



U.S. Power and Energy Engineering Workforce Collaborative  
Press Release  
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### **Engineer Shortage Puts Green Economy and Smart Grid at Risk** *Collaborative Develops Strategy for Change*

As a cornerstone of his energy, environment and economic plans, President Barack Obama urges the country to transform its energy system to make it greener and smarter. But a growing shortage of electric power and energy engineers will make the path to reaching that vision rocky. Due to the aging electrical engineering workforce and educators, there may not be enough engineering support to design, build, operate and maintain the kind of reliable electric energy system that is required in the future.

“The current graduation rate from U.S. university electric power engineering programs is not sufficient to meet our nation’s current and future needs,” commented Wanda Reder, President, IEEE Power & Energy Society, and chair, Executive Council, U.S. Power and Energy Engineering Collaborative. “As an industry, we are working to build a new generation of electric energy resources, transmission lines and distribution infrastructure. At the same time, we want to help customers use energy wisely, reliably integrate renewable generation, secure the grid from cyber attacks, reduce carbon emissions, and make the grid smarter. Steps need to be taken today to develop the electric power engineering workforce for all of this to become possible.”

In response to critical concerns about the power and energy engineering workforce and the education system that supports it, the U.S. Power and Energy Engineering Workforce Collaborative, led by the IEEE Power & Energy Society, has developed a sweeping and detailed action plan. The plan is published in a 14-page report entitled *Preparing the U.S. Foundation for Future Electric Energy Systems: A Strong Power and Energy Engineering Workforce*. It calls upon industry, government and educational institutions to take specific, reasonable and immediate actions to attract more young people to electric power engineering and to support the education system that will make them highly-qualified engineers.

## **The Problem**

Within the next five years, an estimated 45 percent of engineers in U.S. electrical utilities will be eligible for retirement or will leave for other reasons, according to a 2008 survey by the Center for Energy Workforce Development. That percentage translates into some 7,000 power engineers that will be needed in the electric utility industry alone. But the problem doesn't stop there. According to the report, two to three times as many electric power engineers may be needed to fulfill the needs of the entire economy.

The Collaborative analyzed university survey data and concluded that the current graduation rate from university electric power engineering programs is not sufficient to meet the need. The good news is that enrollments in electric power and engineering programs are increasing. The bad news is that they are not rising fast enough, and interest in science, math and technology is low in K-12 students. Enrollments are declining in electrical engineering in general. Among students, teachers, guidance counselors and parents, engineering is ranked low on the list of interesting and attainable professions. Furthermore, women are especially underrepresented in the industry and as students.

Even if universities and colleges were teeming with engineering students, the educational institutions may not be well equipped to handle the demand. The Collaborative estimated that within the next five years, 40 percent of full-time senior engineering faculty will be eligible for retirement and that 27 percent may actually do so. A number of historically strong power engineering programs have ended or are close to doing so. Emerging programs provide hope for the future, but more support is needed. "Besides educating the next generation of power engineers, universities are sources of technology innovations needed for our nation's energy future," Reder says.

## **The Solution**

The shortage may be dire, but a turnaround is possible, as long as stakeholders in the industry, government, and education take concrete steps to recruit more bright minds to the power engineering field and provide top-notch educational opportunities.

In its report, the U.S. Power and Energy Engineering Workforce Collaborative outlines measurable goals that a range of stakeholders can take. The report advocates immediate action to:

1. Double the number of graduate and undergraduate students completing electric power and energy engineering degrees.
2. Provide \$4 million in funding annually for undergraduate power engineering scholarships.

3. Create 2,000 internship and cooperative opportunities for electrical engineering students.
4. Hire 80 new faculty members over the next five years to replace retiring faculty, to meet increased enrollments, and to broaden educational offerings.
5. Raise annual research funding of university power engineering research by up to \$50 million per year over the next five to eight years.
6. Create five University Centers of Excellence to conduct research and education, while also working to increase interest and advance expertise in the power and energy engineering field.

In easy-to-reference lists, the Collaborative's report outlines specific steps that stakeholders can take to meet these goals. For example, state and federal regulators are encouraged to consider how regulatory policies and practices might help industry and the educational community respond to engineering workforce challenges.

The complete report can be downloaded at <http://www.ieee.org/go/pes-collaborative>.

### **About the U.S. Power and Energy Engineering Workforce Collaborative**

The U.S. Power and Energy Engineering Workforce Collaborative, led by the IEEE Power & Energy Society, is an initiative to address concerns about the U.S. power and energy engineering workforce. The Executive Council is made up of members from the following organizations: American Transmission Company, Bonneville Power Administration, Cornell University, Eaton Corp., EPRI, Federal Energy Regulatory Commission, Idaho Public Utilities Commission, IEEE Power & Energy Society, Midwest Energy Inc., North American Electric Reliability Corp., Office of Naval Research, PJM Interconnection, Power Systems Engineering Research Center, S&C Electric Company, Southern Company, and the U.S. Department of Energy.

For additional information contact:

- Wanda Reder, Chair of the Collaborative; President, IEEE Power & Energy Society, [w.reder@ieee.org](mailto:w.reder@ieee.org)
- Anjan Bose, Professor, Washington State University, [bose@wsu.edu](mailto:bose@wsu.edu)
- Francine Tardo, External Communications Manager, IEEE, [ftardo@ieee.org](mailto:ftardo@ieee.org), 732-465-5865