



IEEE Power & Energy Society **SCHOLARSHIP PLUS INITIATIVE®**

Preparing the Next Generation of Power & Energy Engineers

Developing the Power Industry Innovators of the Future

October 2017 – IEEE Switchgear Meetings

Dan Toland, IEEE Power & Energy Society



IEEE Foundation





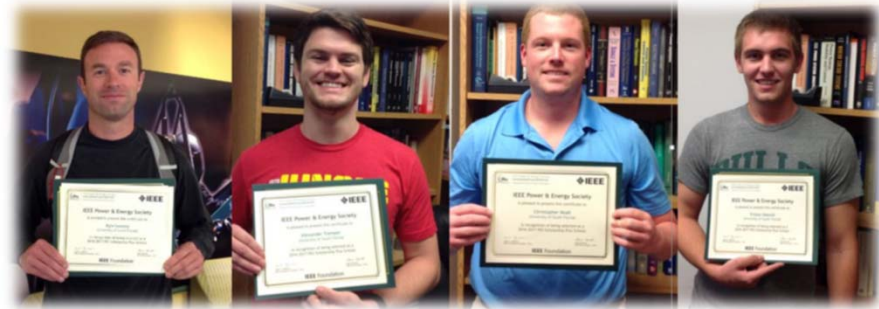
Developing the Power Industry Innovators of the Future



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Overview



- Addresses the impending critical shortage of qualified power engineers in the United States and Canada
- Offers scholarships and career experience to undergraduate students to attract top talent to the power and energy field
- Undergraduate students can receive up to \$7,000 in financial support and assistance in obtaining a career experience prior to graduation
 - An additional \$5,000 is awarded to the top performing student in each Region
 - Application Period - March to June 30th

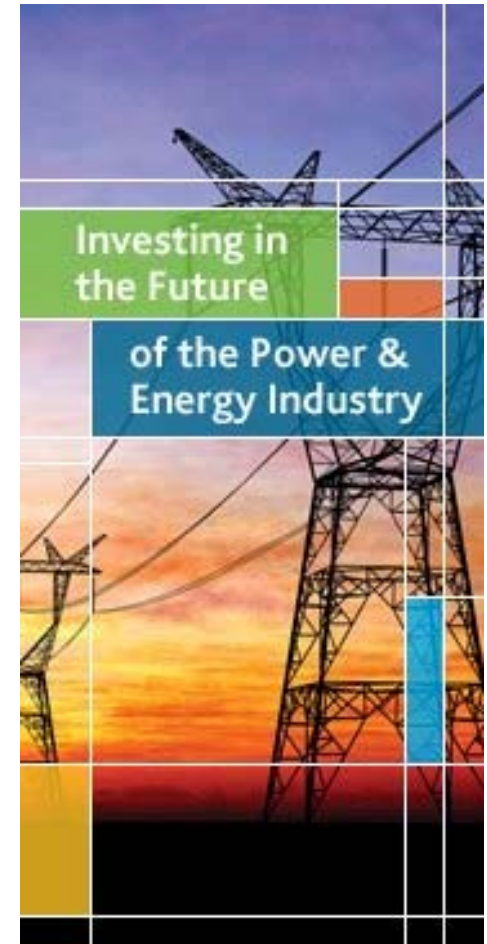


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Program Success

- 1,382 scholarships awarded to 835 individuals attending 190 universities across the USA, Canada & Puerto Rico
 - 300+ students reported having a full time job in power & energy.
- The number of undergraduates going into power engineering careers has about doubled over the last ten years (PES PEEC 2015 Survey)
- \$3.1M awarded in scholarships
- 240+ companies hired a PES Scholar as an intern, co-op
- Expanded to India and Italy



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PES Scholar – Thank you

“The PES Scholarship Plus Initiative is an amazing scholarship. It opens a new door of opportunities such as mentors, employment opportunities, and financial support. I am very grateful towards IEEE and the donors that have made this program possible.”



“The PES Scholarship Plus Initiative helped me get a full time job within the power industry.”



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PES Scholarship Plus Initiative

- Receive up to US\$7,000 in financial support before graduation:
 - US\$2,000 1st year
 - US\$2,000 2nd year
 - US\$3,000 3rd year*
- Assistance in getting up to 2 years of power engineering career experience before graduation
- One free year of membership in the world's largest and oldest technical association – IEEE and its Power and Energy Society
- Can participate in a mentoring program which connects students to experts



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*For applicants awarded in their first year of college

Scholarship Requirements

- Applicants must:
 - Consider a career in electric power and energy engineering.
 - Be working toward an electrical engineering bachelor's degree.
 - Be a full-time student in the coming academic year at a university or college in the U.S. or Canada that offers undergraduate courses in power engineering.*
 - Willing to take at least three of the power engineering courses for a total of nine or more credits.
 - U.S. or Canadian citizen or permanent resident and reside in IEEE Regions 1 through 7.
 - Currently enrolled full-time at a university/college or community college.
 - Current GPA is 3.0 or higher on a 4.0 scale (or equivalent).



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2017-18 PES Scholar Recipients

Region	PES Scholars	Total Schools
1	35	17
2	25	12
3	41	31
4	34	18
5	35	17
6	35	17
7	4	3
9	1	1

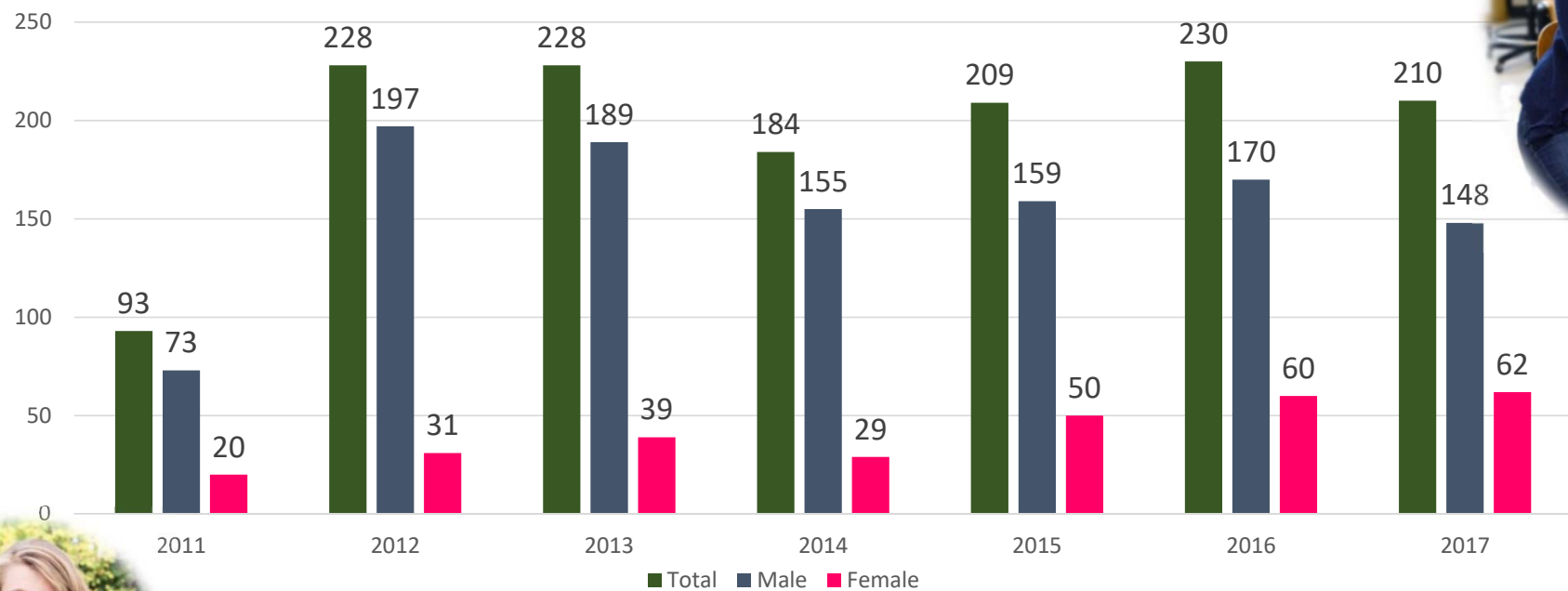
- 7th class of PES Scholarship Recipients recently announced
- 210 Scholarship Recipients from 116 Schools
 - 92 Seniors
 - 87 Juniors
 - 31 Sophomores
- 5 of the 7 top scholars from each Region are female



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PES Scholars by Year/Gender



- The number of female recipients has increased every year since 2012
- 2017 – highest % (30%) and highest number of female recipients



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Schools with most PES Scholars - 2017



7



7



6



Northeastern University

6



5



5



5



5



5



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Schools with most Scholarships

(2011 to 2017)

1. Drexel University - 59
2. University of Illinois at Urbana-Champaign - 42
3. Washington State University – 40
4. Worcester Polytechnic Institute - 39
5. State University of New York at Buffalo - 37
6. Arizona State University – 29
7. North Carolina State University – 28
South Dakota State University - 28
8. Northeastern University -27
University of Washington – 27
9. University of Texas at Austin – 24
10. South Dakota School of Mines and Technology - 23



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Career Experiences

- Learn about the work of power and energy engineers and to get visibility to potential employers
- Required for Scholarship renewal
- Career Experience can be gained in a number of ways
 - Internships
 - Co-ops
 - Power-related summer research
- Provided assistance to students in their own efforts to find career experiences!
- PES Careers is a free IEEE PES online resource that connects power engineering students seeking career experiences with industry



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PES Careers (www.pes-careers.org)

- PES-Careers is an online resource that connects students seeking full time jobs or career experiences with industry for up to one year after graduation
- Career Center Platform currently being upgraded – mobile friendly user interface.
- USA/Canada
 - 1,400+ students registered on the USA/Canada site
 - 375 Companies registered
- Europe/Middle East
 - Relaunching marketing efforts to recruits students & companies
- Another site TBD



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PES Scholars are working at...



... more than 240 organizations

300+ Scholar recipients are now working full time.



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Why Get Involved?



PES Scholars at the 2017 IEEE PES General Meeting – Awards Ceremony



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Why Now?

- During this decade, almost 55% of the power & energy industry has the potential to retire or leave for other reasons (CEWD Survey)
- U.S. Power & Energy Engineering Workforce Collaborative – April 2009
 - Recommended doubling the number of power engineering graduates by awarding scholarships
- February 2015 Survey of Utility Executives indicated the aging of the utility workforce is their second most pressing concern
- Demand for qualified power engineers is projected to increase
 - Projections indicate that, by 2030, the energy sector overall, including the transmission, storage, and distribution segment, will employ an additional 1.5 million workers." - April 2015 Quadrennial Energy Review



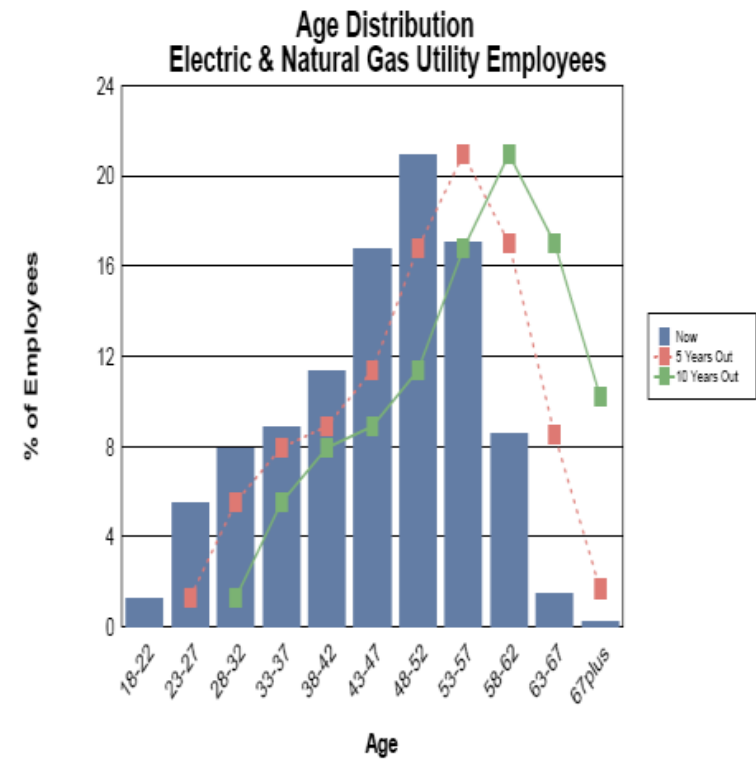
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US Workforce Survey: Age Distribution

- Survey Participants
 - 55 Electric & Gas Utilities
 - All Electric Cooperatives
 - ~ ½ of all US electric & combination utility employees
 - Done in 2007, 2008 & 2009
 - Engineers that may need replacement by 2014 ~51%

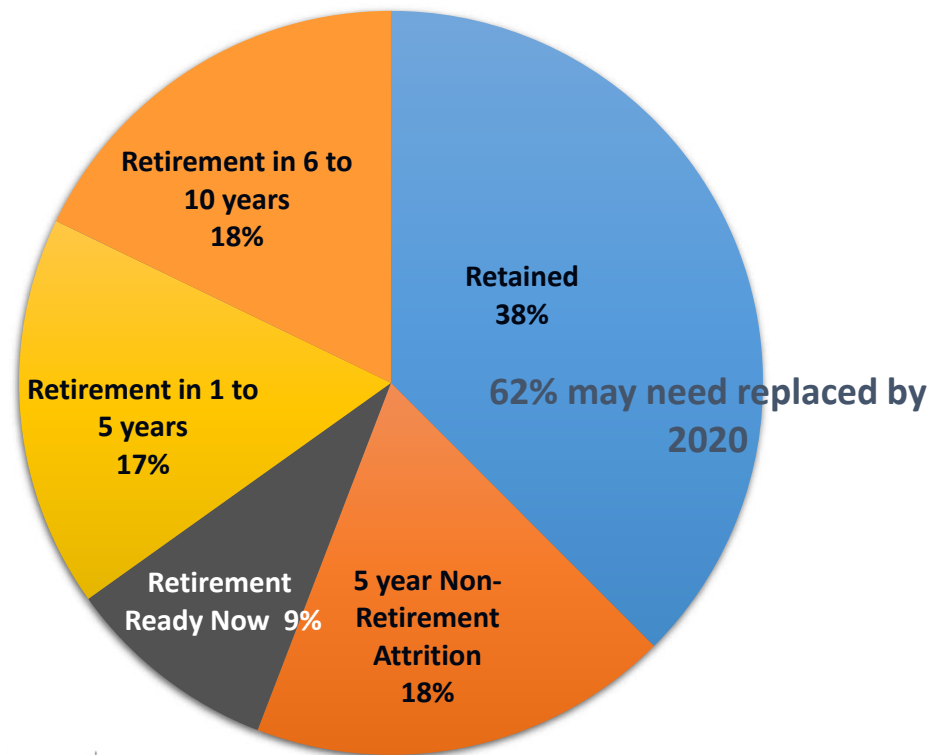
Source: Center for Energy Workforce Development --
Gaps in the Energy Workforce Pipeline Survey



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Total Industry Potential Replacement Impact On Retirement & Non-Retirement Attrition



- **Changing Landscape**

- Industry workforce has decreased by 11,000+ jobs since 2009
- The average age of the workforce has increased to 46.1
- Employees age 53 and above has increased by 5% since 2006
- Employees 30+ years of service has increased by 5.2% since 2006



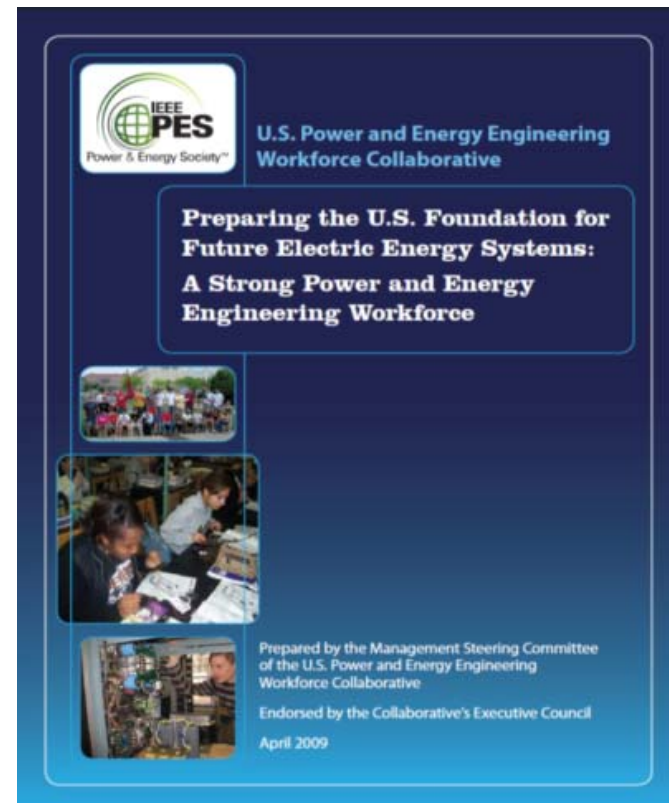
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Source: Gaps in the Energy Workforce Pipeline: 2011 CEWD Survey



The Solution: Workforce Collaborative Report

- Workforce Collaborative Report
- Published April, 2009
- Recommended doubling the number of power engineering graduates and providing scholarships
- Influential in \$100M DOE stimulus education allocation



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Why get involved?



- **It's a Smart Decision**

- A strong application pool reduces time and expenses in recruiting candidates
 - PES Scholars are top undergraduate students from engineering programs across the United States and Canada who have gained valuable professional experience via internships and career experiences.

- **It's about Pride**

- Have a direct impact on the future of the power and energy industry while, at the same time, have influence on your local community.



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Why get involved?

- **It's about Security**

- A strong workforce is critical to meeting future energy needs and supporting economic growth.

- **It's about Opportunity**

- The next generation of energy will depend upon the expertise, experience and innovation of talented power engineers. As more people retire, action must be taken to attract, prepare and recruit those who will carry the power and energy profession forward to meet future challenges.



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Get Involved – Time, Talent, Treasure

- Provide undergraduate electrical engineering students with:
 - Financial assistance – provide a financial contribution to the program
 - Hands-on career experience – publicize your internship opportunities with PES Scholars (www.ee-scholarship.org/sponsorship/donate-now/)
- PES Careers (www.pes-careers.org)
 - Help industry recruit top candidates from the finest engineering programs in the U.S.& Canada
 - Give young engineers the tools to connect with potential employers
- Provide mentoring opportunities for PES Scholars from current experts (www.ee-scholarship.org/how-it-works/mentors/)
- Serve on Regional Review Committee – Review Applications



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Benefits for Participation

- Access to the top undergraduate students who are interested in the power engineering field
 - Undergraduate students available for **internships**
 - Graduating PES Scholars are available for **full time positions**
- Recognized in print, online & event marketing as an organization that is committed to the future
- Opportunity to give back and provide a significant contribution to the power and energy field



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Presidential Level	 
Platinum Level	 Engineered to order. Built to last.
Diamond Level	
Gold Level	ShivKrupa Education Excellence
Silver Level	  An Exelon Company
Bronze Level	        
Mentorship Level	          
Regional Level	       
Local Level	  



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Corporate Donors

Additional Supporters

- Individuals
- 4 PES Technical Chapters (Boston, Phoenix, Seattle, San Francisco)
- 9 PES Technical Committees
 - Computer and Analytical Methods Subcommittee
 - Electric Machinery Committee
 - Intelligent Systems Subcommittee
 - Power System Dynamic Performance Committee
 - Power Systems Relay Committee
 - Substations Committee
 - Reliability, Risk and Probability Applications
 - Transmission and Distribution Committee
 - Working Group on Distribution Reliability



Thumbnail of Success

- Building a pipeline of power engineers
 - 1,382 Scholarships distributed
 - Over 300 students in the workforce
- Building curriculum at Universities across the USA
- Raised \$6.5M on a \$10M goal
- Creating power engineering career awareness
- Built volunteer infrastructure for execution
- Increasing student awareness and membership in PES
- Building a younger PES membership age demographic
- PES-Careers site connects students and industry
- Increasing gender diversity



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PES Scholar – Thank you

“This is a great program! Glad there are so many female participants. Get the word out more so people can apply sophomore year and receive the scholarship even earlier in their education!”



“Thank you so much for this program. The PES scholarship has absolutely strengthened my resolve and passion to become a power engineer. In the future I hope to work with renewable energy technology, and maybe obtain further education in the field. Once again thank you so much for everything.”

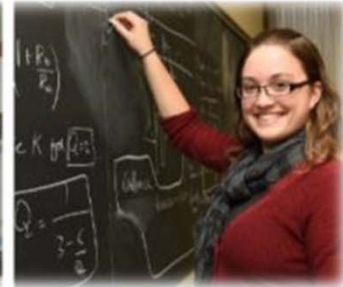


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PES Scholars



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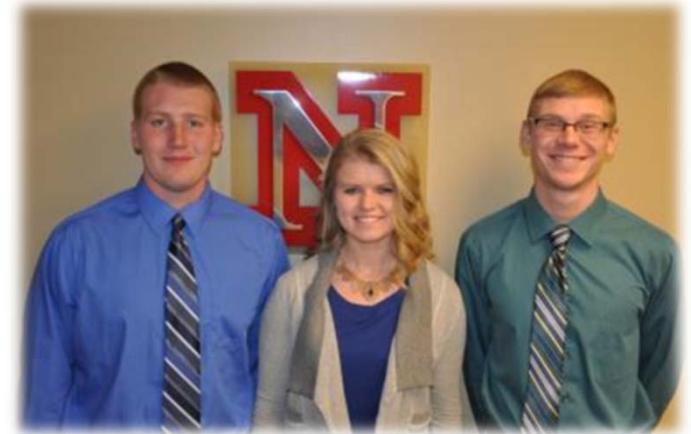
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