

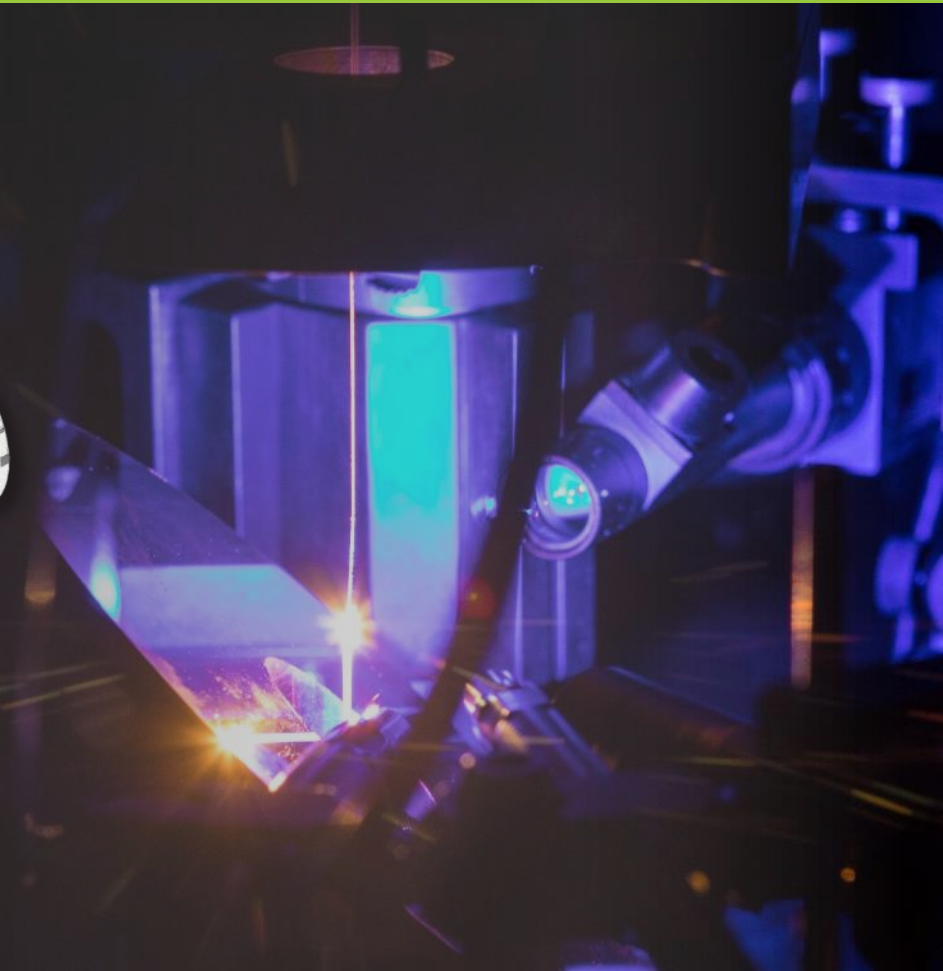
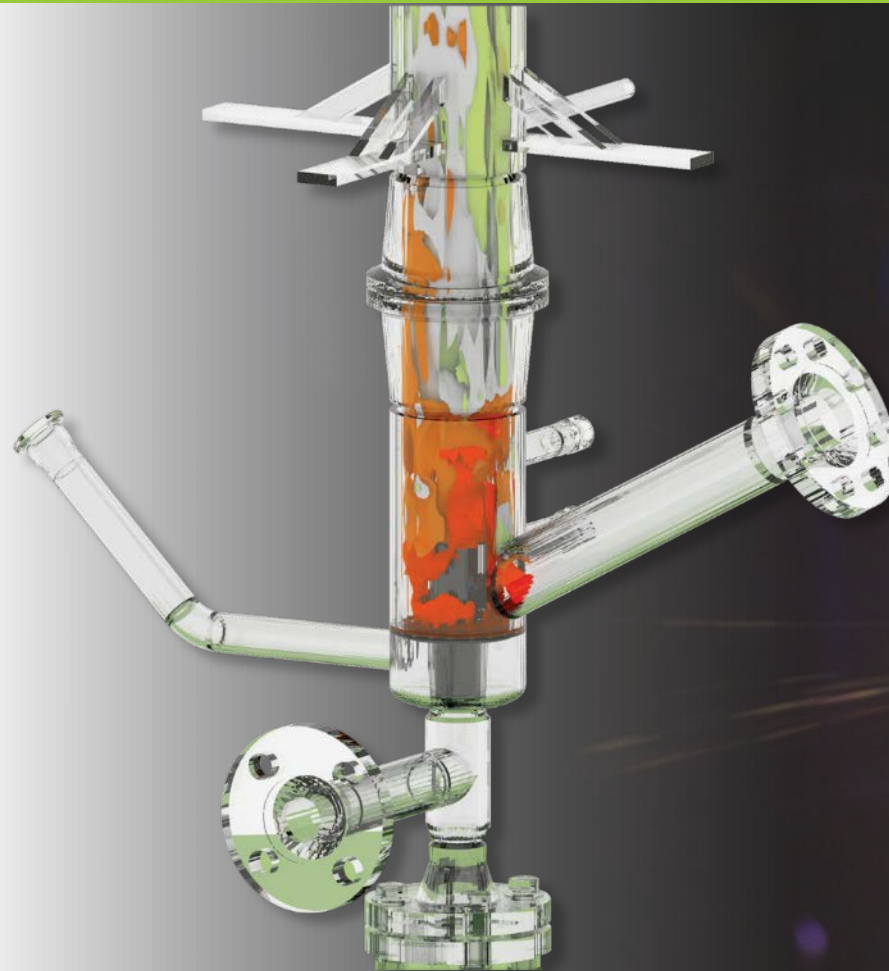
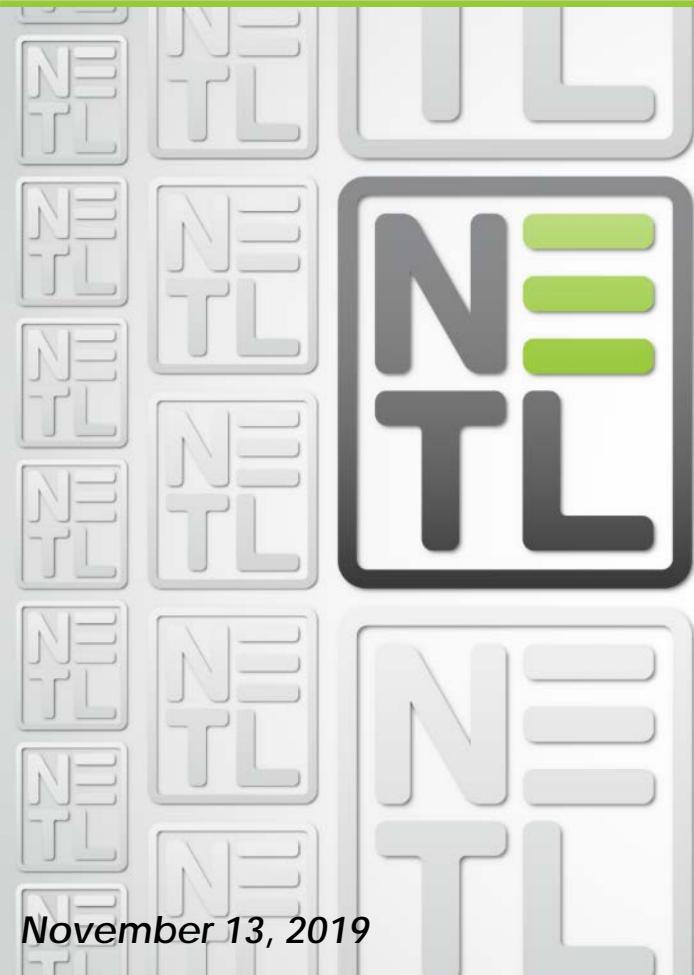
Crosscutting Research



NETL Webinar on FE's Minority Serving Institutions Program

Sydni Credle, Ph.D., P.E.

Technology Manager, University Training and Research



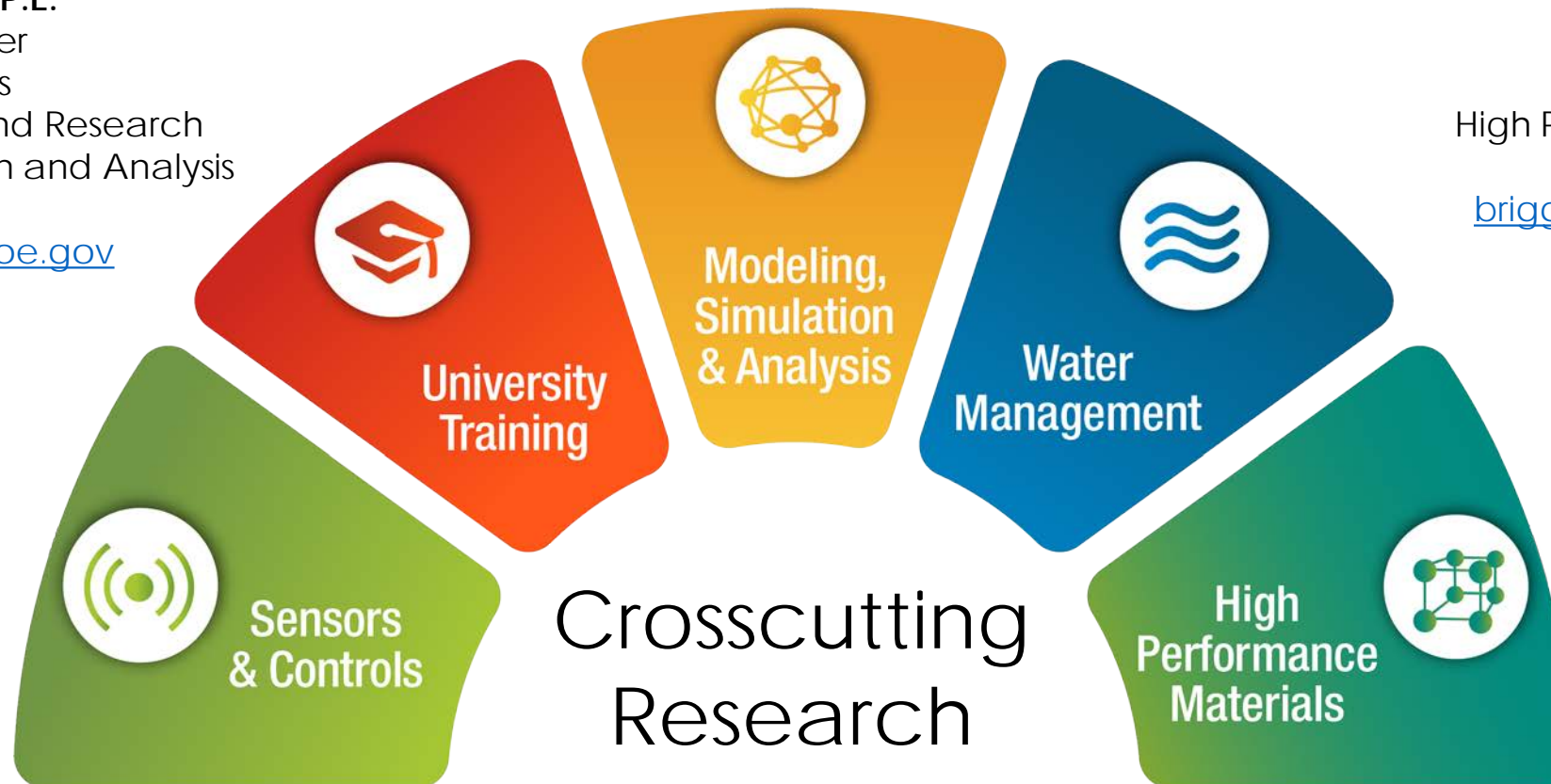
November 13, 2019

Crosscutting Research Program Areas

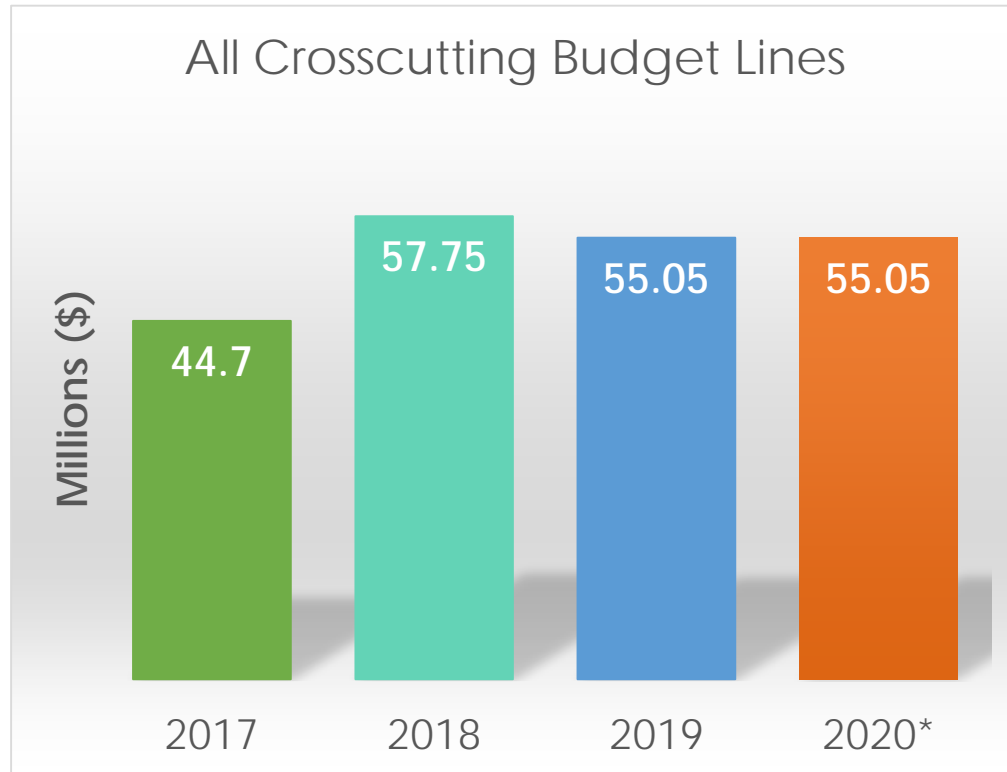
Broad Applicability, Multiplier Impact

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Budget



Budget Lines	FY17	FY18	FY19	FY20*
Sensors & Controls	\$3.65M	\$7.5M	\$8M	\$8M
Modeling	\$20.85M	\$20M	\$14M	\$14M
Water Management	\$9.8M	\$7M	\$8M	\$8M
Materials	\$8M	\$20M	\$20M	\$20M
HBCU	\$1M	\$1M	\$2.05M	\$2.05M
UCR	\$1.4M	\$2.25M	\$3M	\$3M
Total	\$44.7M	\$57.75M	55.05M	55.05M

*Continuing Resolution

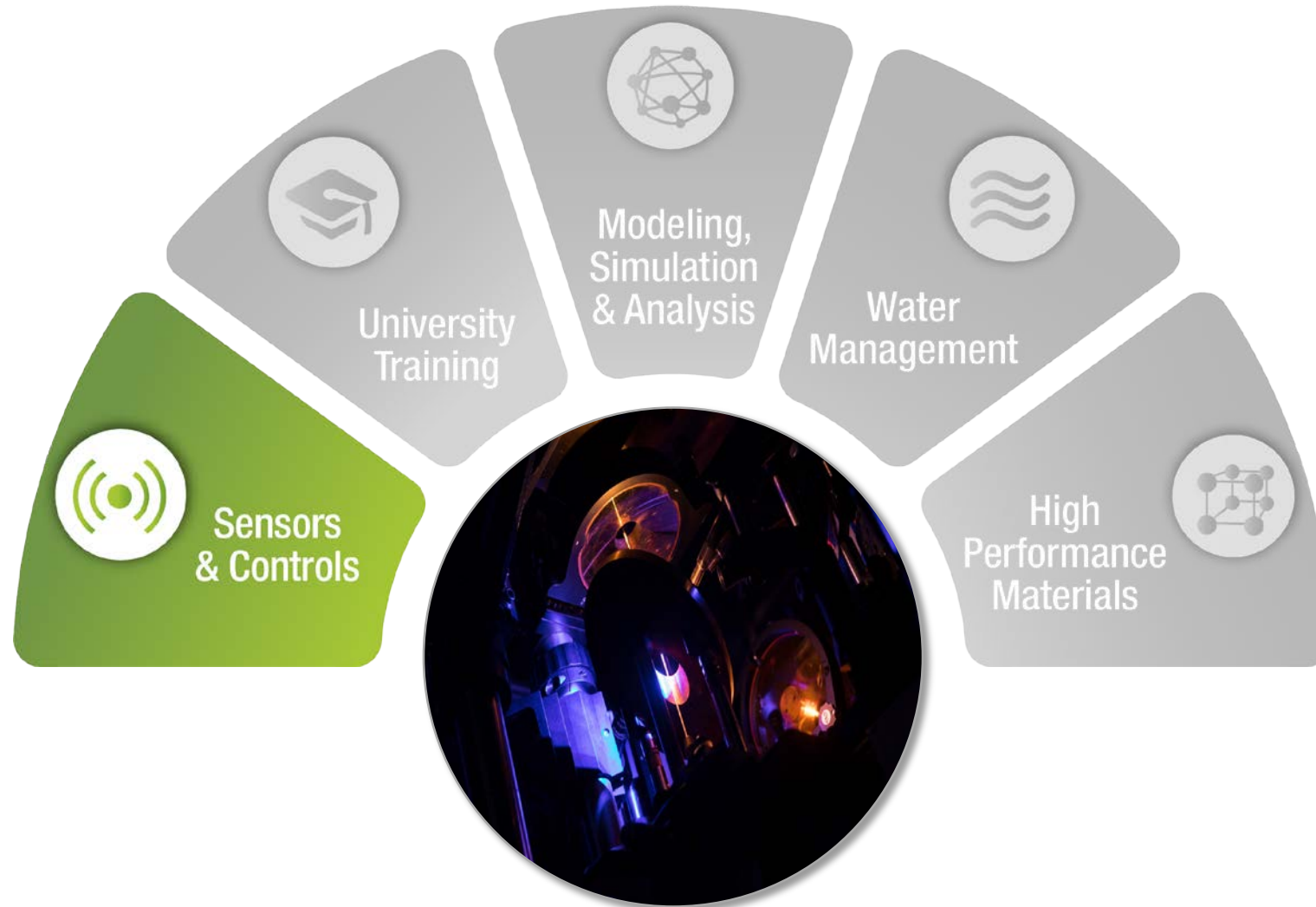
New FOA Awards in FY19



29 new Crosscutting Research projects received \$24 million in federal funding

Topic	FOA	Details
Advanced Materials for High-Efficiency, Flexible and Reliable Coal-Fueled Power Plants	DE-FOA-0002002	5 projects DOE Funding: \$4,469,403
Advanced Manufacturing of Embedded Sensors	DE-FOA-0002001	3 projects DOE Funding: \$2,999,002
Coal Power Plant Cooling Technology - Cooling Tower Enhancement	DE-FOA-0002001	3 projects DOE Funding: \$3,385,718
Modeling Existing Coal Plant Challenges	DE-FOA-0002001	4 projects DOE Funding: \$2,909,485
Application of Novel Analytic Method(s) to Determine Arsenic and/or Selenium Concentrations in Fly Ash Waste Streams Generated from Coal Combustion	DE-FOA-0001991	2 projects DOE Funding: \$799,706
Coal Plant Effluent Water Reuse	DE-FOA-0001991	1 project DOE Funding: \$400,000
Cybersecure Sensors for Fossil Power Generation	DE-FOA-0001991	4 projects DOE Funding: \$1,600,000
Modeling Existing Coal Plant Challenges using High Performance Computing	DE-FOA-0001991	3 projects DOE Funding: \$1,199,238
Adaptive Data-Driven Approaches featuring Physics-Based Attributes for Improved Flexibility, Reliability, and Performance	DE-FOA-0001989	3 projects DOE Funding: \$4,286,228
Artificial Intelligence for Enhanced Data Analytics and Control of Coal-based Power Plants	DE-FOA-0001989	1 projects DOE Funding: \$1,999,837

Program Areas



<https://netl.doe.gov/coal/sensors-and-controls>

Real-Time Monitoring and Diagnostics



Condition-Based Maintenance



Distributed Intelligent Controls



Cyber Security



Mission: Test and mature novel sensor and control systems operable in coal-fired power plants for real-time measurement capability, improved overall plant efficiencies, more effective ramp rates, and increased flexibility.

Program Areas



<https://netl.doe.gov/coal/university-training>

- **Historically Black Colleges & Universities and Other Minority Institutions (HBCU/OMI)**
 - Provide and promote opportunities for HBCU/OMI in science and engineering.
 - Foster private sector participation and interaction with HBCU/OMI in fossil energy related programs.
 - Provide a forum to facilitate technology transfer, strengthen educational training, and develop/enhance the research infrastructure capabilities of HBCU/OMI.
- **University Coal Research (UCR)**
 - Sustain a national university program of fossil energy research that focuses on innovative and fundamental investigations pertinent to fossil fuel conversion and utilization
 - Support development of future scientists and engineers through exposure to research in fossil energy technologies
 - Improve our fundamental scientific and technical understanding of chemical and physical processes involved in the conversion and utilization of fossil fuels

University Training and Research

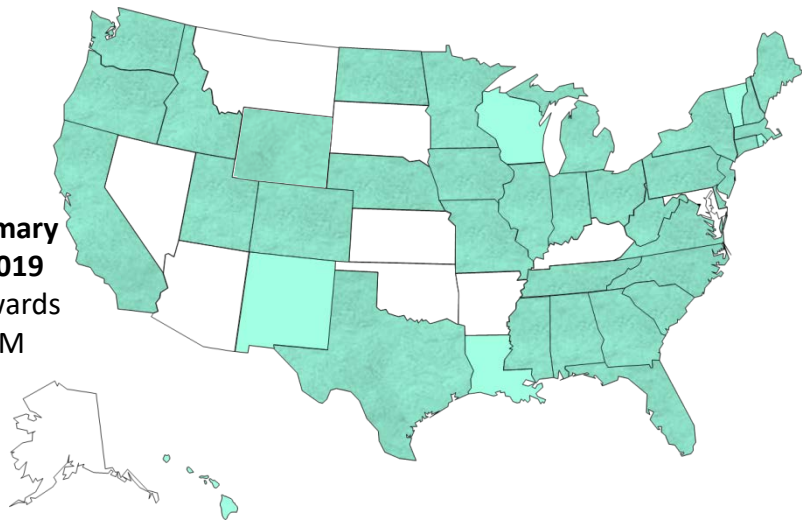
Workforce & Talent Development

\$32.3M and 101 grants
3,000 student researchers
Fossil Energy research
STEM training addresses workforce gap

\$500,000 per award
No cost share requirement

UCR Summary 2010 – 2019

- 66 Awards
- \$23.1M



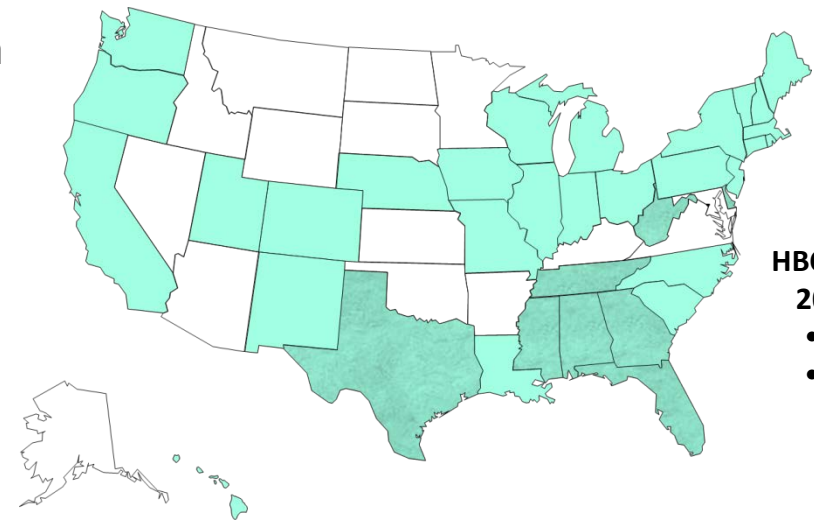
Since Program Inception Through 2018

UCR Program Results:

- 1000+ Technical Papers
- 10+ Technical Awards
- 7 Patents Issued to Date

HBCU Program Results:

- 500+ Technical Papers
- 5+ Technical Awards
- 2 Patents Issued to Date



HBCU Summary 2010 – 2019

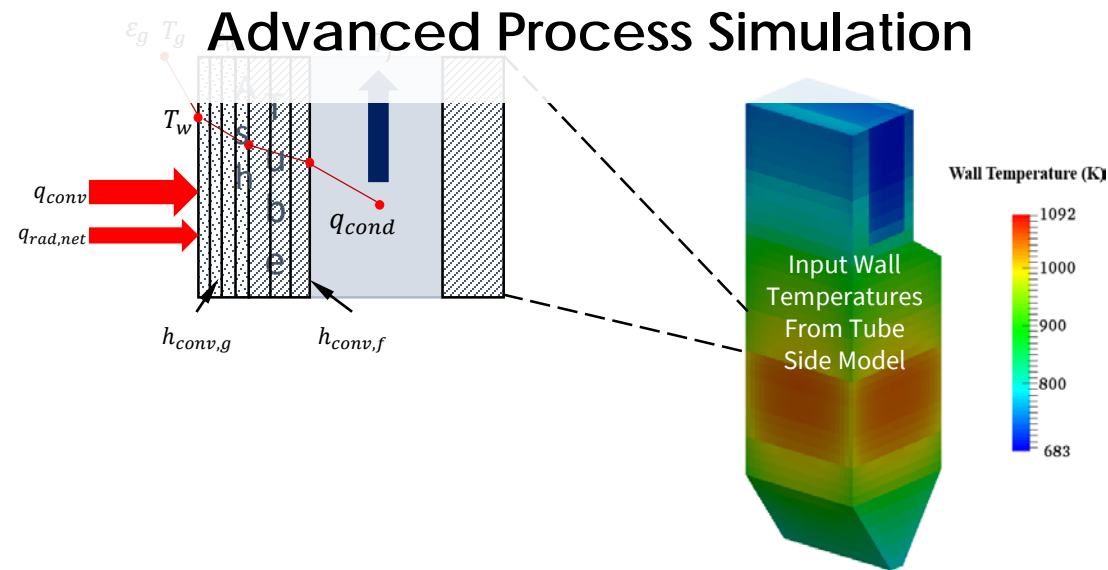
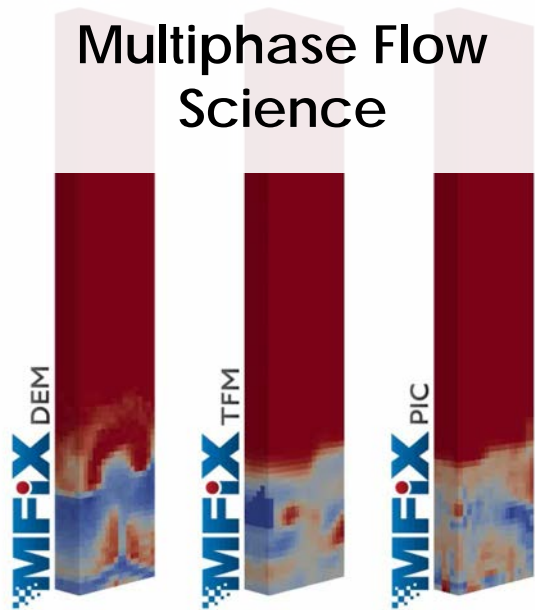
- 35 Awards
- \$9.2M

Program Areas



<https://netl.doe.gov/coal/modeling-simulation-analysis>

Mission: Simulate coal fleet challenges to lift-up technology solutions, apply computational tools at multiple scales to accelerate development and deployment.



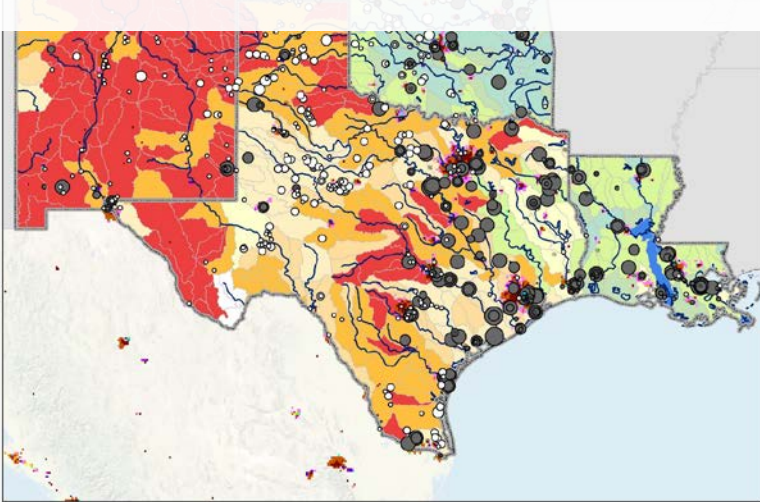
Program Areas



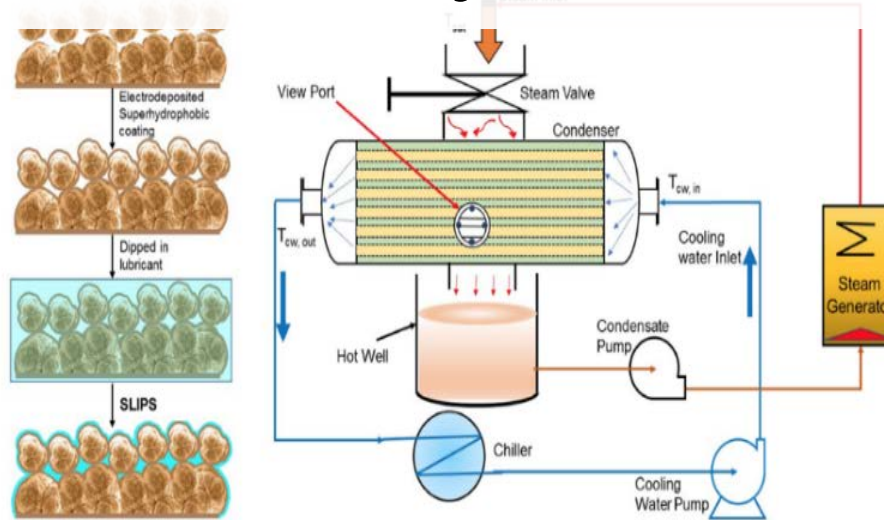
<https://netl.doe.gov/coal/water-management>

Mission: Provide leadership, raise awareness, and offer cost-effective technical solutions to potential national issues in water quality and availability.

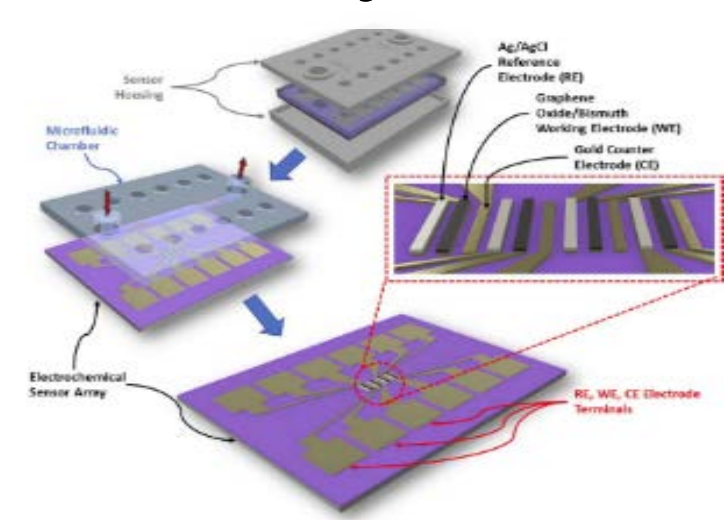
Energy Water Analysis



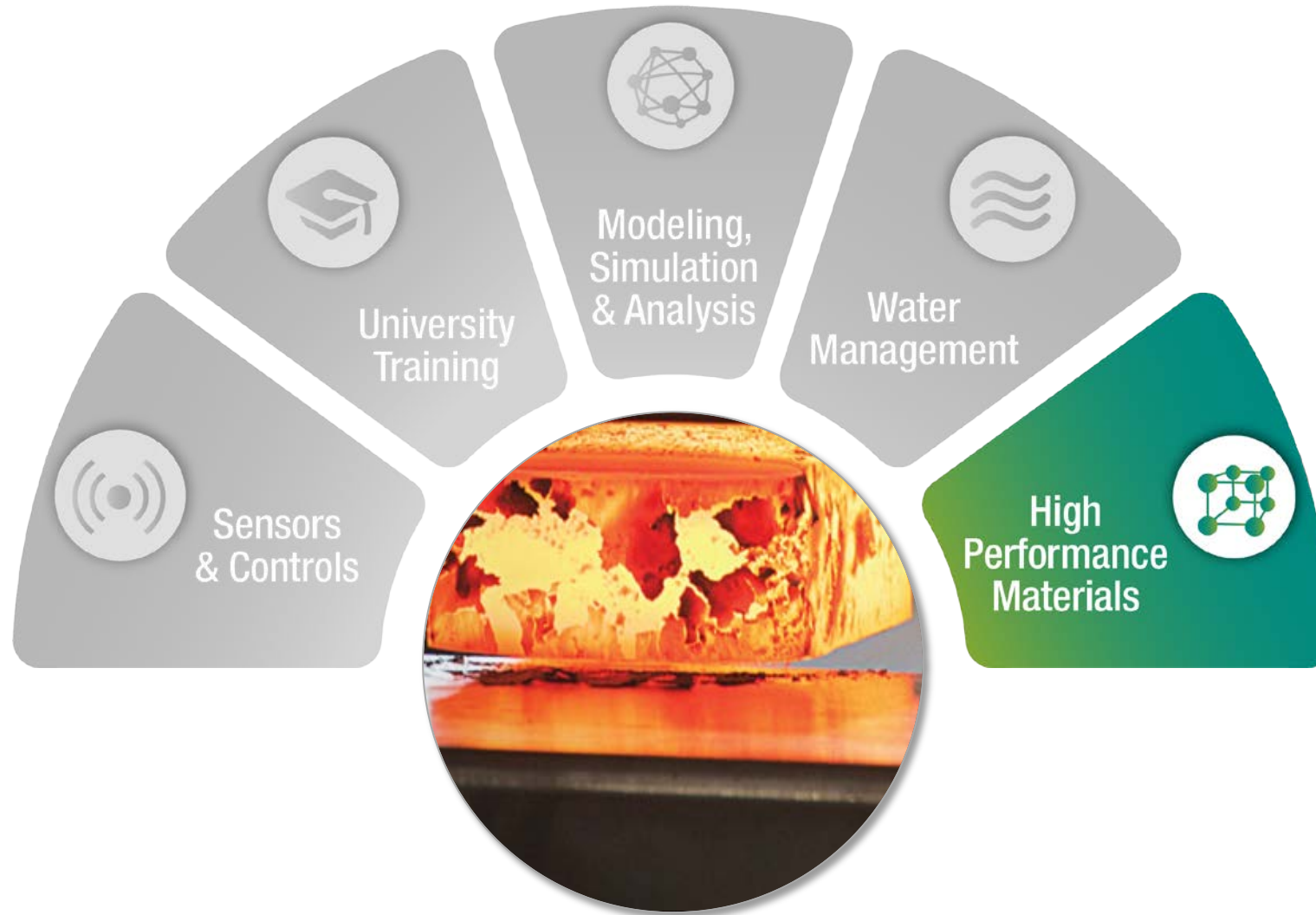
Water Efficiency and Reuse



Flexibility & Cost



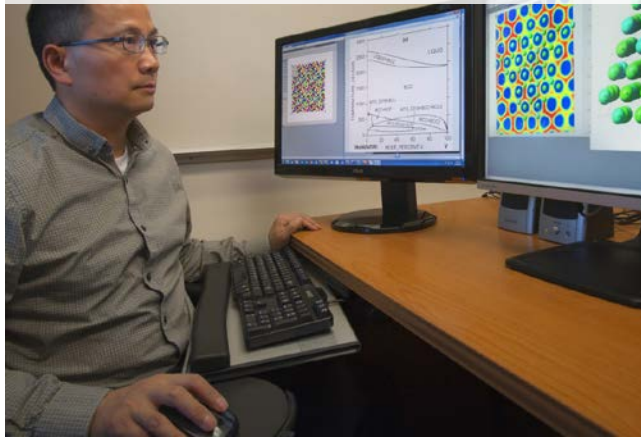
Program Areas



<https://netl.doe.gov/coal/high-performance-materials>

Mission: Characterize, produce, and certify cost-effective alloys and high performance materials suitable for extreme environments found in coal power generation to support existing and new plants.

Computational
Materials Design



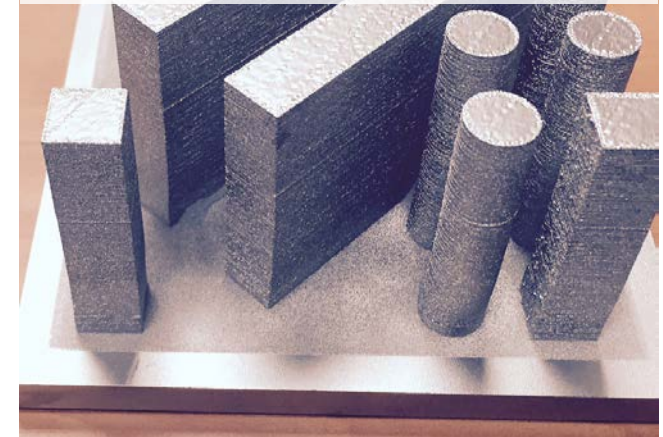
Advanced
Structural
Materials



Functional Materials
for Process
Performance



Advanced
Manufacturing



Annual Crosscutting Project Review Meeting

April 21-23, 2020

Omni-William Penn Hotel, Pittsburgh PA

Links to Proceedings of Previous Project Review Meetings

[2019](#)

[2016](#)

[2018](#)

[2015](#)

[2017](#)

[2014](#)



Useful Links

NETL

- www.netl.doe.gov

Office of Fossil Energy

- www.energy.gov/fe

Crosscutting Research

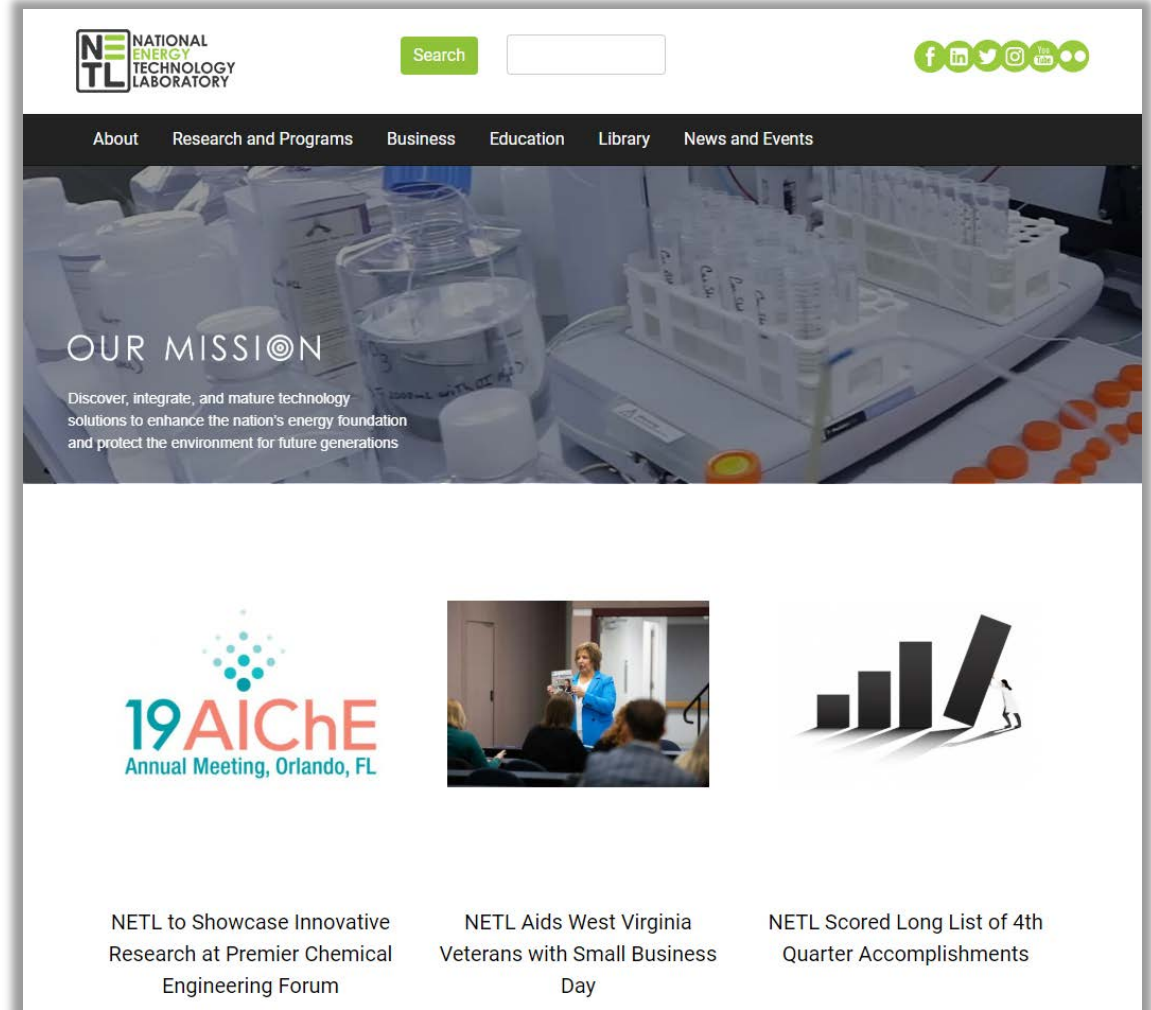
- www.netl.doe.gov/research/coal/crosscutting

Project Information

- <https://www.netl.doe.gov/node/2476>

Project Portfolios/Publications

- <https://netl.doe.gov/crosscutting/publications>



The screenshot shows the NETL website homepage. At the top left is the NETL logo. To its right is a search bar with a green 'Search' button. Further right are social media icons for Facebook, LinkedIn, Twitter, Instagram, YouTube, and a generic profile icon. Below the header is a navigation menu with links for 'About', 'Research and Programs', 'Business', 'Education', 'Library', and 'News and Events'. The main content area features a large image of laboratory equipment with the text 'OUR MISSION' and a description: 'Discover, integrate, and mature technology solutions to enhance the nation's energy foundation and protect the environment for future generations.' Below this are three featured news items, each with a logo, a small image, and a title: 1. '19AIChE Annual Meeting, Orlando, FL' with a logo of blue dots and a photo of a woman presenting. 2. 'NETL Aids West Virginia Veterans with Small Business Day' with a photo of a woman in a blue jacket. 3. 'NETL Scored Long List of 4th Quarter Accomplishments' with a bar chart icon.

Questions?

VISIT US AT: www.NETL.DOE.gov



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@NationalEnergyTechnologyLaboratory

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