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

Sydni Credle, Ph.D., P.E.
Technology Manager
Sensors and Controls
University Training and Research
Modeling, Simulation and Analysis
304-285-5255
sydni.credle@netl.doe.gov

Briggs White, Ph.D.
Technology Manager
Water Management
High Performance Materials
412-386-7546
briggs.white@netl.doe.gov
## Budget

### All Crosscutting Budget Lines

<table>
<thead>
<tr>
<th></th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>FY20*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensors &amp; Controls</td>
<td>$3.65M</td>
<td>$7.5M</td>
<td>$8M</td>
<td>$8M</td>
</tr>
<tr>
<td>Modeling</td>
<td>$20.85M</td>
<td>$20M</td>
<td>$14M</td>
<td>$14M</td>
</tr>
<tr>
<td>Water Management</td>
<td>$9.8M</td>
<td>$7M</td>
<td>$8M</td>
<td>$8M</td>
</tr>
<tr>
<td>Materials</td>
<td>$8M</td>
<td>$20M</td>
<td>$20M</td>
<td>$20M</td>
</tr>
<tr>
<td>HBCU</td>
<td>$1M</td>
<td>$1M</td>
<td>$2.05M</td>
<td>$2.05M</td>
</tr>
<tr>
<td>UCR</td>
<td>$1.4M</td>
<td>$2.25M</td>
<td>$3M</td>
<td>$3M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$44.7M</strong></td>
<td><strong>$57.75M</strong></td>
<td><strong>55.05M</strong></td>
<td><strong>55.05M</strong></td>
</tr>
</tbody>
</table>

*Continuing Resolution*
# New FOA Awards in FY19

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

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

University Training

Modeling, Simulation & Analysis

Water Management

Sensors & Controls

High Performance Materials

https://netl.doe.gov/coal/university-training
Educational Grant Programs

- **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 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

Since Program Inception Through 2018

UCR Summary 2010 – 2019
• 66 Awards
• $23.1M

HBCU Summary 2010 – 2019
• 35 Awards
• $9.2M
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.
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.
Announcements

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
Questions?

VISIT US AT:  www.NETLDOE.gov

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@NationalEnergyTechnologyLaboratory

CONTACT:

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