

OGE Energy Corp.'s Sean Trauschke:

Growing Sustainable Communities Through Economic and Workforce Development

Fleet Electrification: What Large Customers Need from Electric Companies

DTE Job Training Program Offers Prisoners a Second Chance



36

44

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MAGAZINE MANAGEMENT IN AMERICA'S INVESTOR-OWNED

ELECTRIC COMPANIES

features

September/October 2019, Volume 44, Number 5

26

Growing Sustainable Communities Through **Economic and Workforce Development**

Energy and economic development go hand in hand. From the street lights that guide us home to the incubator that supports a struggling new life to technologies that serve as the backbone of the modern economy, the people of the electric power industry energize lives, and livelihoods. Our relationships with our communities are symbiotic, in that we are only as strong as those we serve.

By SEAN TRAUSCHKE

36

Fleet Electrification: What Large Customers **Need from Electric Companies**

The electrification of the transportation sector is well underway in the United States. A 2018 report from EEI and the Institute for Electric Innovation found that there are more than 1 million electric vehicles already on U.S. roads, with more than 18 million expected by the year 2030.



DTE Job Training Program Offers Prisoners a Second Chance

DTE Energy, through a unique initiative, is offering a second chance to a group of prisoners preparing to reintegrate into society, while developing a trained and dedicated workforce to fulfill a critical need in Michigan. A group of 24 prisoners eligible for parole will spend the next six to nine months in the program, training for careers in tree trimming.



тне







The Edison Electric Institute (EEI) is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for about 220 million Americans, and operate in all 50 states and the District of Columbia. As a whole, the electric power industry supports more than 7 million jobs in communities across the United States. In addition to our U.S. members, EEI has more than 65 international electric companies, with operations in more than 90 countries, as International Members, and hundreds of industry suppliers and related organizations as Associate Members.

departments

September/October 2019, Volume 44, Number 5

6

powering change

Working together to stop scams

8

news + trends

Updates and events impacting today's electric power industry

22

security matters

Harnessing innovation to improve grid security

24

energycareers@work

New student registration site helps companies support students in STEM

46

interconnections

Sharing our story with regulators

48 company spotlight

Southern Company launches new energy storage research center

FOR MORE CONTENT

electricperspectives.com



ON THE COVER: Sean Trauschke, chairman, president, and CEO of OGE Energy Corp. and OG&E, on economic and workforce development.

(Photo courtesy: OG&E)

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National Key Accounts Workshop

October 6-9, 2019

Cosmopolitan | Las Vegas, NV

EEI's semi-annual National Key Accounts Workshop is the venue where national, chain, and multi-site energy users can tackle all of their energy-related needs. Customers will learn about the latest in public policies affecting the energy industry, meet with their electric company account and energy supply representatives, and learn about new technologies, products, and services designed to save them money.

Plan to attend if you are...

- In need of conveying your company's concerns and energy priorities to the electric power industry
- Managing corporate energy expenses
- Building new locations or retrofitting existing facilities
- Exploring existing or custom energy efficiency incentive opportunities
- Responsible for sustainability initiatives

Register for the EEI National Key Accounts Workshop at www.eei.org/meetings EEI's National Key Accounts Workshop is the premier event in the energy industry; no other conference has a greater benefit for Staples and attending simply makes good business sense. At EEI, we connect with long-term partners and gain knowledge of future industry trends, policies, and energy challenges. It keeps us informed and helps us maintain our leadership position—we wouldn't miss it.

Bob Valair Director, Energy & Environmental Management Staples



Working Together to Stop Scams

By BRIAN L. WOLFF

ne of the most rewarding parts of the work we do at EEI is bringing attention to the ways that America's electric companies are transforming customer service.

Customers are always the focus of everything our industry does, but the ever-increasing connectivity of today's business environment gives companies new opportunities to engage with the people and communities they serve. EEI member companies are using the tools of the digital age to create exciting new customer offerings, give customers more control over their energy experience, and build more personal relationships with customers than at any other time in the more than 100-year history of our industry.

More and more, they also are stepping up to protect customers.

I recently was notified that EEI has won an award we are quite proud to accept. In October, the American Society of Association Executives (ASAE) will present EEI with a 2019 Power of A Gold Award for our efforts to protect customers through Utilities United Against Scams (UUAS).

The award is "ASAE's highest honor, for associations that go above and beyond their everyday mission to undertake initiatives that benefit America and the world."

UUAS is a consortium of more than 130 U.S. and Canadian electric, water, and natural gas companies, and their respective trade associations, dedicated to stopping scams targeting our customers. EEI is a founding member, as are many EEI member companies.

The organization tracks scammers and their tactics, works with law

What to Do If You Are a Victim of a Scam

If you think you have been a victim of an internet scam and made a payment, call your financial institution immediately to let them know. Also call your utility company to report the scam, disconnect your computer from the internet, and run an anti-virus scan.

Know the signs to **#StopScams**

Know the signs to **#StopScams**

AGAINST SCAMS

UTILITIES UNITED

Delete Suspicious Emails

Your utility company will never ask for your Social Security number, driver's license number, password, or financial information by email.

enforcement to shut them down, advises regulators on how to use policy to protect customers, and educates customers on how to protect themselves from con artists who sometimes impersonate company employees to prey on our communities. Its Utility Scam Awareness Week campaign, held each November, helps to raise public awareness of scammer tactics.

This isn't the first time UUAS has been recognized. The organization won the Toll-Free Industry's Fraud Fighter Award in 2018, in recognition of efforts to shut down more than 2,200 toll free numbers once used by scammers to target our customers.

Despite that success, our industry's efforts to fight scammers are growing more vital. To give just one example, PSEG Long Island said in August that it had received nearly 4,000 reports of scam calls through July of this year—nearly as many as the company received in all of 2018.

The scams are not just more numerous. They are growing more



sophisticated. Customers reported scam calls with caller ID screens that identified the caller as PSEG, and recorded prompts that mimicked those the company uses, so that even customers familiar with PSEG's systems might be fooled.

Despite the increasing threat, PSEG Long Island (a UUAS member company) has had success fighting the scammers through public awareness campaigns. In 2015, in 8.2 percent of the total number of reported calls, customers became victims. Since 2018, that number is down to 5 percent.

These threats may be proliferating, but our industry's spirit of service and creativity in finding new ways to deepen relationships with our customers have led to proactive efforts to stop scams. We're proud to see those efforts recognized by ASAE and by the Toll-Free Industry. EP



Celebrating Lineworkers

n July 10, EEI joined the International Brotherhood of Electrical Workers (IBEW), the Utility Workers Union of America, and the National **Electrical Contractors Association** in saluting the nation's nearly 75,000 electrical lineworkers. America's lineworkers maintain and enhance the energy grid and work day and night in all conditions to ensure that customers have reliable and safe access to the energy they need to power their lives. National Lineworker Appreciation Day is celebrated each year on July 10, and it honors the life and work of Henry Miller, the first president of IBEW.

"The nation's lineworkers are the face of America's electric companies, and they truly are deserving of our appreciation today, and every day," said EEI President Tom Kuhn. "Lineworkers are among the first responders in the wake of storms and other disasters, and we are grateful to these dedicated men and women, and the families who support them, for the work they do to power our lives."

Kuhn and IBEW International President Lonnie Stephenson authored a joint op-ed on the invaluable role played by the nation's lineworkers: "All of us rely on the hard work and commitment of our nation's lineworkers to keep our country and our communities running. Please join us and #ThankALineworker, not just on National Lineworker Appreciation Day, but every day. The work they do ensures that the energy we depend on to power our lives can get where it is needed, when it is needed, while keeping electricity costs affordable."

This year's celebration in Washington, DC, centered around two Capitol Hill events, both featuring lineworkers from EEI member companies. The first involved demonstrations of some of the tools and techniques lineworkers use to



Representatives Donald Norcross (D-NJ) and David McKinley (R-WV) pose with lineworkers to celebrate a bipartisan resolution recognizing National Lineworker Appreciation Day.

maintain and enhance the energy grid, followed by a reception allowing members of Congress and their staffs to meet lineworkers and featuring the signing of a bipartisan resolution in recognition of National Lineworker Appreciation Day. More than 100 members of Congress co-sponsored this resolution, up from 27 co-sponsors last year.

"As an electrician who worked in the field for years, I know firsthand the dangers facing lineworkers," said U.S. Representative Donald Norcross (D-NJ), an IBEW electrician and a member of the House Subcommittee on Education and Labor. "These hardworking men and women keep our country running every day. Plus, they are quick to respond when called upon to get the power back on following hurricanes and other natural disasters. Lineworkers are unsung heroes and I'm proud to support all efforts to acknowledge their hard work."

Representative Bobby Rush (D-IL), chairman of the House Energy Committee, echoed this support: "Lineworkers are the backbone of the energy sector, and these highly skilled, well-trained workers utilize new technology through the use of apprenticeship programs, continued education, and safety practices to help transition the nation into a cleaner, more sustainable energy future."

This year, for the first time, members of the Canadian Electricity Association also celebrated lineworkers on July 10—one reflection of the North American electric power industry's partnership across national borders and of the dedication and talent of its men and women. Whenever called upon, workers from U.S. and Canadian electric companies work hand in hand to restore power for customers.



Representative Donald Norcross (D-NJ), an IBEW electrician, met with lineworkers at an event recognizing their service as part of National Lineworker Appreciation Day.



Lineworkers demonstrated some of their equipment and techniques for members of Congress and their staffs outside the Capitol.

Electric Companies Continue Energy Storage Expansion

Electric companies own and operate many different types of energy storage technologiesincluding pumped hydropower, batteries, thermal, compressed air, and flywheel-and use storage to provide multiple benefits for electricity customers and the energy grid. Battery storage is the principal technology driving the energy market today, and, according to EEI's new report, Energy Storage Trends and Key Issues, battery deployment is forecast to double in 2019, building on a fivefold increase from 2013 through the first quarter of 2019. Since 2015, approximately two-thirds of total capacity-based investment in battery storage technology came from electric companies.

Additionally, the report highlights how electric companies help to maximize the benefits of energy storage, noting that "electric companies are critical partners for advancing a robust, sustainable energy storage industry, given their unique ability to maximize the value of energy storage for the benefit of all customers." Energy Storage Trends and Key Issues provides an overview of recent state and federal policy developments impacting energy storage and features recent notable storage projects from EEI member companies.



NextEra Plans Hybrid Wind-Solar-Storage Project

NextEra Energy is one of the many EEI member companies investing heavily in energy storage. The company's NextEra Energy Resources division has announced plans to develop the nation's largest hybrid renewable facility, a 700-megawatt (MW) project named Skeleton Creek that will serve members of Western Farmers Electric Cooperative in Oklahoma. Skeleton Creek will include 250 MW each of wind and solar capacity, as well as 200 MW/800 megawatt-hours of battery storage, and it is projected to be completed by the end of 2023.

The project is similar to the Wheatridge Renewable Energy Facility, to be built through a partnership between NextEra Energy Resources and Portland General Electric Company and announced in February 2019, that will combine 300 MW of wind generation with 50 MW of solar and 30 MW of battery storage.

Updated Electric Power Industry Data Available

EEI has published updated versions of two guides providing key information on the structure and operations of the electric power industry. Both are available for download at www.eei.org.

- The Statistical Yearbook of the Electric Power Industry contains more than 120 data tables and charts with preliminary data for 2018, as well as more comprehensive data for 2017. Among the topics covered by charts and data in the Statistical Yearbook are generating capacity; annual average capacity factors by generation technology; net generation; retail sales, customers, and revenues; electricity usage; electric operations and maintenance expenses; transmission pole miles; and additional operational and financial data.
- Profiles and Rankings of Investor-Owned Electric Companies—2019 is a comprehensive resource of investor-owned electric holding company and operating company information, including snapshots of holding companies and the latest available comparative industry benchmarking data.

Careers in Energy Week Boosts Education and Engagement

Careers in Energy Week—October 14–18—was created by the Center for Energy Workforce Development (CEWD) and its members to celebrate and raise awareness of energy careers and their importance to communities, states, and the nation. By celebrating Careers in Energy Week, energy companies and State Energy Workforce Consortia connect with customers and communities, helping them to understand the vital role of energy companies in the economy and the exciting, rewarding job opportunities they offer.



Throughout the weeklong observance, energy companies sponsor a variety of activities, events, contests, and presentations for students, teachers, families, and others to learn about energy careers. Among the ways energy companies are preparing in 2019 are:

- Encouraging state governors to proclaim October 14–18 as Careers in Energy Week;
- Preparing open houses tailored to veterans, women, and high school students;
- Preparing energy career contests for students and energy classroom activities for teachers;

- Organizing hands-on activities at local schools with company engineers, lineworkers, and others;
- Distributing classroom materials focused on energy to schools; and
- Building awareness of the industry's diverse, rewarding career opportunities on social and traditional media.

CEWD has developed a Careers in Energy Week toolkit that includes sample energy career presentations for middle and high school students, a social media guide, and more, available at www.CEWD.org.

Electric Companies Respond to Summer Heat and Storms

This summer, a variety of extreme weather events impacted customers and communities around the country, from Tropical Storm Barry (which reached hurricane strength briefly as it made landfall in Louisiana) to dangerous heat waves to destructive thunderstorms that struck parts of the Midwest and East. In each case, electric companies mounted safe, efficient, effective, and robust power restoration responses.

During Barry, EEI and the **CEO-led Electricity Subsector** Coordinating Council were heavily engaged, holding daily coordination calls with senior officials from the U.S. Department of Energy, FEMA, and the U.S. Department of Homeland Security and with the operations and communications leads from electric companies in the path of the storm to discuss the preparation and staging activities underway; mutual assistance planning and readiness; the response and recovery; and critical safety messaging.

Emphasizing Safety and Preparedness

Safety is the electric power industry's top priority every day, and, in September, EEI and its member companies join the federal government and many other industries, organizations, and citizens in observing National Preparedness Month. Ready, the national public service campaign that educates Americans on how to prepare for, respond to, and mitigate emergencies, has designated the theme of this year's campaign as "Prepared, Not Scared. Be Ready for Disasters." The campaign's website, www.ready.gov, provides materials to help with planning for severe weather and other emergencies.



GENERATOR SAFETY

National Preparedness Month

Never use a portable generator inside your home, garage, crawl space, or anywhere exhaust fumes can enter into enclosed spaces.

#PrepareNow

EEI also offers resources that member companies can share with customers to help ensure that they are ready if—and when—disaster strikes. EEI uses its website and social media channels to amplify the industry's efforts to help families and communities prepare for emergencies such as earthquakes, floods, hurricanes, tornadoes, and wildfires. Also available from EEI are materials providing information on what to do during a power outage, a checklist for

putting together an emergency power outage kit, and materials explaining the industry's mutual assistance process and how power is restored.

EEI and its member companies also educated customers on critical safety issues on 811 Awareness Day (August 11), a multi-industry observance reminding members of the public to stay safe when working outdoors—and, especially, to call 811 prior to any excavation or digging project. Entergy

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Please send a brief outline of your proposed article to Sean Tucker, deputy editor, at stucker@eei.org. Thank you for your continued readership of *Electric Perspectives*.







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Advancing Interoperability in EV Charging

In collaboration with EEI, the Alliance for Transportation Electrification, American Public Power Association, and National Rural Electric Cooperative Association, the Electric Power Research Institute (EPRI) has released a report exploring the challenges and opportunities of enabling greater interoperability and standardization in electric vehicle (EV) charging in the United States.

Interoperability of Public Electric Vehicle Charging Infrastructure addresses how four challenges may impact customers, electric companies, and charging site hosts:

- Charging network-to-charging network interoperability;
- Charging station-to-network interoperability;
- Physical charging interface interoperability; and
- Vehicle energy grid interoperability.

"It is more important than ever that we focus on making the customer EV charging experience seamless and convenient, and that means identifying the technical requirements that will enable us to



meet the expectations of EV drivers," said Lisa Wood, EEI vice president of customer solutions. "It is critical that investments in EV charging infrastructure lead to options for EV drivers that are convenient, easy to use, and secure."

"Interoperability provides customers and the market with the transparency needed for EV charging to evolve in an efficient and resilient manner," said Arshad Mansoor, EPRI senior vice president of research and development. "Collaboration in this effort will be important as infrastructure continues to scale."

The paper, which can be downloaded at www.epri.com, offers recommendations for implementing open standards and protocols for EV charging that enhance customer convenience, confidence, and security.

Adding More Truck, Bus Charging in California

San Diego Gas & Electric (SDG&E) has received approval for a major program that will help to electrify large vehicles and industrial equipment by installing charging infrastructure for a minimum of 3,000 plug-in mediumand heavy-duty electric vehicles and equipment, including transit buses, school buses, delivery trucks, and forklifts. This initiative also will support the electrification of refrigerated semi-truck trailers, used for transporting perishable goods. SDG&E notes that, in California, heavy-duty vehicles produce more particulate matter than all of the state's power plants combined.

SDG&E's new project will be the first large-scale initiative of its kind in the region. "Imagine a future where zero-emission trucks carry produce and merchandise to your local stores and zero-emission school buses pick up and drop off your children," said Estela de Llanos, vice president of clean transportation, sustainability, and chief environmental officer at SDG&E. "With this new initiative, our region is headed to a new phase of the clean transportation movement."

Electrifying transportation—including commercial and industrial transportation operations—offers numerous benefits for customers and communities, including reduced emissions, quieter operation, and increased efficiency. Learn more on p. 36.

Recognizing Diversity Initiatives

On July 11, at the 36th annual Business Diversity Conference in Nashville, EEI presented the 2019 Business Diversity Awards, which recognize companies for their outstanding efforts in advancing opportunities for diverse suppliers, including minority-, women-, investor-, veteran-, and LGBTQowned businesses within the investorowned electric power industry.

- DTE ENERGY earned the industry's overall Excellence Award for its dedication to partnering with women- and minority-owned businesses, strengthening the local economy. In 2018, DTE spent \$472 million with certified diverse suppliers, which represents almost 20 percent of the company's total spend. "Congratulations to DTE for winning this year's Excellence Award for its commitment to developing and maintaining a strong network of diverse suppliers," said EEI President Tom Kuhn. "DTE demonstrated how both electric companies and their suppliers can be successful when they work together on workforce and business development to ensure that the supplier base reflects the communities they serve."
- SAN DIEGO GAS & ELECTRIC (SDG&E) was the recipient of EEI's Innovation Award, which recognizes a company that promotes business diversity by any new approach through technology, software, project management, or outreach efforts that result in increased business development for its suppliers or efforts that make a substantial economic impact. SDG&E developed a custom online portal for its suppliers to enter their monthly spend with diverse subcontractors, allowing the company to track and audit subcontractor spending to ensure the use of diverse subcontractors.

ENGINEERED SOLUTIONS, INC.

(ESI) received EEI's Diverse Business Award, which is given to a company that displays support of business diversity through development initiatives. This veteran-owned business offers a broad range of consulting services with a focus on custom mechanical and electrical engineering and design services. For more than 11 years, ESI has worked with the Tennessee Valley Authority (TVA) to provide quality and timely electrical and digital design services.

The Prime Supplier Leadership Award was presented to PHILLIPS AND JORDAN, INC., (P&J), a civil and infrastructure contractor that is a certified woman-owned business. For more than 60 years, P&J has worked with TVA while consistently supporting fellow diverse businesses in the process. After developing a small and diverse spending program in 2013, P&J consistently has spent 40 to 52 percent annually with small and diverse businesses. In 2018, that number was 44 percent of P&J's spend.

DOE Studies Versatile Test Reactor

On August 5, the U.S. Department of Energy (DOE) announced that it will begin an environmental impact study for a one-of-a-kind Versatile Test Reactor (VTR) that would provide data on future nuclear fuels and materials to be used in advanced nuclear power plants. If DOE ultimately constructs the 300-megawatt VTR, it would be the nation's first new test reactor in decades. The sites under consideration for the reactor include Idaho National Laboratory and Oak Ridge National Laboratory in Tennessee.

One month earlier, DOE awarded \$1.7 million to six university-led projects that will enable development of instrumentation and tools for VTR experiments.

"This testing capability is essential for the United States to modernize its

nuclear energy infrastructure and for developing transformational nuclear energy technologies that reduce waste generation and enhance nuclear security," said U.S. Energy Secretary Rick Perry. "Lack of a domestic reactor with versatile fast-neutron-spectrum testing capability is a significant national strategic risk affecting the ability of DOE to fulfill its mission to advance the energy, environmental, and nuclear security of the United States and promote scientific and technological innovation."

"DOE needs to develop this capability on an accelerated schedule to avoid further delay in the United States' ability to develop and deploy advanced nuclear energy technologies," said U.S. Assistant Secretary for Nuclear Energy Rita Baranwal. "If this capability is not available to U.S. innovators as soon as possible, the ongoing shift of nuclear technology dominance to other international states such as China and the Russian Federation will accelerate, to the detriment of the U.S. nuclear industrial sector."

Nuclear energy remains the largest source of carbon-free electricity in the United States: currently, 98 reactors in 30 states supply more than half of America's carbon-free electricity and approximately 20 percent of all electricity. A diverse and domestic energy mix is critical to the safe, reliable, affordable, and increasingly clean electricity customers expect, and generating facilities that offer 24/7 energy, including nuclear energy, play a vital role in sustaining a clean, diverse, and reliable energy mix.

On Capitol Hill and with the administration, EEI is advocating for increased research and development funding and support for the range of technologies needed to achieve clean energy goals, including existing and next-generation nuclear, as well as energy efficiency, energy storage, renewables, other carbonfree technologies, and carbon capture utilization and storage.

Officials Support Accelerating EV Adoption

Over the summer, several organizations representing state and local elected officials adopted statements and resolutions supporting greater electrification of the nation's transportation.

- At its annual meeting, the United States Conference of Mayors-the non-partisan organization of cities with populations 30,000 and larger-ratified "Accelerating Electric Vehicle (EV) Adoption Across America," a resolution recognizing the importance of investments in transportation electrification for reducing carbon dioxide and other emissions. "As mayors, we are committed to the transition of all vehicles on our roads to zero emission technologies," the resolution states. "[We urge] the Administration and the United States Congress to enhance the federal EV tax credit, expand incentives to other vehicle classes, and invest in EV infrastructure to ensure the transition occurs on an accelerated time frame." The resolution also notes the value of EVs for reducing petroleum consumption, saving customers money, supporting U.S. jobs, and promoting national and economic security.
- During the Climate Mayors Summit, leaders from 127 cities across 38 states joined the Climate Mayors EV Purchasing Collaborative, committing to purchasing more than 2,100 EVs by the end of 2020. The commitment includes the purchase of electric transit buses, fire apparatus, ambulances, police cars, and garbage trucks. The Collaborative also has announced plans to hold a competitive bid on electric school buses by the end of the year.



"The Nation's Clean Car Promise" is a resolution signed by 24 governors, representing more than half of the U.S. population, calling for a single strong, nationwide clean car standard and supporting preserving state authority to protect residents from vehicle pollution. The letter comes as the Administration is finalizing a rule that would relax fuel efficiency and greenhouse gas standards. The governors promised to continue to pursue additional concrete action to fulfill the promise. As EEI's member companies lead America's clean energy transformation, EEI is advocating that public policies should put customers first, focus on outcomes, support progress, and accelerate innovation. Transportation emissions now are the largest source of emissions in the United States, and transportation electrification provides an opportunity to leverage the significant reductions in power sector emissions to achieve reductions in transportation sector emissions.

news + trends

EEI Chairman Chris Crane Discusses Impact of Energy Innovation

EEI's member companies are leading a profound transformation of America's energy, delivering an energy future that is smarter, stronger, cleaner, more dynamic, and more secure for all customers. To explore how the electric power industry is creating this future. EEI Chairman and **Exelon Corporation President** and CEO Chris Crane spoke with Neil Bradley, executive vice president and chief policy officer at the U.S. Chamber of Commerce, at a symposium convened by the Chamber's Global Energy Institute on July 31. Crane joined other key energy officials, executives, and thought leaders who explored how innovative projects and technologies are shaping the energy landscape of today and tomorrow.

"It all focuses around serving the customer and being able to evolve the company," Crane said. He described some of the innovative partnerships with technology companies that Exelon is pursuing to advance electrification and offer additional options to its customers. "If we want to get electrification rolling, we have to figure out how to seed it and get it done," he said. Crane also highlighted Exelon's annual Innovation Expo, which brings together thousands of employees and vendors to share hundreds of original concepts that benefit electricity customers.

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Cybersecurity Awareness Month Highlights Electric Companies' Leadership

The nation observes Cyber Security Awareness Month in October, and electric companies continue advancing their "defense-indepth" approach to protecting the energy grid against all threats and developing even greater cyber and physical security protections for critical energy infrastructure. Safeguarding the energy grid and ensuring a reliable and affordable supply of energy for customers are top priorities for EEI's member companies.

The electric power industry has forged a strong partnership with the federal government through the CEO-led Electricity Subsector Coordinating Council (ESCC), greatly enhancing the ability of electric companies and federal agencies to work together to enhance sector-wide resilience to cyber and physical security threats. Among the initiatives the ESCC has created to develop the industry's security posture are:

CYBER INCIDENT RESPONSE— The ESCC has developed the first-of-its-kind Cyber Mutual Assistance (CMA) program to help electric and natural gas companies, public power utilities, and electric cooperatives restore critical computer systems following significant cyber incidents. Modeled after the industry's traditional mutual assistance program, the CMA program now includes more than 155 entities across all segments of the industry, serving more than 75 percent of all U.S. electricity and natural gas customers. The ESCC also is working with senior government officials on a unified cyber incident response strategy.

The electric power industry has forged a strong partnership with the federal government through the CEO-led **Electricity Subsector** Coordinating Council, greatly enhancing the ability of electric companies and federal agencies to work together to enhance sectorwide resilience to cyber and physical security threats.

 CYBERSECURITY INFORMATION SHARING—The industry is working closely with the Department of Energy (DOE) and other stakeholders on public-private partnerships to help organizations assess and strengthen their cybersecurity capabilities and to facilitate timely bi-directional sharing of actionable unclassified and classified threat information using advanced collection, analysis, and dissemination tools that identify threat patterns and trends.

- R&D ALIGNMENT—The ESCC collaborates with the federal government, the national labs, and the investment community to discuss the latest grid security and resilience research and to align R&D needs and priorities. The ESCC is continuing its work with the Electric Power Research Institute and key government agencies to assess the threat posed by electromagnetic pulses, and the ESCC's R&D Committee is exploring how the sector can develop and maintain the robust communications capabilities that would be needed during a prolonged power outage.
- CROSS-SECTOR COORDI-NATION—In 2016, the ESCC appointed CEOs to serve as liaisons to the communications, downstream natural gas, financial services, transportation, and water/wastewater sectors, and they are helping create important partnerships with these critical infrastructure sectors. The ESCC is building on these efforts by bringing together executive-level representatives from the electricity, communications, and financial services sectors to identify mutual priorities and to develop cross-sector incident response plans.
- STATE COORDINATION—The ESCC is working with state and federal government stakeholders to discuss how the industry, state officials, federal partners, and regulators can align resources and priorities, unify their message, and enhance overall awareness of incident management and resilience planning.

- ESCC PLAYBOOK—The ESCC developed a playbook that provides senior industry and government executives with a framework to coordinate response and recovery efforts and communication with the public during major incidents. The playbook is updated annually and is tested in a series of exercises and real-world events.
- INCIDENT RESPONSE
 MESSAGING—The ESCC's public affairs initiative enhances how industry and government communicators prepare for emergencies affecting the energy grid. Senior government public affairs officials and industry communications executives meet each year to discuss how they

share information and coordinate messaging during a major incident. The group developed a communications annex to the ESCC playbook, which includes lessons learned from recent hurricane response operations to help guide industry-government message coordination.

 PREPAREDNESS EXERCISES— Each year, the ESCC participates in a variety of preparedness exercises to test and update its coordination and messaging protocols. These include regional events, DOE's Clear Path exercise series, FEMA's National Level Exercises, and industry-wide national exercises that test the response to catastrophic incidents. The most significant national exercise, the GridEx series sponsored every two years by NERC, includes hundreds of organizations and thousands of participants from industry, government, and international partners who examine the response to widespread outages caused by coordinated physical and cyber attacks. The ESCC and its government partners play a major role in both the exercise and the follow-up process to identify action items that will help improve industry and government response. Previous GridEx events have launched ideas that are now useful tools, such as the ESCC playbook and the Cyber Mutual Assistance program. EP



Harnessing Innovation to Improve Grid Security

By BOB BLUE

ver the past several years, the CEO-led Electricity Subsector Coordinating Council (ESCC) has helped strengthen and protect the energy grid by bringing industry and government together on a number of critical security initiatives. One particularly significant focus is research and development (R&D). Aligning the expertise and capabilities of both industry and government, the ESCC's R&D Committee has harnessed innovation to improve grid security.

The committee is co-chaired by my colleagues Gil Quiniones, CEO of the New York Power Authority, and Andy Ott, who recently retired as CEO of PJM Interconnection. They have focused on several top-of-mind issues, including electromagnetic pulse (EMP) attacks and automated mitigation strategies for cyber threats. The committee's current top priority is developing resilient communications capabilities that our sector could use in emergencies, and they are taking a two-pronged approach to this effort.

First, they have worked with companies across our sector to draft a strategic framework that will guide the development of these new capabilities. This framework was based on self-assessments of current emergency communications capabilities, and it includes a methodology for prioritizing communications links for black start operations and an evaluation criterion for selecting an emergency system. We must look beyond the horizon to identify future technology priorities for our sector.

The development of the framework is informing the second phase of this project—a test of actual communications technologies. Later this fall, several companies, including Dominion Energy, will participate in a proof of concept demonstration to examine the comparative benefits of commercially available resilient communications technologies. Following the test, the committee will work with the Electric Power Research Institute to develop a comprehensive report detailing the lessons learned.

While this important project is front and center today, Quiniones and Ott recognize that we must look beyond the horizon to identify future technology priorities for our sector. Therefore, they are hosting a first-ever ESCC and Department of Energy (DOE) roundtable this September with researchers from many of DOE's national laboratories to discuss some of the industry's most challenging emerging threats and issues, including advanced cybersecurity strategies and quantum computing.

The roundtable will help increase awareness of current lab projects and strengthen ongoing DOE and national lab partnerships with our sector. It also is designed to help inform the ESCC's long-term strategic R&D priorities, provide insights into the energy workforce needs of the future, and identify any research gaps in areas that are critical to the security and resilience of the energy grid.

Following the roundtable, the ESCC will continue to engage with our partners at DOE and its national labs to identify, develop, and deploy cutting-edge technologies that strengthen and protect our infrastructure. This ongoing partnership will help align industry and government priorities and ensure that we can continue to maintain a resilient energy grid for our customers. EP



BOB BLUE is executive vice president of Dominion Energy, and president and CEO of Dominion's Power Delivery Group. He also serves as a member of the Electricity Subsector Coordinating Council.

The Electricity Subsector Coordinating Council (ESCC) serves as the principal liaison between the federal government and the electric power sector, with the mission of coordinating efforts to prepare for, and respond to, national-level disasters or threats to critical infrastructure. The ESCC includes electric company CEOs and trade association leaders representing all segments of the industry.



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Online registration opens Fall 2019. Questions? Check out www.csweek.org or call 903-893-3214.

New Student Registration Site Helps Companies Support Students in STEM

By JOHN BRUCKNER

nergy companies require a workforce with command of advanced technologies and the scientific principles that guide the development of tomorrow's smart energy solutions. We also require a diverse workforce dedicated to, and drawn from, the communities we serve.

We have a tremendous opportunity to enhance our workforce and help our communities develop the interests and talents of young people by connecting with students, encouraging them, giving them the resources they need to succeed, and helping them build the competencies that our industry depends on.

To help energy companies develop the workforce of the future, CEWD, in partnership with Southern Nuclear and Georgia Power, has created a Get Into Energy/Get Into STEM Student Registration Site available to member companies. Both sponsoring companies already are using the system.

Built for students in grades 6 through 12, the site helps companies develop and maintain relationships with students who have shown an interest in energy careers.

CEWD members can enroll company-sponsored programs such as FIRST Robotics competitions, high school Energy Pathway programs, and school events—in the system, which then lets students join. Joining is simple. Students over the age of 13, or parents of younger students, can register on any computer or smartphone. Students and parents use the site to create a profile and to provide contact information member companies can use to stay connected to students throughout their school career, and even after they leave high school. Their privacy is protected, and students can unsubscribe at any time.

Participating member companies can download student information on an ongoing basis, and can stay connected with families in a proactive way, either by email or text message, to inform them of educational opportunities, point them to scholarships, help them navigate their way toward an energy industry career, and notify them of mentoring and internship opportunities. Member companies can search for students by school, program, and date of graduation, in order to provide them with relevant information.

CEWD member companies interested in being featured on the site should contact their regional CEWD consultant. CEWD will register eligible programs, create a company-branded landing page, and provide a company-branded handout with instructions on joining that can be distributed to students and parents. Participating companies only will see student and parent data related to their own programs and events. CEWD members serve customers and communities across the country. And, we invest in school and community programs to make sure that, as students grow, they have the skills needed to excel. CEWD's new student registration site lets member companies build relationships and provide targeted support to young people as they prepare for their future and, potentially, for careers in the energy industry.

By creating innovative partnerships and programs like the Student Registration Site, CEWD is helping our members shape our future workforce that is as dynamic, diverse, and resourceful as our industry itself—the workforce that will become leaders in our industry as we create an even more exciting energy future for customers. EP



JOHN BRUCKNER is CEWD chair and president, National Grid New York.

Formed in March 2006, the Center for Energy Workforce Development (CEWD) is a non-profit consortium of electric, natural gas, and nuclear companies and their associations: American Gas Association (AGA), American Public Power Association (APPA), Distribution Contractors Association (DCA), Edison Electric Institute (EEI), National Rural Electric Cooperative Association (NRECA), and Nuclear Energy Institute (NEI).



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Join chief executive officers, chief financial officers, treasurers, and investor relations executives from the electric power industry as they meet with the financial community at the EEI Financial Conference. This conference features general sessions, panels, and company financial presentations, providing delegates with the opportunity to exchange information on critical industry issues.

For more information, contact Devin James | (202) 508-5057 | djames@eei.org

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Growing Sustainable Communities Through Economic and Workforce Development

SEAN TRAUSCHKE

Chairman, President, and CEO OGE Energy Corp. and OG&E

Energy and economic development go hand in hand. From the street lights that guide us home to the incubator that supports a struggling new life to technologies that serve as the backbone of the modern economy, the people of the electric power industry energize lives, and livelihoods.

UR RELATIONSHIPS with our communities are symbiotic, in that we are only as strong as those we serve. At OG&E, one of our key priorities is growing our communities through leadership in economic and workforce development.

With nearly 117 years of service, we've seen our industry grow and change in ways our founders could never have imagined. But the change we saw in our first century is nothing like what the industry has experienced in the past decade.

From adopting smart technologies and working with distributed generation to embracing evercleaner sources of energy, electric companies are taking steps today to prepare for the energy future. That future is not just about technology. It also is about developing a workforce with the skills and desire to support a strong, sustainable industry here, and across the country.

Electric companies are high-tech employers, but also are woven into the communities we serve. Unlike other technology companies our customers interact with, we are, by our nature, local. We have equipment and people spread throughout our service areas, and we employ our neighbors.

When it comes to developing the workforce of the future for our industry, and for our communities, who is better positioned than electric companies?

A tour of our workforce development efforts shows that, ultimately, what's good for our industry turns out to be what's good for our customers, our neighbors, and our environment. A robust electric power industry bolsters communities, and elevates us all. »

A Workforce in Transition

The industry workforce has changed significantly over the last decade, but is benefiting from more than a decade of workforce initiatives to develop and hire workers into critical jobs. As industry hiring has increased and retirements have slowed, a younger and more diverse workforce is emerging.

According to a 2017 Center for Energy Workforce Development survey (more on that organization later), 35 percent of investor-owned electric and natural gas company employees are older than 53. Almost 30 percent are millennials.

A retirement raises not a question of whether to fill or eliminate a job, but a chance to ask ourselves how to better meet customers' needs. It's an opportunity to rethink each job and its skillset to ensure that new hires are the right hires and have the needed skills to help us build for the future.

> A workforce steadily growing younger creates opportunities. At OG&E, we've made it a practice to be thoughtful about open positions. A retirement raises not a question of whether to fill or eliminate a job, but a chance to ask ourselves how to better meet customers' needs. It's an opportunity to rethink each job and its skillset to ensure that new hires are the right hires and have the needed skills to help us build for the future. Today, our workforce includes data scientists, system architects, and other technology-oriented

roles that weren't a part of our workforce a generation ago.

Advances in technology and changes in fuel sources are driving system upgrades and plant conversions. Both often lead to workforce reductions and require workers who have a new set of core skills. At OG&E, we have converted two coal units to natural gas, and we were the first in the state to install large-scale wind and solar farms. As an early adopter of smart technology, we deployed smart meters across our system.

Each advance required retraining and redeploying former plant operators and meter readers into other roles that benefit from their technical expertise. As the industry continues to evolve, we must build reskilling programs into our plans, ensuring employees are able to develop new competencies that allow them to compete for future jobs.

Building an Industry-Wide Workforce

As an industry, we must work with community, industry, and education partners to fill the pipeline of qualified candidates to meet our future workforce needs. We must be prepared to respond quickly to new technologies and changing customer expectations, while remaining focused on reliability, resiliency, affordability, and stewardship.

That means caring not just for our own workforce, but for those of the partners we depend on.

A growing trend in the industry is the use of contractors to respond to changes in workforce demand. At times, contractors can make up more than half of the workforce of some electric companies. In order for our workers to perform their jobs safely, we need to know that the contractors and vendors we engage have qualified, skilled workers who will work beside us safely.

We also need to ensure that the upstream energy companies (oil, natural gas, and coal) are staffed properly to provide our fuel and other resources safely and quickly. Ultimately, we need to ensure there are enough qualified



candidates to fill all jobs across our energy ecosystem.

A rising tide floats all boats. OG&E is leading the charge to encourage the industry to build a strong, diverse pipeline of talent for which all employers can compete. As an industry, if we partner in the classroom, we can all compete on the field, providing a prime environment for future growth by developing the talent pool. That pool today includes college graduates, vocational and career graduates, former military members, and professionals from other industries.

Promoting Lifetime Education

Historically, when electric companies are recruiting, they focus on recent graduates from high school or college. At OG&E, we're expanding our efforts to include the full educational spectrum, from elementary school through high school, career tech, community college, trade schools, and universities.

We realize that many people don't consider energy a glamorous industry. We need to examine our value proposition and rethink how we position ourselves as potential employers. As our industry continues to evolve—embracing technology and moving away from fossil fuels we need a workforce with interest in, and awareness of, STEM. If we want young people to aspire to energy jobs, we need to start early, educating parents on the benefits of working in our industry.

In Oklahoma, energy is one of the largest employers in the state, making up one-quarter of the entire workforce. The average salary exceeds \$100,000, and is trending upward, making us one of the highest-paying industries. Plus, we're growing. Energy is expected to add 20,000 more jobs by 2025.



Yet many parents think of energy as difficult, dirty work. They associate us with bucket trucks, roughnecks, pipeline workers, and infrastructure repair, which are the roles most visible to them. While those jobs are essential to today's electric companies, so are business analysts, engineers, instrumentation and control techs, and cybersecurity experts. Part of our educational focus must be on making parents aware of the potential of the energy industry, as well as the fundamental skills their children would need to join us in service.

We want parents to talk about the industry's ability to provide good, high-paying jobs, and to encourage their children to consider careers in energy. By incorporating energy into the state's educational curriculum, we establish career awareness and potential (even foundational building blocks and competencies), long before graduation.

Bridging the Skills Gap by Supporting Career and Technical Education

Many of our most critical roles, including lineworkers, technicians, and operators, require more than a high school diploma, but less than a four-year college degree. According to the National Skills Coalition, these types of jobs will grow to 56 percent of the total workforce by 2022.

Like many EEI member companies, OG&E is a member of CEWD, a nonprofit consortium of companies and organizations working together to develop the industry's future workforce. Some of CEWD's most effective programs work to close the skills gap. The organization provides training toolkits and skills development curricula, focusing on must-have skills, specifying necessary credentials, and guiding employers on how to engage best with educators at all levels, including career and technical education (CTE) schools and community colleges.

Many states organize their CTE curricula around the 16 Career Clusters framework, created by Advance CTE—a nationwide organization of state CTE directors.

To guide public and CTE schools in building curricula that support the needs of our future workforce, OG&E has begun advocating for a Career Cluster focused on the energy space. The 16 existing Career Clusters represent nearly 80 career pathways, bridging secondary and postsecondary curriculum to ensure students have the skills necessary to pursue careers post-graduation.

Currently, skills relating to energy are spread across a number of existing Career Clusters, including agriculture, making it difficult for students to identify an energy career path. By creating a dedicated energy cluster, we can raise awareness of the industry and make it easier for students to pursue the wide variety of jobs available in the energy sector.

By mapping areas of future need and identifying schools in those regions that can help close the skills gap, electric companies can ensure their hiring needs and candidate pool are aligned geographically. Working hand in hand with trade schools and community colleges, we can ensure a robust pipeline of talent for years to come.

Supporting College Students and Competing for Their Talents

In hiring, we're competing not only with other energy-sector companies and contractors, but other tech-dependent businesses as well.

At the college level, OG&E has programs and partnerships designed to give students exposure to the ways their classroom learning translates to the workplace. At Oklahoma State University's Okmulgee campus, we've installed a model control station that will be used to train future power plant operators. In partnership with the Price College of Business at the University of Oklahoma, we've created a job shadowing program that allows us to meet and engage with top business students to build awareness of potential jobs in the energy sector.

By beginning the recruiting process before students graduate, we are better poised to compete with consulting firms, finance, and other industries when it comes to hiring top talent.

Attracting Veterans

Veterans are a particularly good fit for many energy industry jobs. They have advanced technical training, are trained to think on their feet, and many have worked directly with energy equipment after all, the U.S. military is among the world's largest users of electricity.

Veterans are a particularly good fit for many energy industry jobs. They have advanced technical training, are trained to think on their feet, and many have worked directly with energy equipment—after all, the U.S. military is among the world's largest users of electricity.

According to the U.S. Department of Energy, veterans make up approximately 10 percent of the energy workforce, exceeding the national average of 6 percent. A 2017 CEWD survey found an even higher number—11 percent.

Many of those transitioning out of the military possess key skills that would be directly applicable to the energy industry, but they may lack formal training and industry certifications, or not know how to



explain their military experience to civilian hiring managers when applying for jobs.

One way to ease this process for military members is for electric companies to participate in programs like CEWD's Troops to Energy Jobs program and the Transition Assistance Program, which helps service members begin the process of finding a civilian job before separating from the military. Currently, OG&E works with Fort Sill in Lawton, Oklahoma, connecting soon-to-beseparated service members with open positions that fit their existing skillsets. Service members are offered internship positions of up to six months, with the potential to hire on full-time post-separation if the position is a good fit.

Developing a Strong Regional Workforce

Beyond our own hiring needs, electric companies benefit from supporting local communities in their efforts to build sustainable economies. At OG&E, we provide training for our communities, arming them with the tools to retain existing businesses and recruit new ones. Local leaders who understand economic development are poised to support that growth over time.

We know that affordable energy is a key driver for businesses when they consider relocation, but quality of life matters as well. Studies have shown that Millennials and Generation Z care deeply about where they live. To compete with other states—and countries—for talent, we need communities where people want to live, work, and socialize, as well as good jobs. In 2018, the OG&E Foundation provided more than \$1.5 million in grants to support programs, organizations, and institutions that enhance quality of life in the communities we serve.

We encourage communities to be aggressive in their local economic and community development plans. We are committed to the recruitment of companies that are a good fit, both for local communities and for the state. After all, the more dollars you have within your local economy, the more you can enhance the quality of life and quality of place through built and natural environments, economic prosperity, cultural entertainment, and recreational opportunities for residents at all stages of life. Sustainable communities need long-time residents who want to stay and grow, as well as a steady flow of newcomers.

New businesses create jobs, but, for companies to relocate, they need confidence in the local workforce-a pipeline of talent with the right skills for their current and future hiring needs. Smaller communities sometimes struggle to retain skilled workers, who leave for larger cities that provide more employment opportunities. A shrinking or unskilled workforce makes it difficult for communities to attract investment and encourage growth. By helping to attract new businesses to our service territory, we grow our base, spreading costs across a larger number of customers to help keep electricity prices low. In turn, low prices are an important catalyst for attracting new businesses and residents. This system works, as we continue to see new customer growth meet, and sometimes exceed, our historical growth rate.

Investing in Communities

Those economic development efforts bring us back to where we started—woven into the communities we serve. Big-picture thinking about economic development and programs to support lifetime education helps us build the workforce of the future. So does touching lives in our communities, one by one.

Like many electric companies, OG&E provides college scholarships to deserving high school graduates, regardless of their field of study. Our summer interns participate in Oklahoma City's Greater Grads, a program that offers networking opportunities for interns across the city, enabling them to forge bonds with peers and to build community. We also work with organizations like Teach For America, providing mentors for novice teachers to support them in their first years in the classroom.

By building healthy economies, we are able to retain and grow the residential population needed to sustain workforce growth across the region and to keep electric bills low for residents and businesses.

The electric power industry is special because, as much as we are a high-tech enterprise powering global growth, technological transformation, and a cleaner environment, we also are local businesses, intimately knitted into the communities we serve. We hire our neighbors. We keep their lights on. We help to teach their children.

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Big-picture thinking about economic development and programs to support lifetime education helps us build the workforce of the future. So does touching lives in our communities, one by one.

At OG&E, we are doing our part to ensure that our state, our communities, and our industry have a diverse workforce with the right skills to attract quality jobs. Our workforce development efforts see us invest in everyone, from elementary school students to college graduates and returning veterans.

That means taking a holistic approach to the health of the communities we are fortunate to serve and to live in. **EP**



SEAN TRAUSCHKE

is chairman, president, and CEO of OGE Energy Corp. and OG&E.



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What Large Customers Need From Electric Companies

The electrification of the transportation sector is well underway in the United States. A 2018 report from EEI and the Institute for Electric Innovation found that there are more than 1 million electric vehicles already on U.S. roads, with more than 18 million expected by the year 2030.

lectric vehicles (EVs) have significant environmental and financial benefits. Reducing pollution from cars, trucks, and buses is especially important to help address local pollution in our communities, and electric transportation is key to helping improve local air quality. In large parts of the Northeast and California, passenger vehicles are the principle driver of smog formation, as power sector emissions have been reduced substantially in recent years.

Further, EVs produce at least 54 percent fewer greenhouse gas (GHG) emissions per mile than the average new gasoline car, and increased EV deployment will reduce emissions of GHGs and criteria pollutants from the transportation sector. This all comes as our industry's clean energy transition has resulted in a decrease in power sector carbon emissions nationally by 27 percent from 2005 levels, and EEI members are on track to reduce their emissions by about 50 percent from 2005 levels by 2030. These benefits are also economic ones: EV drivers spend the equivalent of about \$1.20 per gallon, based on average residential electric rates.

To date, most growth in electric transportation has occurred in the private vehicle market.

Overall, there are more than 260 million vehicles on American roads, according to the Bureau of Transportation Statistics. At least 11.4 million of those are large trucks and tractor trailers. Millions more are pickup trucks, delivery vans, and passenger vehicles owned and operated by commercial fleets.

The business case for going electric may be even stronger for fleet operators than it is for the drivers of family cars, thanks to economies of scale. Though the benefits of EVs are more dramatic at fleet scale, so are the challenges.

EP spoke with the fleet and energy buying executives behind two of America's largest commercial fleets, as well as the nation's largest manufacturer of heavy-duty trucks, about what they need from electric companies as they pursue electric transportation.

Conversations have been edited for length.≫

Walmart, Inc.

ALMART, INC. is, by many measures, the world's largest retailer. Headquartered in Bentonville, Arkansas, the company operates more than 11,000 stores worldwide, including in all 50 U.S. states.

This requires a simply massive logistics operation. Walmart's fleet needs include everything from long-haul trucks bringing goods across the country to small forklifts that rarely leave the store.

EP spoke with Steve Chriss, director, energy and strategy analysis, and Jennifer Wheeler, senior manager, supply chain sustainability.

EP: What's driving Walmart to pursue electric and other alternative fleet vehicles? Is it economics? Sustainability goals? Investors?

WHEELER: We have several corporate sustainability goals. Two specifically that are really driving our interest in alternative fuel vehicles: we want to see an 18 percent reduction in absolute emissions and be powered by 50 percent renewable electricity by 2025.

We want to be a good steward to our communities, too. The business case for a lot of these vehicles is still in development, but there are definitely benefits, such as zero, or near-zero, emissions, and lower maintenance costs.

EP: How far along in the fleet electrification process are you?

WHEELER: We have about 6,500 diesel class 8 heavy-duty trucks. We

also have yard trucks at our distribution centers that move trailers in and around those facilities.

We have a very dynamic network. We're not an out-and-back fleet. Depending on workload, where we need additional capacity, etc., our drivers may be away from the Walmart facility they are based out of for their entire work week.

With fleet electrification, there are two paths we'd like to look at:

In the near term, it's electric yard trucks. Because, with those, we don't have to worry about national infrastructure. Everything is contained right there in the yard. That's made it easier for us to experiment with solutions. We have one electric yard truck in our operation today.

In the longer term, it's electric heavy-duty, over-the-road trucks. That's where we need to start. I'm very engaged in how that could apply to our fleet. But without a national infrastructure, there's a damper on adoption.

That being said, they aren't on the market today, so we haven't been able to do any testing yet in order to understand how they integrate into our operations.

EP: What are some of the challenges you've encountered thus far?

WHEELER: On the yard truck side, the cost is significant to purchase this equipment. Electric yard trucks run about three times as much as a diesel yard truck, and they're not fully out in the market yet, so the price is still relatively high.

Our equipment doesn't sit idle for very long, whether it's a yard

truck or an over-the-road semi truck. So how much charging we can fit in a very short amount of time is something we're still trying to understand. With the yard trucks, the tests that we've done, typically we have about 3 hours a day for charging.

Standardization is another challenge that we see. Everyone wants to win in this space, but there's only a finite amount of physical space in a facility.

We can't have an Orange EV charging station and a Tesla charging station and a Daimler charging station all in one facility. There needs to be some kind of standardization within industry. Otherwise, that's going to prevent us from adopting the technology and getting it to scale.

Electrifying a whole fleet—that's a LOT of power that's going to be required. As more over-the-road electric vehicles are available to test, that's something we want to understand a lot more of—what does a charging strategy need to look like? How does all of this integrate into each other? How can we meet our sustainability goals and save our customers money?

On the over-the-road truck side, range anxiety is a huge challenge for us right now. Because of limitations in range, this is very much a whiteboard exercise for us at this point. Until we can get a couple of these over-the-road trucks to start proving these hypotheses, we just have a lot of theories and a lot of objectives that we want to test.

EP: How can electric companies support your company as you move toward fleet electrification?



Walmart's energy efficiency projects have included collaborating with Peterbilt, Roush Engineering, and other partners in designing its Advanced Vehicle Experience—a concept hybrid truck demonstrating many innovations that increased fuel efficiency.

WHEELER: From my perspective, I think we need flexibility to test and learn.

We don't know what it's going to look like if we put five over-the-road heavy-duty trucks into a system. What time are they going into the facility to charge? How long will they be charging? Right now, those are unknowns.

CHRISS: I think there's definitely an opportunity to partner with electric companies as we figure through the energy management strategy. I think really having strong engagement between the electric company representatives and the customers is going to be critical. When you think about the scale we're talking about—if we have 150 trucks, and each has a 1-megawatt (MW) battery, and we need to charge 10 at once, we need 10 MW into a distribution facility to manage that.

There's a lot of strategy around how much that's going to cost. There are physical infrastructure questions. That's where there's going to need to be a lot of partnership between the electric company and the customer.

How the national infrastructure for high-powered chargers develops is really going to control how we develop our strategy going forward.

We're going to need to see the electric industry take the lead in what a national EV infrastructure will look like. Right now, we see some electric companies very engaged, others much less so. This is a nationwide question for us, so a patchwork answer won't work.

Cox Enterprises, Inc.

OX ENTERPRISES employs about 55,000 people across five continents. Its subsidiaries include Cox Communications, one of America's largest cable companies; Cox Media Group, a broadcasting and publishing company; and Cox Automotive, which provides marketing and software solutions to automotive dealers and consumers and publishes several industry publications, including *Kelley Blue Book* and *AutoTrader*.

EP spoke to Jim Bigelow, senior director, enterprise fleet, and Robert Fairey, senior director, energy procurement and waste diversion.

EP: What's driving Cox to pursue EVs and other alternative fleet vehicles? Is it economics? Sustainability goals? Investors?

BIGELOW: Our company culture is about protecting the environment and leaving the world in a better place for the next generation. We fundamentally believe that supporting sustainable technologies is the right thing to do and good for business.

FAIREY: Cox is committed to solving today's most pressing problems, including environmental issues, and has three main corporate sustainability goals: We plan to be carbon neutral by 2044, water neutral by 2044, and send zero waste to landfills by 2044.

EP: How far along in the fleet electrification process are you?

BIGELOW: We have a little more than 15,000 vehicles. That includes everything from

passenger cars all the way up to class 7 heavy trucks. Throughout our fleet, we have sprinkled in every type of hybrid and green technology except for hydrogen.

At Cox, we have three distinct business units, which gives us the opportunity to experiment.

For example, in our Cox Automotive group, our sedans are all hybrid vehicles. In fact, we've added a little more than 400 hybrid sedans in the last couple years alone.

As far as the extent we're willing to go—that really depends on automaker technology and advancements. We would start purchasing all green vehicles tomorrow if that option were available to us.

EP: What are some of the challenges you've encountered thus far?

BIGELOW: On the fleet side, I can give you a couple. With compressed natural gas, the challenge is the physical space that the tank takes up. We've tried this in our Cox Communications tech vans—which are mostly mid-roof Ford Transit vans. All of the space in those vehicles is devoted to workspace. So, if I use 18 or 20 percent of that space to install a natural gas tank, that takes away from our technicians' workspace.

I'm surprised that manufacturers aren't farther along with electric vehicles. We want to try electric passenger vans and cargo vans, but those aren't readily available yet. And, range is a huge limitation. The range of existing EVs just doesn't work with many of our routes. One of our biggest hurdles is sorting through what is a viable green solution as opposed to what someone is marketing as one. A lot of times, a manufacturer will come to us with something they propose as a green solution, but we have to do our own due diligence to determine whether it really works as they say.

FAIREY: You bundle a handful of things when you look at the overall return on investment and whether you pursue a different technology. One consideration is the current infrastructure at our sites. For example, when our employees are looking at whether to charge their electric vehicles, what does it take for us to give them that ability?

BIGELOW: Aside from electric companies, I think a future challenge is automakers' ability to keep up with their commitments. When they name a date a certain vehicle will be available, we'd like to be able to plan around that.

EP: How can electric companies support your company as you move toward fleet electrification?

FAIREY: Certainly, electric companies can help us determine what's the best method of service. Perhaps it could be some assistance with electrical work. A lot of times, the parking lot is in the front of the building, and the switchgear is in the rear. The cost associated with getting charging stations to the parking lot when the existing infrastructure is elsewhere is definitely something electric companies could help us address.



Cox Enterprises' fleet of more than 15,000 vehicles includes many different fuel technologies, such as hybrid bucket trucks and diesel-powered vans.

That, and rates, so we're not penalized. Charging during peak periods, or demand charges, has a huge impact at this scale. When you tack on demand charges along with energy costs, compared to unleaded fuel at a reasonable price right now, it can add up. Especially in certain markets, where we're seeing reasonable prices for other forms of energy, electricity rates are an issue. And it may take some creativity there on the part of electric companies and regulators.

Providing additional transformer distribution might be helpful.

BIGELOW: An additional consideration is that some of our vehicles are home-start, so another issue would be if they want to bear the expense of installing a charging point at the employee's house.

Daimler Trucks North America

DAIMLER TRUCKS NORTH AMERICA is the largest manufacturer of heavy trucks in the United States. The company notes that 52 percent of the trucks operated by the 100 largest fleets in America carry its Freightliner badge. The company also operates Thomas Built Buses and the Mitsubishi Fuso line of trucks and buses.

EP spoke with Rustam Kocher, charging infrastructure lead with Daimler's e-mobility group.

EP: What's driving Daimler to pursue electric and other alternative fleet vehicles? Is it economics? Sustainability goals? Investors?

KOCHER: Daimler Trucks is driven to provide the best-performing, most cost-efficient trucks in the marketplace. We believe, in the future, that electric trucks will provide the best Total Cost of Ownership (TCO) to the customer. Two things will have to happen before that TCO is positive: a common charging standard being developed by CharIN [an association of automobile and electrical equipment manufacturers dedicated to "the worldwide promotion and support of the Combined Charging System"] under an initiative we are leading; and cheaper, lighter, and more energy-dense batteries, which all indications show are coming.

EP: How far along in the fleet electrification process are you?

KOCHER: At the end of 2019, we will have nearly 100 e-trucks on the road. We're currently building and testing pre-series Freightliner (eM2 and eCascadia) models, and there are a number of Fuso (eCanter) vehicles already on the road. Series production of the eCascadia and eM2 begins in 2021. We also are offering preorders of Jouley, our electric school bus, from Thomas Built Buses. That model begins series production next year.

EP: What types of electric vehicles are you using?

KOCHER: We have the class 8 eCascadia, the Class 6/7 eM2, the Jouley Type C electric school bus, and the class 4/5 Fuso eCanter [a light/medium truck].

EP: What type of vehicles are you investigating for future deployment?

KOCHER: In the case of the Freightliner models mentioned, we're just 18 months from our initial ideation of the program to now having trucks with our customers, who are using them for real-world work and to provide feedback for our final production versions. This is unprecedented development speed for the industry and where we're focused. You'll have to stay tuned for any further announcements.

We anticipate initial use cases will be shorter routes, pickup and delivery, last mile, and drayage. The school bus I mentioned, Jouley, is an ideal use case for the present, as buses run dedicated loops and return to central depots every day. As batteries and systems improve, as a high-capacity vehicle charging standard is identified, and as a charging network is rolled out, we'll see longer and heavier applications come into play.

EP: What are some of the challenges you've encountered thus far? What are some of the lessons learned?

KOCHER: The desire of so many customers to try out this technology has been a challenge. Simply put, we have more customer interest than we currently have trucks. Infrastructure is also a challenge, as charging is heavily dependent on the serving electric company and the municipality, is completely specialized to the location, and can be quite expensive if not planned out carefully.

EP: What are some of the future challenges you foresee as you electrify your fleet vehicles?

KOCHER: We can build trucks faster than we can install infrastructure, and, in many cases, we can build infrastructure faster than electric companies can add capacity. We'll have to work closely with electric companies to ensure a smooth rollout of infrastructure to support our



Daimler Trucks North America plans to begin series production of its eCascadia electric truck in 2021.

common customers. Early planning and collaboration are key.

EP: How can electric companies support your company as you move toward fleet electrification?

KOCHER: We've already built close working relationships with electric companies in areas where our first customers will be running electric trucks. We will continue to nurture those relationships, so we can work together and best serve our common customers. For electric companies that want to prepare for truck electrification, we would ask them to have dedicated transportation electrification teams and have specialized rate programs and make-ready programs to provide customers a business-case positive experience as they transition to electric trucks. All electric companies can also perform a survey of fleet locations in their service area and plan out the grid improvements needed to support electrification of those trucks. We have already reached out thru EEI and other organizations to spread this message. EP

DTE Job Training Program Offers Prisoners a Second Chance

TE Energy, through a unique initiative, is offering a second chance to a group of prisoners preparing to reintegrate into society, while developing a trained and dedicated workforce to fulfill a critical need in Michigan.

A group of 24 prisoners eligible for parole will spend the next six to nine months in the program, training for careers in tree trimming. Each graduate will learn safety procedures, practice proper use of tree trimming equipment, and obtain a commercial driver's license.

"I've learned from my peers both in Michigan and in other states—that returning citizens who are looking for a second chance in life can be among your very best and most loyal employees. They just need to be given a chance," said Gerry Anderson, EEI vice chairman and DTE executive chairman.

The company depends on a workforce of 1,300 skilled tree trimmers to keep vegetation away from power lines, but Michigan faces a critical shortage of qualified people to fill tree-trimming positions. Graduates of the program, once released on parole, will be eligible to join International Brotherhood of Electrical Workers Local 17, which will help place them with a local tree trimming contractor.

Dean Bradley, business manager and executive secretary with Local 17, explained, "There's a shortage of tree trimmers because of the nature of the job." When meeting with students of the program, he said, "I see the drive and determination in their eyes as



Gerry Anderson, EEI vice chairman and DTE executive chairman, shakes hands with Jeffrey Gunnells, a member of the program's first class of students, as Heidi Washington, director of the Michigan Department of Corrections, looks on.

A criminal record shouldn't be a life sentence of unemployment.

I speak to them about the opportunities that are coming their way. That's exciting for us, because we really want to help them get a start in life again."

The DTE Energy Foundation provided an initial grant of

\$100,000 to help launch the program and purchase training equipment, and worked with Local 17 to design the curriculum and to install a climbing structure at the Michigan Department of Corrections' (MDOC's) Vocational Village at Parnall Correctional Facility.

Prior Vocational Village programs have been highly successful—MDOC Director Heidi Washington notes that 95 percent of participants of programs in Jackson and Ionia begin jobs immediately after leaving prison. Graduates have a recidivism rate of just 2 percent, compared to the



DTE installed a 45-foot-tall climbing structure at MDOC's Vocational Village at Parnall Correctional Facility for instructors and students to use.

state's overall rate of 29 percent, according to MDOC.

"We have an opportunity here to make Michigan an example for the country and set a nationwide standard for criminal justice reform," said Michigan Governor Gretchen Whitmer at a press conference to launch the program. "I'm proud to partner with DTE Energy as we take a new approach to preparing inmates for successful lives after incarceration by creating the nation's first vocational tree trim program. This skilled trades program will improve outcomes of the folks going through our criminal justice system, save taxpayer dollars on recidivism, and make our communities safer."

Inmate Jeffrey Gunnells, a member of the program's first class, told reporters, "It's reassurance. It's comforting knowing that people are willing to trust me. I've not always been a trustworthy person. I've been saddled with the guilt, remorseful for what I did. And to have somebody that's willing to invest in my future is a beautiful thing."

"We sit idle a lot in prison," he added. "To be able to put our hands on tools, and work, and to feel like, maybe, a classmate instead of an inmate, is big for us." "There's nothing in the world that exists like this," said James Son, an instructor with the program. "Not in prison, or out of prison, where you can go and get this kind of in-depth training day in and day out. We're on the cusp of something huge here."

Added Anderson, "For DTE, we as a company can be part of affording them a second chance. They have to learn the skills. They have to have the discipline. But we should give them that second chance. A criminal record shouldn't be a life sentence of unemployment." EP

Sharing Our Story with Regulators

By PHILIP D. MOELLER

grew up in eastern Washington not far from the Columbia River, one of the longest and deepest rivers in the country. Whoever coined the phrase that "still waters run deep" could very well have used that river as inspiration. Or, they could have been referring to the electric power industry.

I've had a long career working in the industry, which includes about 10 years as a commissioner at the Federal Energy Regulatory Commission (FERC). Yet, when I joined EEI several years ago, I soon realized the breadth and depth of activities that EEI and its member companies engage with runs far deeper than what's visible on the surface.

In hindsight, this isn't too surprising since, as an industry, we tend to focus on the task at hand and quickly move on to accomplish the next item on the never-ending agenda to deliver affordable, reliable, clean, and more secure energy. However, we can't expect anyone, even those in our closest orbit, such as regulators, to fully appreciate the value we collectively provide to customers unless we are more intentional about sharing that information.

With that thought in mind, here are several value-added contributions that EEI provides to member companies in the U.S., and in support of the electric power industry around the world, that you may not be aware of.

EEI has a team that coordinates storm and emergency response activities with our member companies, Regional Mutual

I ve had a long career working in the industry, which includes about 10 years as a commissioner at the Federal **Energy Regulatory** Commission (FERC). Yet, when I joined EEI several years ago, I soon realized the breadth and depth of activities that EEI and its member companies engage with runs far deeper than what's visible on the surface.

Assistance Groups, and government partners to ensure unity of effort and message. Following Superstorm Sandy, this team also helped develop the National Response Event framework to ensure member companies are working seamlessly during extraordinary events. They also coordinate the activities of the Spare Transformer Equipment Program, and SpareConnect for other transmission assets. And, they serve as the secretariat supporting the Electricity Subsector Coordinating Council (ESCC), a joint effort of senior industry and government leaders that helps prepare for, and respond to, threats to the energy grid.

Given the nature of our membership, EEI conducts extensive outreach to the financial community, executes our Financial Conference, and publishes a wealth of financial documentation of our industry. In recent years, our team has developed an environmental, social, governance, and sustainability (ESG/sustainability) reporting template to help member companies provide the financial sector with more uniform and consistent information on their approach to ESG and sustainability.

EEI also has launched the Natural Gas Sustainability Initiative, a project intended to ensure that our customers can benefit from the continued use of natural gas in the most environmentally sustainable way.

EEI's members are leading a clean energy transition, and we are working with companies to highlight this transition and the key role the industry can play in helping the nation meet its climate and clean energy goals. In addition, EEI recently has taken the lead in developing a wildfire practice, emphasizing partnerships between EEI member companies and federal and state agencies with the intent of developing procedures to better detect, prevent, and minimize the impact of wildfires on our customers.

On the regulatory front, EEI continues to work extensively on matters before FERC, and we have greatly expanded regulatory efforts at the state level.

EEI's cross functional state engagement practice, which includes EEI staff from regulatory, external affairs, and communications, focuses on emerging policies related to energy storage, microgrids, electric vehicle charging stations, smart communities, data, and more. EEI's member companies are leaders in developing and deploying innovative energy solutions that our

EEI's members are leading a clean energy transition, and we are working with companies to highlight this transition and the key role the industry can play in helping the nation meet its climate and clean energy goals. customers want and expect, and this team, along with our customer solutions team, focuses on aligning state policies so those innovations may flourish.

Our society is increasingly global, and EEI works on initiatives through our International Programs to facilitate electrification of areas in the world that still need it and to discern rapidly evolving worldwide trends—both regulatory and technological-that can impact domestic energy policy and, consequently, customers. In addition, the team convenes dialogues for U.S. and international electric companies and other stakeholders to exchange lessons learned based on best, as well as worst, practices about complex interrelated issues facing the industry.

These activities are but a few of the ways EEI provides value to members that directly benefits their customers. We also run safety and scam awareness initiatives, training and testing programs to help find and develop qualified employees, and workforce development programs to support a diverse and inclusive workforce. And there's more, much more.

If regulators are unaware of the wide range of EEI activities, like I was, they are less likely to appreciate the benefits that EEI delivers to our member companies and their customers. That's why I was thrilled to share our story to regulators at the recent summer meeting of the National Association of Regulatory Utility Commissioners in Indianapolis. In two widely attended dialogues, we showed a running loop of images that put a visual context to the wide array of EEI's activities. It's something we'll be doing more of in the future, too.

If regulators are unaware of the wide range of EEI activities, like I was, they are less likely to appreciate the benefits that EEI delivers to our member companies and their customers.

Electric companies embrace an ethic of getting the job done, often out of the sight and minds of our customers. But it's crucial that we find new and innovative ways to be in the sight and minds of the regulators who make the decisions that impact our business. EP



PHILIP D. MOELLER is executive vice president, business operations group and regulatory affairs at the Edison Electric Institute.

Southern Company Launches New Energy Storage Research Center

lectric companies continuously invest in and commit to innovation and technological advancements. In July, Southern Company announced the launch of the Energy Storage Research Center, a unique research and development (R&D) facility focused on the development and deployment of energy storage.

The new facility is a resource for the industry to test and develop energy storage technologies needed to better integrate renewables into the energy grid, as well as improve reliability, resiliency, and affordability for customers.

"As an R&D leader, Southern Company continues to advance technologies that can help us better meet customers' needs in the rapidly evolving energy landscape," said Southern Company R&D Director Roxann Walsh during a ribbon-cutting ceremony. "The Energy Storage Research Center will broaden our work with stakeholders and technology developers to better understand energy storage systems and how to fully use this technology to build the future of energy."

The facility also will evaluate a flow battery system developed by Avalon Battery. Flow batteries, which are a type of chemical energy storage technology, can offer a longer life cycle and a quicker response time.

"We will need newer, better, more cost-effective energy storage in a low-carbon future—and R&D efforts like the Energy Storage Research Center will help bring these cutting-edge technologies to full deployment," said Walsh.



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The Energy Storage Research Center is one of several residential-, commercial-, industrial-, and large-scale battery storage R&D projects across the Southern Company system's southeastern service territory. Located on the engineering campus of Southern Research in Birmingham, Alabama, the facility is a collaboration among Southern Company, Alabama Power, Southern Research, the Electric Power Research Institute, the U.S. Department of Energy, Oak Ridge National Laboratory, and the state of Alabama.

Energy storage offers multiple benefits for the energy grid and for electricity customers. It facilitates the integration of renewable energy resources, such as wind and solar, into the energy grid by keeping supply and demand balanced at all times. Energy storage also helps to improve electric reliability by providing grid stability services, reducing transmission constraints, and meeting peak demand. Today, electric companies own, procure, or utilize 98 percent of all energy storage in the United States. Southern Compan

The facility's opening comes as Southern Company celebrates the 50th anniversary of the founding of its research and development organization. "Our commitment to R&D has never wavered," said Tom Fanning, chairman, president, and CEO of Southern Company. "These efforts continue to attract and leverage academia and outside technology expertise, solve problems for Southern Company and the entire industry, stimulate critical thinking, and embrace ideas that drive change-empowering us to better serve our customers today and into the future." EP

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