Educating Power Engineers for a Future Distribution Grid

Center for Grid Engineering Education (GridEd)

A DOE Initiative: Grid Engineering for Accelerated Renewable Energy Deployment (GEARED)

2015 CAPER CSC & Industry Advisory Board Meeting
April 10, 2015

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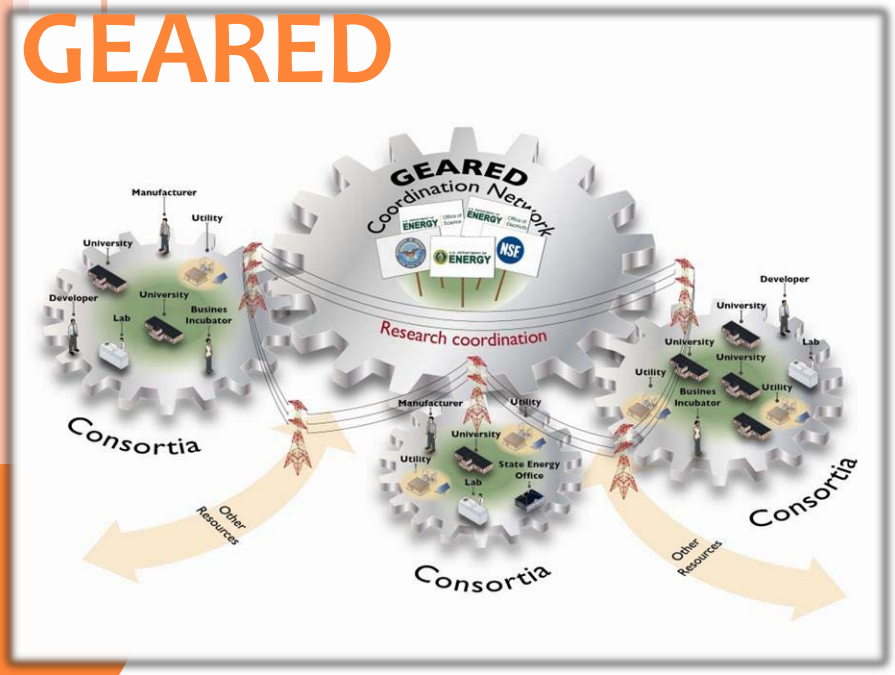
SunShot
U.S. Department of Energy

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

GEARED



PROUD MEMBER OF
IREC
Interstate Renewable Energy Council
TM

EPRI
Electric Power Research Institute

University of Central Florida

MISSOURI®

EPRI ELECTRIC POWER RESEARCH INSTITUTE

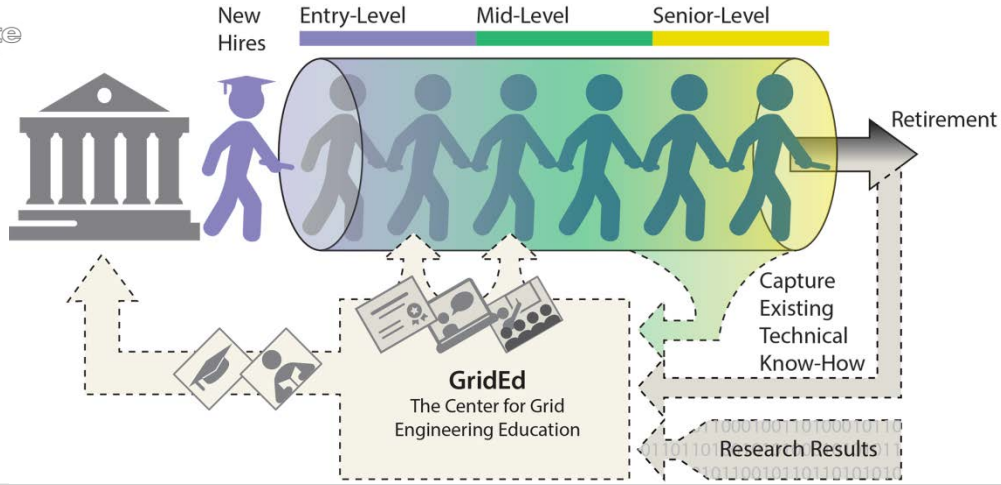
GridEd

The Center for Grid Engineering Education

Georgia Institute of Technology

UNC CHARLOTTE

Clarkson UNIVERSITY defy convention



Scope and Key Milestones

Development of a curriculum and course materials for academic and professional training courses

Deliver short courses on selected topics related to renewable energy

Develop e-learning modules for open-access subscription

Train additional instructors from both academia and utilities to increase the number of competent trainers nationwide

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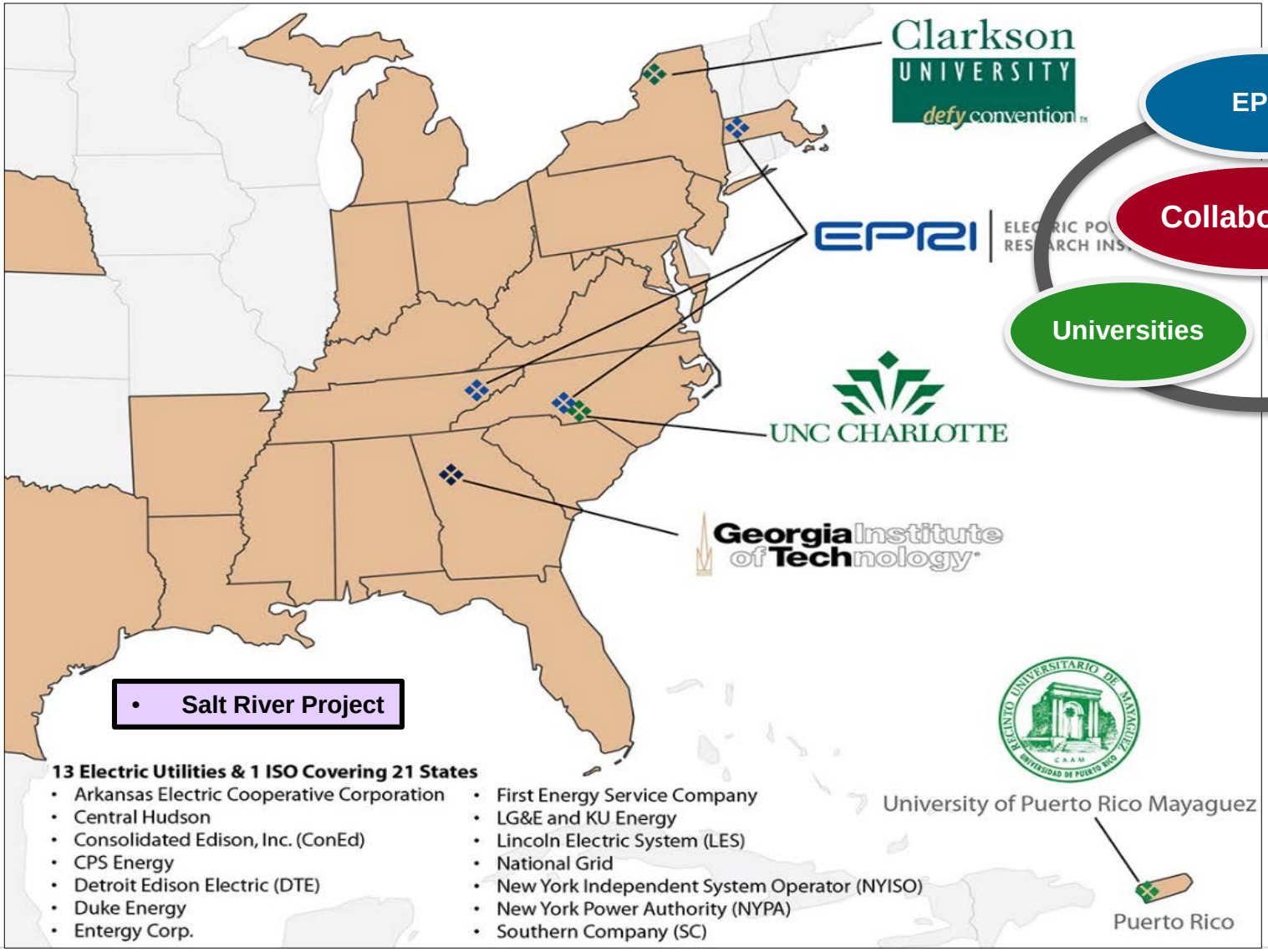
The GridEd Team



Creating Educational Products

Designs to Meet Industry Needs

GRIDED
The Center for Grid Engineering Education

Revised and New Undergrad and Grad Courses

Utility Advisors Workshops

New Graduate Programs

Curriculum/ Performance Review Meetings

Short Courses/ Webinars

Distance and E-Learning Modules

Continuous Evaluation

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Strategy Document on Undergraduate/Graduate Curricula

- **To provide an educational experience to traditional students at the undergraduate/graduate level as well as industry professionals on all issues facing the electric industry, including renewable generation.**
- **To foster collaborative interaction with the electric utility industry, power and energy manufacturers, and electric industry consultants through participation in research projects and design of the educational programs for their workforce.**
- **To provide comprehensive information and incentive to get involved in the energy issues and smart grid to the general public, potential and current students, current industry practitioners, and professionals outside the engineering domain.**
- **To design and implement a sustainable business model to support the long-term impact of GridEd and to foster strong ties with the other GEARED consortia, professional associations like IEEE, among others.**

GridEd – A Tutorial Series (2014)

- **Course1: Distributed Storage & Generation Technologies & Applications**
  - Introduces critical technologies of the future power grid

- **Course 2: Electric Power Distribution Systems**
  - Familiarizes students with distribution grid design and operation

- **Course 3: Dynamic Distribution System Modeling**
  - Learn about the dynamic characteristics of the distribution system of the future

- **Course 4: Business Case Analysis in Electric Utility Industry**
  - Addresses the fundamentals of analyzing business cases which are needed to transition to the future

http://grided.epri.com

Student Engagement

- Objectives:
  - Invest in human capital: inspire, challenge, and support the next generation workforce in power and energy
  - Provide a network for learning, growth, leadership, and enhanced interest in power engineering
  - Generate advice and feedback for GridEd initiatives
- Opportunities for Student Engagement:
  - GridEd Student Innovation Board (SIB)
  - Senior Design Projects & Competitions
  - Other Design/Research Projects & Competitions
  - Student Centered Conferences
  - Internships / Coops
  - Social Media Presence (LinkedIn)

What is the Student Innovation Board?

- **Who?**
  - ~2 students from each GridEd University (1 undergrad, 1 grad)
  - 16 students from 6 universities
- **What?**
  - Advisors to GridEd
  - Communication liaison among GridEd, students, and student organizations on campus
  - Advocate and promote student participation in GridEd activities
    - Student Centered Conferences
    - Design Competitions
    - Research Projects
    - Paper/Poster Presentations
- **How?**
  - Conference calls
  - In person meetings at student centered conferences
  - Directed feedback

Engaging Affiliate Universities

Fundamental Activities

Goal: Extend the experience to a wide university audience, placing much of the power engineering education at regional and perhaps local levels.

Extend University Participation	Each utility can sponsor two universities to participate
Access to EPRI R&D Portfolio	Selected EPRI reports can be purchased by any university for $250.
Tech Transfer Seminars	Sharing of materials, ideas, and best practices created by GridEd
Core Curriculum Courses	Access to featured course material
GridEd Shared Materials	Featured course materials shared and reviewed by ALL
Student Engagement	GEARED Student Centered Conference and Innovation Board.

Engaging Affiliate Universities
Benefits

EPRI/University Partners

- Broaden outreach of EPRI material within academia
- Enhance tech transfer of EPRI research results to members
- Create new university Curriculum

Utilities

- Engage local universities
- Guide and shape curriculum content at universities where future employees are educated
- Provide advanced education to professional staff

Affiliate Universities

- Access to core course material
- Enhanced student engagement in renewable energy deployment
- Industry recognition through affiliation with GridEd and GEARED