.

THE NEED TO IMPORT REEs MAY CHANGE
Domestic coal reserves in natural resource rich areas. The U.S. Department of Energy's Office of Fossil Fuels is focusing on developing technologies that can help recover REEs from coal and other fossil fuels. Mining is possible to recover REEs in areas that's ecologically and economically feasible.

RECOVERABLE COAL RESERVES
Current U.S. REE reserves are estimated at 1.4 million tons, and the coal bed in the U.S. could produce an additional 11 million tons of REEs.

DEVELOPING REEs IN THE UNITED STATES MEANS MORE JOBS
A 2014 Resource Characterization Report estimates the REEs used in production and technology support industries that generate \$329 billion of economic output and employ more than 630,000 workers in the U.S. America.

DEVELOPING A SUSTAINABLE, DOMESTIC REE SUPPLY
Produced and used by precious metals in the United States (Independent Coal Country)—attracting advanced manufacturing facilities and jobs to these areas.

From improving everyday technologies, to securing our energy independence, to creating jobs—there are plenty of advantages to developing an REE supply from U.S. coal and coal by-products. And the U.S. Department of Energy is working to make that happen.

U.S. DEPARTMENT OF ENERGY | coal2energy

Powering America

THE U.S. ELECTRIC POWER INDUSTRY CREATES AMERICAN JOBS AND SUPPORTS A HEALTHY ECONOMY

The electric power industry **SUPPORTS**

7 MILLION+ AMERICAN JOBS

2,662,000 DIRECTLY PROVIDED | 4,418,000 INDUCED*

491,000 ELECTRIC POWER INDUSTRY EMPLOYEES	756,000 CONTRACTORS & SUPPLY CHAIN	1,415,000 INVESTMENT INDUCED BY POWER INDUSTRY EMPLOYEES	678,000 INDUCED BY POWER INDUSTRY EMPLOYEES	959,000 INDUCED BY CONTRACTORS & SUPPLY CHAIN	445,000 INDUCED BY PUBLIC SECTOR	2,336,000 ECONOMY-WIDE RIPPLE EFFECT
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*Induced jobs are spread throughout the economy and include many positions that are the result of paycheck spending by workers and government spending to support the communities around those workers. (As an example, induced jobs can range from elementary school teachers to medical doctors to real estate professionals, not to mention the many jobs in the service economy.)

MILITARY VETERAN HIRING comprised **10%+** OF NEW HIRES as of year-end 2014

GOOD WAGES
2x THE NATIONAL MEDIAN
2015 median ANNUAL WAGES in the electric power industry were **\$73,000**

INVESTS \$100 BILLION+ PER YEAR to build a smarter, cleaner, and more resilient **ENERGY INFRASTRUCTURE**

CONTRIBUTES \$880 BILLION to U.S. GDP
5% OF TOTAL GDP

Source: Powering America: The Economic and Workforce Contributions of the U.S. Electric Power Industry, M.J. Bradley & Associates (MJB&A), August 2017.

MJB & A | EEI | AMERICAN PUBLIC POWER ASSOCIATION | NRECA

VIEW THE ENTIRE REPORT

WHO KNEW?*



Clean Energy Conversions Laboratory - Colorado School of Mines

<http://cec-lab.mines.edu/>

The Clean Energy Conversions Laboratory at the Colorado School of Mines (CSM) is focused on trace metal (mercury, arsenic and selenium) and carbon dioxide capture and sequestration (CCUS) processes.

Central to the lab's approach is to connect with government labs and establish industry partnerships to assist in focusing and directing CEC's research efforts in a way that bridges atomistic scales to power-plant scales.



CEC's CCUS research efforts include investigation of adsorption and membrane processes for carbon capture applications. Breakthrough and isotherm experiments are carried out on carbon-based sorbents to investigate the kinetics and material capacities.

Simulations using Grand Canonical Monte Carlo are carried out to assist in sorbent design (pore structure and chemistry). Similar models are used to investigate gas (CO₂, methane, water) transport in nanoporous systems of coal and gas shale rocks. Nitrogen-selective membrane technology is also investigated for carbon capture.

NCC member, **Dr. Jennifer Wilcox**, Associate Professor in Chemical and Biological Engineering at CSM, is an Investigator with the Clean Energy Conversions Lab. She was recently featured in a "People Behind the Science" Podcast

<http://www.peoplebehindthescience.com/dr-jennifer-wilcox/>



***A regularly featured column on industry, university and government initiatives in support of advanced coal technology development and commercialization.**