# 2021 GridEd Summary Report

As the evolution of the electric industry continues to reshape how energy will be produced, delivered, and used by consumers, EPRI is building and maintaining a formative Workforce Development initiative to develop the next generation of electric power engineers.

Thanks to Department of Energy (DOE) awards in 2013: **G**rid **E**ngineering for **A**ccelerated **R**enewable **E**nergy **D**eployment (GEARED) and in 2019: **G**rid **R**eady **E**nergy **A**nalytics **T**raining (GREAT with Data) efforts are focused on workforce needs at the intersection of the traditional power system and digital systems.

GridEd is currently comprised of EPRI, five (5) Partner universities* via GREAT with Data, utility sponsors, Affiliate universities, and historically black colleges and universities (HBCUs). GridEd empowers students with the latest electric industry knowledge to become competent, well-informed engineers that influence major technological, social, and policy decisions that address critical global challenges.
*(Stony Brook University, University of California-Riverside, University of Texas-Austin**,** Virginia Tech, and Washington State University)
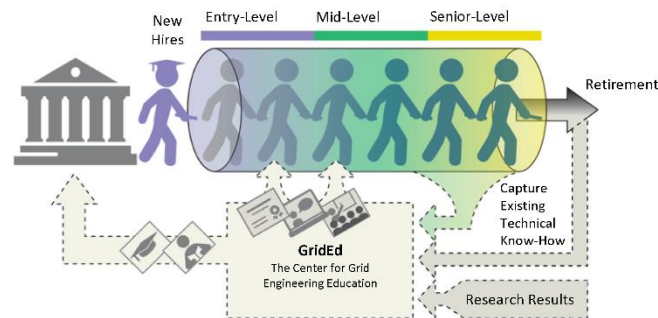
2021 Utility Advisors			
American Electric Power	FirstEnergy	Portland General Electric	Southern Company
Austin Energy	Lincoln Electric System	Santee Cooper	Tennessee Valley Authority
Duke Energy	New York Power Authority	Southern California Edison	Western Area Power Authority

Leveraging the Electric Industry   Since 2013, GridEd has leveraged $7.7M in funding from DOE and another $4.38M from electric utilities and universities. To date, GridEd has engaged 650 utilities, 88 universities, and 50 other electric power industry participants. The program has impacted more than 12,087 university students, delivered short courses to more than 2,000 industry professionals, granting some 14,173 professional training hours (PDHs) since 2019. As a result of those who opted-in for knowledge and competency testing, 252 Certificates of Completions (COCs) were awarded in 2021.

GREAT with Data
GridEd's DOE-funded GREAT with Data initiative trains and educates engineers and data scientists to address issues for merging Grid Operations Technology (OT) and Information Technology (IT) so they can design and develop grid architecture and infrastructure to enable the integration of distributed energy resources (DER), as well as other new trending application technologies that use digital as a process interface in the electric grid.

This effort addresses workforce skills in five key technical areas:
(1) power system fundamentals
(2) data science
(3) cyber security
(4) information and communication technologies (ICT)
(5) integration of distributed energy resources (DER)

The project will train, educate, and recruit qualified personnel into the electric utility industry through enhanced industry coordination and workforce readiness initiatives. New and revised university curricula will prepare incoming engineers and computer scientists for the newly evolving grid architecture and infrastructure. Further, this project will develop credentials for the training and education needed in the electric industry workplace to transform the grid.

Key Results

- Computer Based Training (CBTs) modules are available:
  [Distributed Generation Technology and Applications](#)
- CBTs that are soon to be released:
  Artificial Intelligence (AI) in the Electric Industry
  Load Forecasting
  Introduction to Energy Storage Use Cases and Economics
  Introduction to Energy Storage Technologies
- Recruited five (5) historically black colleges and universities (HBCUs) with sponsorship by GridEd utilities: North Carolina A&T, Prairie View A&M, South Carolina State University, Tennessee State University, and Tuskegee University.
- Added courses to the public repository which currently contains materials for 21 university courses.
- The HR Committee developed a white paper on addressing workforce development challenges with planning techniques and solutions that include, but are not limited to, education and training.
- The final version of a *"University Gaps Assessment in Digital Power Systems Education"* was released (EPRI Report 3002020016).
- *"Grid-Ready Energy Analytics Training with Data (GREAT with Data) Gaps Assessment in Professional Training"* report including the annual course prioritization survey identifying training needs is available.

University Engagement   As of Fall 2021, 11 faculty at our five Partner universities have impacted 376 undergraduate and 315 graduate students by creating and teaching 34 courses in the four topical focus areas of the GREAT with Data initiative. New and revised courses include: Electric Power Distribution Systems, Power Quality & Harmonics, Discrete Data Analysis, and Big Data Systems. Students continue to report being highly motivated, increasingly confident, and interested in power topics. Overall, 94.4% of students are satisfied with their instruction and engagement is extremely high with 87% of students continuing to respond to our requests for reactions and insights.

Affiliate Universities have many opportunities to engage with the GridEd program through shared course materials, funding for student projects, and discounts on attendance in GridEd short courses. In 2020, 25 undergraduate students received funding. Partner universities conducted a series of Tech Transfer seminars to share new course development efforts with Affiliate universities.

EPRI launched a new task that focuses on HBCUs. During 2021, the goal was to become aligned with at least five (5) HBCUs to begin an evaluation and assessment process to determine how the Great with Data project and other GridEd activities could assist with advancing electric power programs at each school. Moreover, the process will first try to identify common needs at the schools and then take a deep dive into specific curriculum and other needs at the individual schools.

2021 Affiliate Universities (U)	
California Polytechnic U	Texas State University
California State at LA	Tuskegee University
Colorado State University	University at Buffalo
Iowa State University	University of Memphis
North Carolina A&T	University of Nebraska, Lincoln
Oregon State University	University of NC, Charlotte
Portland State University	University of Pittsburgh
Prairie View A&M	U of Puerto Rico Mayaguez
South Carolina State	University of South Alabama
South Dakota State University	University of TN, Chattanooga
Tennessee State University	

Human Resource (HR) Committee (Cmte) Several members shared their challenges with the "great resignation," identifying skills needed for the future, assessing current talent for transferable skills, and aligning all of this with the culture of their organizations. All cmte members expressed that the following is an overarching goal held by their HR teams:

> *"To ensure top talent is maintained while we help our organization prepare for the future."*

The white paper mentioned in the Results section of this report analyses the need for a concerted effort to help organizations adapt to change and its impact on the workforce. The paper includes megatrends and drivers that are influencing the future workforce needs of the energy industry.

Feedback from Short Course Evaluations

- *"This will help me evaluate proposed DER installations and better understand the effects of real-life operating conditions."*
- *"I enjoyed the course and will definitely apply what I learned about phase identification and theft detection."*

Professional Short Courses

Four new courses were offered this year: Operations Simulator Training, Electric Vehicle Infrastructure 101, Machine Vision in the Electric Industry, and Cyber Security Operational Technology Equipment Familiarization. Also, a previously provided course was offered again: OpenDSS Training.

Visit http://grided.epri.com/courses.html

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