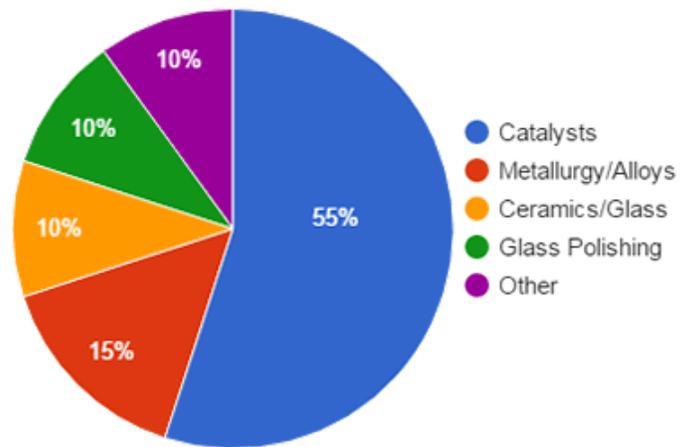


RARE EARTH ELEMENTS A NEW OPPORTUNITY FOR COAL?

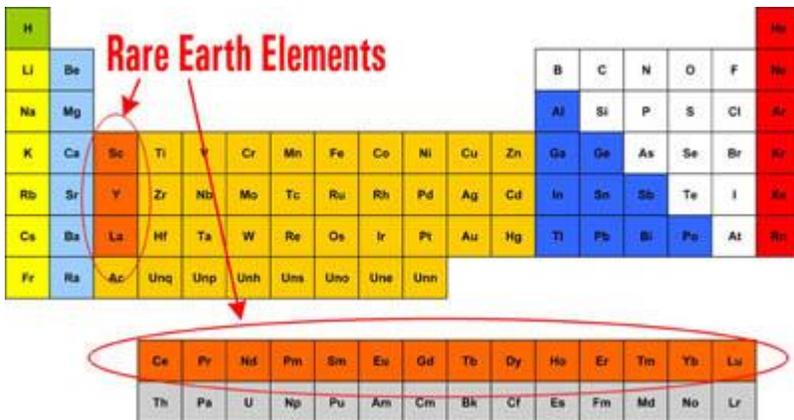
A number of recent remarks by Administration officials and news articles have called attention to rare earth elements (REE) and potential opportunities to extract REEs from coal and coal by-products. In June 2017, the U.S. Department of Energy announced that it's investing \$6.9 million in REE research through two funding opportunities (see page 5 for details).

According to the Rare Earth Technology Alliance (www.rareearthtechalliance.com), rare earths are a series of chemical elements found in the Earth's crust that are vital to many modern technologies, including consumer electronics, computers and networks, communications, clean energy, advanced transportation, health care, environmental mitigation, national defense and many other applications. REEs' unique properties help make many technologies perform with reduced weight, emissions and energy consumption, or enhance their efficiency, performance, miniaturization, speed, durability and thermal stability.

Uses of Rare Earth Elements



Uses in the United States as reported by the United States Geological Survey Mineral Commodity Summary, 2017



There are 17 elements that are considered to be rare earth elements – the majority of which the U.S. is currently importing, principally from China. For example, in 2016, the U.S. imported 100% of its Scandium (Sc(21)) from China to produce TVs and energy-saving lamps and to strengthen metal compounds. That same year, we also imported 100% of the Yttrium (Y (39)) we needed from China, Estonia, Japan and Germany, to produce superconductors, pulsed lasers, cancer treatment drugs, rheumatoid arthritis

medicines and surgical supplies. The U.S. is 100% net import reliant for other REEs from China, Estonia, France and Japan (see graphic page 5).

America's vast coal resources contain quantities of REEs that offer the potential to reduce our import dependence on other nations for these critical elements, as well as the opportunity to create new industries in regions where coal has played an important economic role.

Article continues on page 5.

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



**NCC's 2017 Annual Fall Meeting will be hosted at the
Ross Bridge Resort in Birmingham, Alabama.**

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

NCC is pleased to confirm the following speakers for its 2017 Annual Fall Meeting on September 27th:

Dr. Anthony Ku, Director
National Institute of Clean and Low-Carbon Energy (NICE)
"China's Efforts to Advance HELE Coal Plants & Coal Conversion Facilities"

Andy Roberts, Research Director – Global Thermal Coal Markets
Wood Mackenzie
"What's Needed to Incentivize Development of Advanced Coal Plants?"

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

MEETING REGISTRATION IS NOW OPEN!
DEADLINES: HOTEL RESERVATIONS – AUGUST 22nd
MEETING REGISTRATION – SEPTEMBER 15th

NCC LEADERSHIP

Greg Workman, NCC Chair

Director Fuels
Dominion Resources

Deck Stone,
NCC Vice Chair (Acting)
Coal Policy Chair

Sr. VP Strategy & Public Policy
Arch Coal

Bill Brownell, Esquire
Vice Chair Coal Policy
Chair, Hunton & Williams

Dan Roling, Finance Chair
CEO, NOVADX Ventures Corp.

Lisa J.N. Bradley, PhD, DABT
Communications Chair
Vice President/Sr Toxicologist
Haley & Aldrich

Executive Committee Members

Shannon Banaga, Dir Fed Affairs
TECO Energy

George Duggan, VP Coal
BNSF Railway

Shelia Glesmann
SVP Enviro & External Affairs
ADA Carbon Solutions

Danny Gray
EVP Govt & Enviro Affairs
Charah LLC.

John Kennedy, VP & Gen Mgr
Dynegy

Todd Savage, EVP Group Leader
Savage Companies

Mike Sorensen, Sr. Mgr. Fuel
Tri-State G&T

Scott Teel, VP Fuel Services
Southern Company

Kemal Williamson
President Americas
Peabody Energy

Ex Officio

Joe Craft, III, President
Alliance Coal

Mike Durham, Principal
Soap Creek Energy

John Eaves, President & CEO
Arch Coal

Joe Hopf
Jeff Wallace, Director
CNX Coal Resources

NCC Staff/Support

Janet Gellici, NCC CEO

Hiranthie Stanford
Director Membership & Meetings

Fred Eames/Julia d'Hemecourt
NCC Legal Counsel

Hunton & Williams

NationalCoalCouncil.org

1101 Pennsylvania Ave. NW, #300
Washington, DC 20004
(202) 756-4524



NCC Community News

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

Mike Holmes

Lignite Energy Council

North Dakota Coal Resource for Rare Earth Elements

[North Dakota Studying Coal as a Supply of Valuable Rare Earth Elements](#)

The Lignite Energy Council is helping fund a study of North Dakota coal as a resource for rare earth elements.

Bill Brownell

Hunton & Williams

H&W Wins 2017 Chambers USA Award for Excellence

<https://www.huntonnickelreportblog.com/2017/06/hunton-williams-wins-2017-chambers-usa-award-for-excellence-for-environment/>

Hunton & Williams' environmental team was recognized as the team of the year in the environmental practice area at the 2017 Chambers USA Awards. Congrats to all the smart folks at H&W!

Clark Harrison

New Position at Purestream Services LLC

<http://www.purestreaminc.com>

Congratulations to Clark Harrison on his new position as Director of Business Development at Purestream Services LLC.

Holly Krutka

Peabody Energy

Congratulations to Holly Krutka on the birth of her twin daughters!

Greg Workman

Dominion Energy

<https://www.whitehouse.gov/the-press-office/2017/06/29/remarks-president-trump-unleashing-american-energy-event>

Greg Workman was invited by the U.S. Department of Energy to participate in the "Unleashing American Energy" event on June 29th which featured remarks by President Donald Trump.

NCC ASSOCIATES NEWS

Institute for 21st Century Energy

New Name: Global Energy Institute

www.energyxxi.org



The U.S. Chamber of Commerce's Institute for 21st Century Energy, celebrating its 10-year anniversary, will henceforth be known as the Global Energy Institute.

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](#)

Town That Helped Power Northwest Feels Left Behind In Shift Away From Coal

[NPR](#)

Could carbon capturing make 'clean coal' a reality?

[PBS NewsHour](#)

Why This Part of Coal Country Loves Solar Power

[Politico](#)

Trump Has China to Thank for Recent Coal Industry Spike

[TIME](#)

Coal on the rise in China, U.S. and India after major 2016 drop

[USA Today](#)

Death of coal has been greatly exaggerated

[Columbus Dispatch](#)

The outlook has improved for Wyoming's energy industries – but there's hope for an even better future

[Casper Tribune](#)

Coal Production in West Virginia: 2017-2040

[West Virginia University](#)

Clean-coal cheaper option than renewables

[The Australian](#)

National Coal Council

NationalCoalCouncil.org

NCC Member Focus

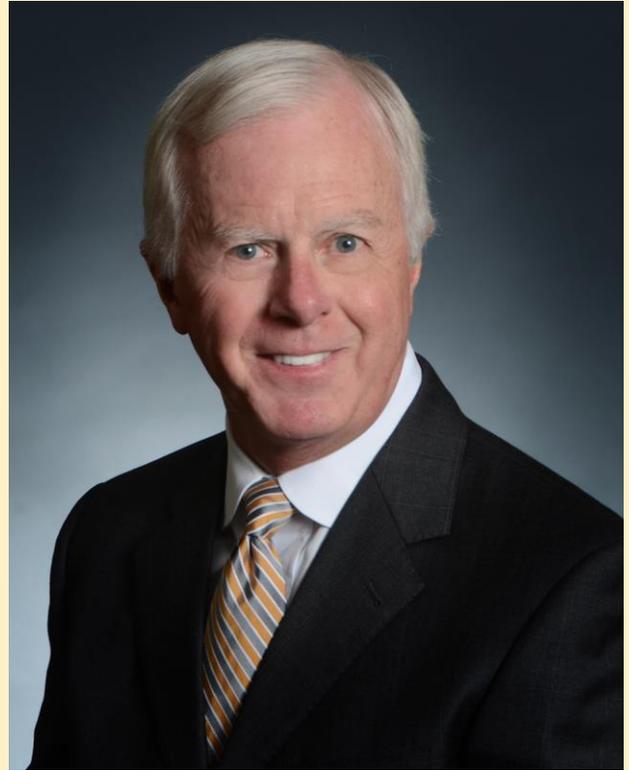
David Flannery was appointed to the NCC in 2015. Dave has participated in a number of NCC studies lending his legal expertise on environmental issues. Thank you for your service, Dave!

David M. Flannery began his legal practice in 1972 after graduating from West Virginia University with degrees in Electrical Engineering and Law. Throughout more than 40 years of practice, Dave has become a sought after resource for companies faced with energy, environmental, and regulatory issues.

Dave joined Steptoe & Johnson PLLC in 2013. He advises clients in multiple states on compliance with state and federal environmental regulations and has even helped craft legislation governing hazardous waste, groundwater and air pollution. He has been a member of the West Virginia Carbon Capture and Sequestration Working Group which made recommendations to the West Virginia Legislature on how sequestration programs could be established in the state.

Dave is a Founding Regent of the American College of Environmental Lawyers. He is a member and past chair of the Board of Directors and member and past chair of the Environmental Committee of the West Virginia Chamber of Commerce. He is a member of the Section on Natural Resources and Environmental Law of the American Bar Association and is a trustee for the Energy and Mineral Law Foundation.

By appointment of the Governor of West Virginia, Dave serves as a Commissioner of the Ohio River Valley Water Sanitation Commission. He is peer-review rated AV by Martindale-Hubbell and is included among The Best Lawyers in America®. He is ranked in Chambers USA, America's Leading Lawyers for Business in the Natural Resources: Environmental Law category.



DAVID M. FLANNERY
MEMBER
STEPTOE & JOHNSON PLLC

Steptoe & Johnson PLLC is a U.S. law firm with core strengths in energy, labor and employment, litigation and transactional law. In 2013, Steptoe & Johnson celebrated 100 years of helping clients reach their goals.

Steptoe & Johnson's Environmental and Regulatory attorneys represent clients before federal, state and local courts and administrative boards in civil, criminal and administration matters.

David Flannery
Steptoe & Johnson PPLC
Chase Tower, 8th Floor
707 Virginia St. East
Charleston WV 25301
(304) 353-8171

dave.flannery@steptoe-johnson.com

Rare Earth Elements (continued from page 1)

NETL'S REE Program

<https://www.netl.doe.gov/research/coal/rare-earth-elements>

With roots dating back to 2009, DOE's National Energy Technology Lab (NETL) REE Program is focused on developing technologies for the recovery of REEs from coal and coal-by products. The program offers a pathway to improve the economics and reduce the environmental impact of a domestic coal-based REE value chain.

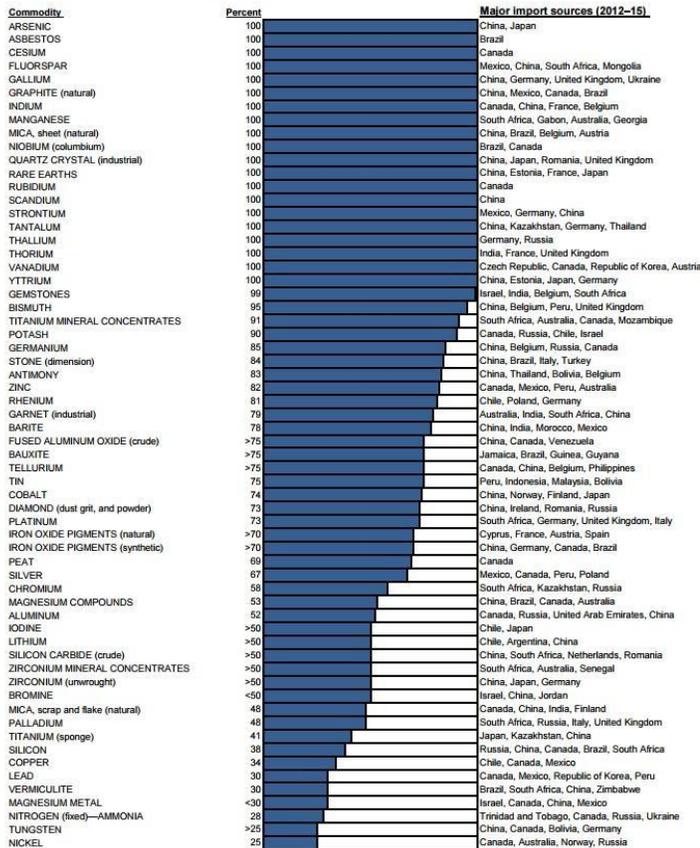
NETL's Program consists of five core technology areas, including 1) Resource Sampling & Characterization, 2) Separation Technology Development, 3) REE Sensor Development, 4) Process & Systems Modeling, and 5) Techno-economic Analysis.

In a January 2017 report to Congress, DOE noted that greater than 90% of the world's REE production capacity is controlled by China. The expanding need for REEs is driving demand for a reliable and affordable domestic supply of REEs. The report notes that the "key to unlocking [this] potential reserve base for economic U.S. REE production from coal and coal byproducts is the improvement of separation technologies ... continued laboratory work, as well as separations technology development, [are needed] to improve the economics of REE production."

<https://edx.netl.doe.gov/ree/>

Among NCC member entities currently working with NETL on R&D initiatives: Battelle, University of Kentucky, University of North Dakota, University of Wyoming, and West Virginia University.

2016 U.S. NET IMPORT RELIANCE



Resources

At NCC's 2016 Annual Fall Meeting in Milwaukee, Danny Gray with Charah, LLC delivered a presentation on traditional and future market opportunities for the use of Coal Combustion Residuals (CCRs or coal ash), including the extraction of REEs. He noted the need for access to reserves for both historic and future applications of CCRs and for policies and regulations to provide a pathway to access.

<http://www.nationalcoalcouncil.org/studies/2016/Gray-Charah-Coal-Ash-and-Rare-Earth-Elements.pdf>

The June 2017 announcement of \$6.9 of funding opportunities through DOE, include the awarding of \$3 million to 3 research projects aimed at producing salable REEs from domestic coal and coal by-products. An additional \$3.95 million is being made available for projects to accelerate separation and extraction processes for REE.

<https://www.netl.doe.gov/newsroom/news-releases/news-details?id=7c769fc9-050e-467d-8e2c-fdf6413f712e>

A report on NETL's portfolio of projects is available at

<https://www.netl.doe.gov/File%20Library/Research/Coal/Rare%20Earth%20Elements/REE-Project-Portfolio-2016.pdf>



NCC ACTIVITIES & NEWS

NCC Annual Fall Meeting Tour Option National Carbon Capture Center

<https://www.nationalcarboncapturecenter.com/>

Immediately following the conclusion of the NCC's Annual Fall Meeting, NCC members and guests will have the opportunity to tour the National Carbon Capture Center (NCCC). The NCCC is a world-class test facility with highly specialized staff whose work is focused on accelerating the commercialization of advanced technologies to enable fossil fuel-based power plants to achieve near-zero emissions.

Those interested in touring the facility on September 27th, 12:30-4:30 pm should register at:

<http://www.nationalcoalcouncil.org/page-NCC-Events.html>



NCC in the News



"Coal Industry Could be in Store for 'Rare Earth' Reboot"
Washington Examiner – June 12, 2017

<http://www.washingtonexaminer.com/coal-industry-could-be-in-store-for-a-rare-earth-reboot/article/2625275>

"Analysts Say Coal Industry Primed for Mining Material Used in Solar Panels"
The Daily Caller – June 12, 2017

<http://dailycaller.com/2017/06/12/analysts-say-coal-industry-primed-for-mining-material-used-in-solar-panels/>

NCC Upcoming Speaking Engagements

Upcoming presentations by NCC CEO Janet Gellici

- ~ **The Coal Institute** – July 2017, Myrtle Beach, South Carolina
- ~ **Carbon Management Technology Conference** – July 2017, Houston



Electricity Market Design



On April 17th, 2017, Energy Secretary Perry ordered a DOE departmental review of the electricity grid aimed at assessing whether federal policies have hurt the electric grid's supply of baseload power or the reliability of electricity supply generated by coal and nuclear baseload power plants. The study is due to be released in July.

https://s3.amazonaws.com/dive_static/paychek/energy_memo.pdf

In advance of DOE's study release, a multi-state group co-convened by Wyoming Governor Matt Mead and Montana

Governor Steve Bullock released a new report in late June outlining opportunities and challenges for integrating power plants with carbon capture into the nation's wholesale electricity markets. The State CO₂-EOR Deployment Work Group is working to expand carbon capture from power plants and industrial facilities for use in enhanced oil recovery.

<http://www.betterenergy.org/publications/electricity-market-design-and-carbon-capture-technology>

The report – Electricity Market Design and Carbon Capture Technology: The Opportunities and Challenges – focuses on the role of carbon capture in the power sector and outlines measures needed at the federal, state and regional grid operator level to allow for robust integration and dispatch of carbon capture in electricity markets. State and federal policy makers have only recently begun to consider policies to ensure the continued viability of dispatchable generation resources in evolving electricity markets.

NCC member **Brad Crabtree** with the **Great Plains Institute** noted that “At the federal level, financial incentives, Federal Energy Regulatory Commission initiatives, and expanded research, development, demonstration and deployment were identified as measures to help carbon capture and other low and zero-carbon dispatchable energy resources participate cost-effectively in electricity markets.”

At the regional level, the report calls for changes to regional grid operators' market rules that value both grid capacity and emissions reductions which would better recognize the many benefits of all dispatchable low and zero-carbon resources. For their part, states could consider expanding existing renewable portfolio standards policies to include energy from low and zero-carbon non-renewable generation sources and explore the potential for developing separate low-carbon generation standards or credits.

THANK YOU! NCC CHAIR'S LEADERSHIP COUNCIL MEMBERS



News Worthy from the Department of Energy

Secretary Perry Testifies on DOE FY2018 Budget



Energy Secretary Rick Perry had a busy week in June, spending three consecutive days on the Hill addressing questions regarding the Department of Energy's FY2018 budget.

On June 20th, the Secretary testified before the Energy and Water Subcommittee of the House Committee on Appropriations, noting that he wished "I had been confirmed by the Senate earlier so I could be a full participant in crafting this [budget] proposal." In his written testimony, the

Secretary notes that the President's FY 2018 \$28 billion budget request for DOE advances its key missions, focusing on priorities while reigning in spending. He acknowledges that "This budget proposal makes some difficult choices."

<https://appropriations.house.gov/calendar/eventsingle.aspx?EventID=394910>

Secretary Perry presented similar testimony on June 21st, before the Subcommittee on Energy and Water Development of the Senate Committee on Appropriations. Of note regarding coal technology related R&D, the Secretary noted that "The Budget refocuses the Department's energy and science programs on early-stage research and development at our national laboratories to advance American primacy in scientific and energy research in an efficient and cost-effective manner. The Budget funds \$6.4 billion in early-state R&D while reducing later-stage research, development, demonstration, and deployment programs by \$3.1 billion from the FY 2017 Enacted levels.

<https://www.appropriations.senate.gov/hearings/review-of-the-fy2018-budget-request-for-the-us-department-of-energy>



Finally, on June 22nd Secretary Perry testified before the Senate Committee on Energy and Natural Resources. The Secretary reiterated that the FY 2018 Budget focuses its investments on "basic, early-stage R&D" providing \$4.5 billion for the Office of Science and \$1.9 billion for energy R&D programs, "with a renewed focus on cutting-edge innovation and transitioning those breakthroughs to the private marketplace." He further noted that the budget consolidates programs focused on bringing technologies to the market in the Office of Technology Transitions.

<https://energy.gov/technologytransitions/office-technology-transitions>

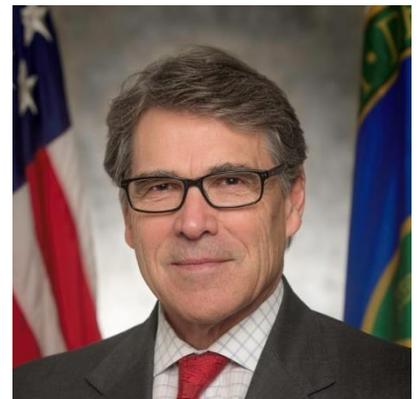
The FY 2018 Budget provides \$280 million for cutting-edge fossil energy R&D, including innovative clean coal technologies. \$30 million is budgeted for "a new initiative to repower coal-fired plants through research on advanced technologies and systems that improve the reliability and efficiency of existing coal units and incorporates new, advanced technology components and systems."

The Secretary also highlighted the intent to support research on "coal combustion to help support potential U.S. coal exports" as well as "research on carbon utilization efforts to develop materials and chemicals for new business opportunities."

<https://www.energy.senate.gov/public/index.cfm/hearings-and-business-meetings?ID=3D7A436C-2A99-4639-980B-A356CEEB8850>

In related news, it was reported that during his various Congressional testimonies, Secretary Perry suggested that shortfalls in funding for energy research could be made up through efforts undertaken by the private sector.

<https://morningconsult.com/2017/06/22/perry-seeks-private-sector-solutions-energy-research/>



More News Worthy from the Department of Energy



EIA Energy Conference Addresses Current & Future Energy Challenges

<https://www.eia.gov/conference/2017/?src=home-f2>

The Department of Energy’s Energy Information Administration (EIA) hosted its annual Energy Conference in Washington, DC, June 26-27. The one session devoted to coal was focused on “Coal-Natural Gas Competition” and featured presentations by:

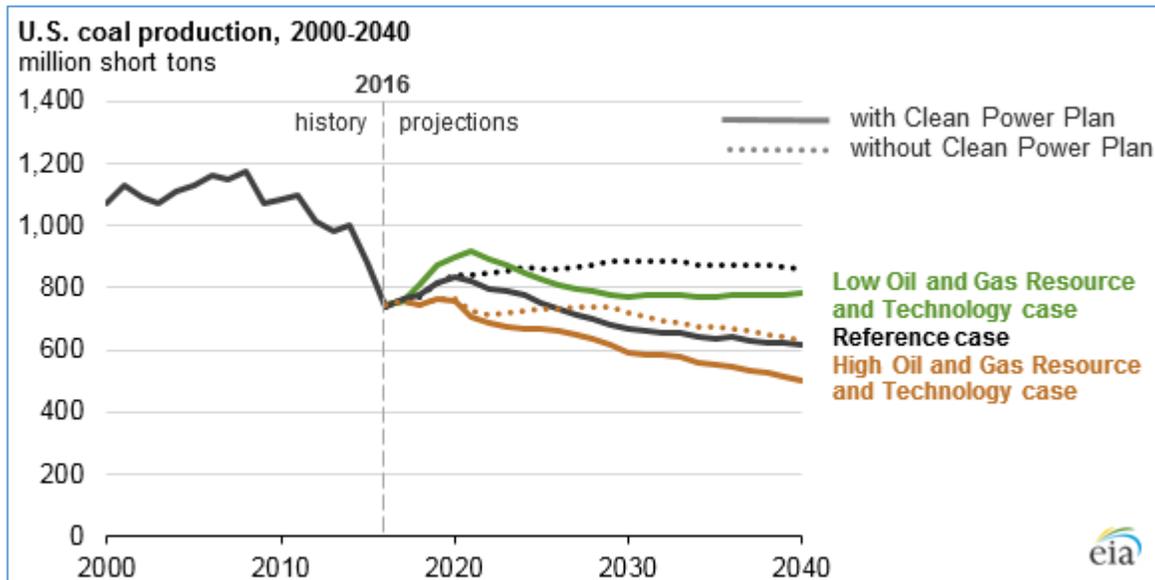
Robin Bedillion, EPRI
 “Technology Considerations for Coal-to-Natural Gas Conversions”
https://www.eia.gov/conference/2017/pdf/presentations/robin_bedellin.pdf

Robert DiDonna, Energy Ventures Analysis
 “Coal-Natural Gas Competition: The Current State of Play – Impact on System Dispatch”
https://www.eia.gov/conference/2017/pdf/presentations/rob_didona.pdf

Jamie Heller, Hellerworx, Inc.
 “Coal-Natural Gas Competition: Coal and Rail Industry Impacts”
https://www.eia.gov/conference/2017/pdf/presentations/jamie_heller.pdf

Future Coal Production Depends on Resources & Technology

<https://www.eia.gov/todayinenergy/detail.php?id=31792>



EIA projects that trends in coal production in the U.S. could range from flat to continuing declines through 2040. According to EIA, electric power generation accounts for more than 92% of U.S. coal demand, and domestic coal production has declined significantly over the past decade due to displacement by natural gas and renewable energy.

News Worthy from the Administration & Congress

The Path to U.S. Energy Dominance

The week of June 26th was designated “Energy Week” in Washington, DC with numerous events and announcements from the Administration related to energy.



The highlight of the week was an event hosted at the Department of Energy, which was attended by **NCC Chair, Greg Workman** (Dominion Energy). The “Unleashing American Energy” event featured a panel on American Energy Dominance featuring Energy Secretary Rick Perry, EPA Administrator Scott Pruitt and Interior Secretary Ryan Zinke. Their remarks are best summarized in an OpEd piece published in the Washington Times, “Paving the path to U.S. energy dominance.” The authors assert that “An energy-dominant America will export to markets around the world, increasing our global leadership and influence. Becoming

energy dominant means that we are getting government out of the way so that we can share our energy wealth with developing nations.” They also commented on the role of the U.S. in advancing clean energy, noting that the nation already leads the world in lowering emissions and citing the Petra Nova facility in Texas that removes 90% of CO₂ after coal combustion generation and uses that captured CO₂ for enhanced oil recovery. Perry, Pruitt and Zinke emphasized pursuit of an “all of the above” energy portfolio “to allow the United States to achieve energy independence, dramatically reduce our trade deficits, and create jobs beyond the 6.4 million Americans currently employed in the sector.”

<http://www.washingtontimes.com/news/2017/jun/26/us-energy-dominance-is-achievable/>

The “Unleashing American Energy” event also featured brief remarks by President Trump announcing six new initiatives to propel a new era of American energy dominance. The initiative related to coal called on the Department of the Treasury to address barriers to “the financing of highly efficient, overseas coal energy plants.” The President cited demand for U.S. coal in the Ukraine as an example of an opportunity to enhance exports of U.S. coal.

<https://www.whitehouse.gov/the-press-office/2017/06/29/remarks-president-trump-unleashing-american-energy-event>



WHO KNEW?*

Scottish Carbon Capture & Storage

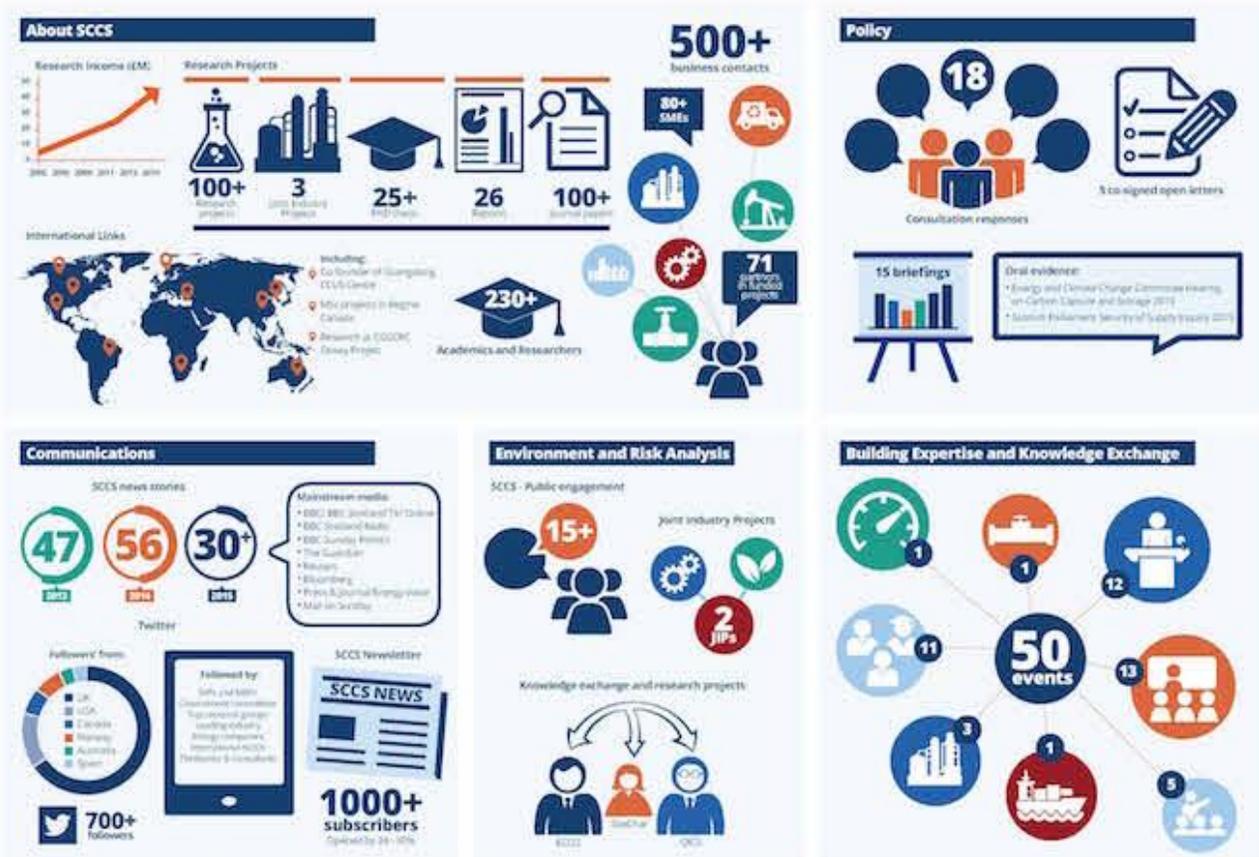
<http://www.sccs.org.uk/>



Scottish Carbon Capture & Storage (SCCS) is the largest carbon capture and storage (CCS) research group in the UK, staffed by internationally renowned researchers. SCCS serves as a conduit between academia, industry and government, providing a single point of coordination for all aspects of CCS research ranging from capture engineering and geoscience, to social perceptions and environmental impact, through to law and petroleum economics.

SCCS has access to cutting-edge experimental and analytical facilities, expertise in field studies, modelling and simulation, key academic research personnel to accelerate the development of CO₂ transportation, capture and subsurface storage. The group undertakes strategic fundamental research, as well as providing consultancy services.

Founded in 2005, SCCS is a partnership of the British Geological Survey, Heriot-Watt University, the University of Aberdeen, the University of Edinburgh and the University of Strathclyde, working together with universities across Scotland. SCCS is funded by the Scottish Funding Council.



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