

**Strong Workforce Program
Energy, Construction, and Utilities
High Voltage Electrical Careers
Regional Workforce Advisory Meeting Proceedings
April 15, 2025
Hybrid**

Introduction

The Los Rios Community College District, in partnership with Valley Vision and in collaboration with Sierra College, Yuba Community College District, and Lake Tahoe Community College, invests in Strong Workforce funding to organize and convene Regional Advisories. The objectives of the Regional Advisories are to build strong relationships between employers, educators, and the workforce that:

- Provide timely information on skills gaps and workforce needs, informing partners on major industry trend information
- Improve the efficiency of the advisory process for educators and employers
- Reflect a regional view of workforce needs and assets
- Provide opportunities for more systemic, ongoing engagement, including workforce partners in key industry sectors

Regional Advisory meetings provide crucial insights for guiding investments and improvements in Career Education (CE) programs to meet the rising demand for middle-skill positions. This report summarizes the Spring 2025 Regional Advisory meeting, which focused on careers in the Energy, Construction, and Utilities sector, emphasizing the impact of High Voltage Electrical Careers. It includes key findings, best practices, and detailed minutes from the discussions.

Valley Vision supports a robust talent pipeline through our multiple 21st Century Workforce initiatives. We prepare our regional workforce for the future by addressing skills gaps, advancing research, aligning efforts, and strengthening systems. Valley Vision's workforce efforts are supported by the Sacramento Employment and Training Agency (SETA), Golden Sierra Workforce Development Board (WDB), North Central Counties Consortium, Yolo WDB, Los Rios Community College District, and others.

The Strong Workforce program provides Career Education opportunities to increase social mobility and fuel regional economies with skilled workers.

Key Findings

- At the Sacramento Electrical Training Center (IBEW Local 340), apprentices begin working on job sites while participating in a five-year program, earning progressively higher wages; they receive free schooling, a \$400 tool set, and can graduate to earn over \$100,000 annually. SMUD offers competitive compensation, with high-voltage electrician apprentices starting at \$44.70 per hour and journeymen reaching \$68.26 per hour, while lineworkers can earn around \$79–\$80 per hour, totaling over \$160,000 per year with overtime.
- Employers are hiring for both Middle-skilled occupations and bachelor’s degree levels. Although many entry-level technician positions require only a high school diploma, a valid driver’s license, and basic algebra skills, engineering and advanced troubleshooting roles progressively require four-year degrees. Generally, organizations favor candidates with 2 to 6 years of hands-on experience in electrical systems or EV hardware.
- Technical competencies in the energy sector now require knowledge in high-voltage safety, transformer diagnostics, software skills for SCADA (Supervisory Control and Data Acquisition) interfaces, and adaptability to emerging technologies like battery storage and grid cybersecurity, emphasizing the need for cross-disciplinary training in automotive, electrical, IT, and climate fields.
- A “cradle-to-career” continuum is essential. High-school STEM courses should integrate circuit theory and hands-on tool usage, complemented by job-shadowing at substations or charging depots. Post-secondary stackable credentials, from helper certificates to advanced technician diplomas, can ladder into paid apprenticeships. Rivian’s mobile training labs and SMUD’s targeted outreach days serve as scalable models for extending immersive learning into underserved communities.
- The Sacramento Electrical Training Center’s union program enrolls 450 apprentices on average, advancing through modules on transformers, motor controls, and solar integration. Meanwhile, Rivian’s cohort-based academies combine classroom theory with rotations through service centers, accelerating readiness for work on live electric vehicle (EV) systems. Despite these strong pathways, credential completion remains a bottleneck, with only about 121 high-voltage–related awards conferred annually by community colleges.
- Enhanced collaboration among Centers of Excellence, training centers and programs, and industry leaders will boost capacity and align educational programs with market demands, including stackable certificates that support access to apprenticeships and degrees, clearer identification of sub-baccalaureate jobs in the high voltage sector, and stronger partnerships for flexible, safety-focused training as California modernizes its energy infrastructure and electric vehicle grid.
- There is a significant opportunity in the evolving nature of technical education, particularly through the incorporation of augmented and mixed reality, to enable "hands-on" training in sectors that may not have the financial resources for large-scale equipment purchases. This innovative approach can bridge gaps in training accessibility and enhance learning experiences for students in various technological fields.

Meeting Proceedings

Welcome and Introduction

Valley Vision Project Coordinator Liz Kilkenny opened the event by greeting participants at the High-Voltage Workforce Advisory Panel. She outlined Valley Vision’s mission as a civic leadership organization dedicated to uniting community, industry, and education partners to address our region’s most pressing workforce issues and to promote a sustainable economic future.

Following that, Caitlin Blockus, Project Manager at Valley Vision, acknowledged the key members of the planning team responsible for the day's program: Julie Muir, Director of Employer Partnerships for Advanced Manufacturing at Los Rios Community College District, and April A. Vera, Director of Employer Partnerships for Energy, Construction, and Utilities at Los Rios Community College District, and Dr. Amy Schulz, Executive Dean of Workforce & Strategic Initiatives at Sierra College. Amy Schulz expressed her appreciation to everyone for their involvement and emphasized the crucial need for collaboration among employers, educators, and community leaders as California accelerates its transition to a clean energy economy.

Guest Speaker

Larry Rillera, Staff Air Pollution Specialist for Community Outreach and Engagement at the [California Air Resources Board](#), delivered a presentation on the state’s leadership in Zero-Emission vehicle (ZEV) technologies and the integrated strategy driving workforce development in the clean transportation sector. His remarks provided a comprehensive overview of how California is advancing its climate goals while creating meaningful economic opportunities through education, innovation, and infrastructure investment.

Rillera outlined California’s ZEV Market Development Strategy, which is built around four key pillars: vehicles, infrastructure, users, and workforce (Figure 1.1). With over 60 ZEV-related manufacturers, electric transportation has become the state's top export, according to Rillera, indicating the sector's rapid growth and global



Figure 1.1 ZEV Market Development

significance. He emphasized California's broader ambition of achieving zero-carbon energy generation by 2030, with the electrification of transportation playing a central role.

The presentation underlined the importance of aligning education and workforce training with emerging technologies. Rillera discussed strategic investments in clean mobility workforce development that span middle schools, high schools, community colleges, and technical training centers. Notable examples included [Mulholland Middle School](#) in Los Angeles, California, where students design and construct a 1/10th-scale, remote-controlled, hydrogen fuel cell-powered car. A [Calexico High School ZEV Automotive Program](#) successfully electrified a classic Volkswagen Beetle, and [partnerships with institutions like Fresno City College](#) support hands-on training in electric vehicle technology.

In discussing the evolving nature of technical education, Rillera emphasized the use of immersive tools such as augmented and mixed reality for training on high-voltage electric systems, citing operator [AC Transit](#) as a leader in this area. He noted that traditional classroom methods are being modernized to meet the complex, multidisciplinary demands of ZEV technologies, requiring upgrades to facilities and innovations in the curriculum.

A key theme of Rillera's presentation was the growing demand for skilled workers who possess both technical expertise and environmental literacy. He stressed the need for cross-disciplinary skills, as job roles in the clean transportation sector increasingly require knowledge that spans automotive, electrical, IT, and climate-related domains. This shift underscores the importance of flexible, adaptive training programs that can evolve with technology.

Equity was another central focus of Rillera's discussion. He emphasized the necessity of including all communities, particularly those historically underserved, in the state's clean energy transition. By prioritizing access to educational programs and workforce pathways, California aims to ensure that the economic benefits of its ZEV strategy are widely shared.

Looking ahead, Rillera projected exponential job growth in the ZEV and infrastructure sectors. His presentation reinforced California's role as a national leader in zero-emission technologies and showcased a forward-thinking approach to workforce development, one that not only supports the state's environmental goals but also lays the foundation for a more inclusive and sustainable economy.

Labor Market Information and Job Posting Insights

Ebony Benzing, Director of the North/Far North Center of Excellence for Labor Market Research, provided a detailed labor market assessment focused on high-voltage occupations—those involving electrical systems operating above 600 volts, as defined by Cal/OSHA and the National Fire Protection Association. Benzing clarified that “high voltage” should be understood as a specialized skill set rather than a single occupation. This distinction informed her team's

methodology, which involved using keyword and skills-based searches to capture relevant job postings across a wide range of titles and education levels.

Over the past year, Benzing's analysis identified 416 job postings seeking high-voltage competencies, revealing a clear dual-track labor market. Approximately 131 positions required sub-baccalaureate credentials, such as a high school diploma or an associate degree, while 108 postings specified a bachelor's degree, as shown in Figure 1.2. This division reveals the accessibility of entry-level roles for technicians and electricians alongside more advanced engineering opportunities, indicating the opportunity to accommodate learners at different starting points.

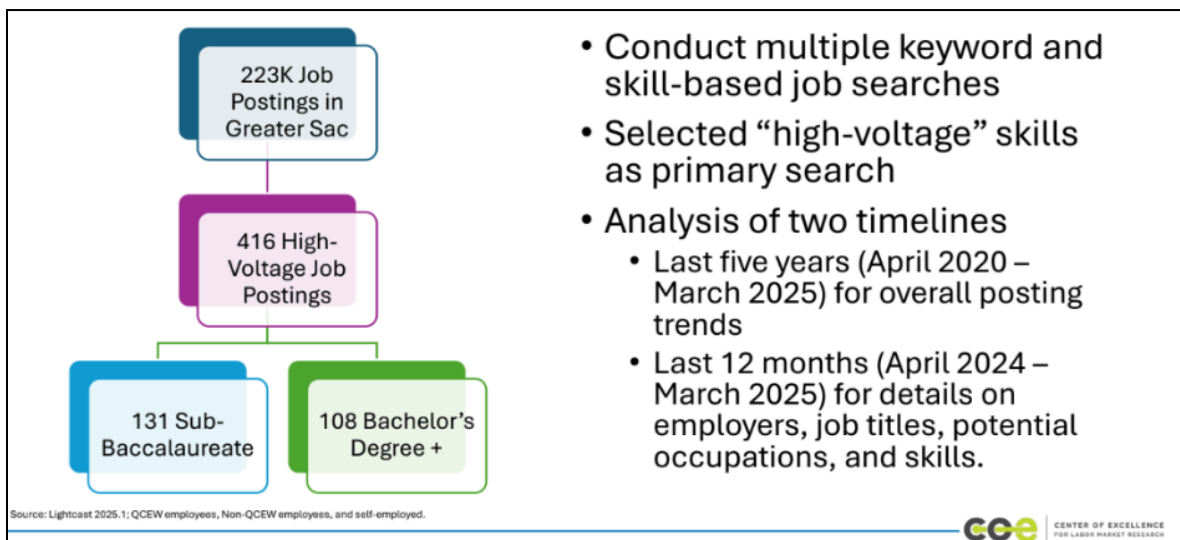


Figure 1.2 High-Voltage Job Postings Analysis

Hiring for high voltage roles spans a diverse set of industries, with the highest concentrations in professional, scientific, and technical services; manufacturing; utilities; construction; and public administration. Benzing named SMUD, California ISO, PG&E, Sargon, and Telesolutions as leading employers in this field (Figure 1.3). Within these industries, job titles varied from frontline electricians and installation technicians to electrical engineers and maintenance specialists, reflecting the multifaceted nature of high voltage work, ranging from hands-on system repair to complex design tasks.

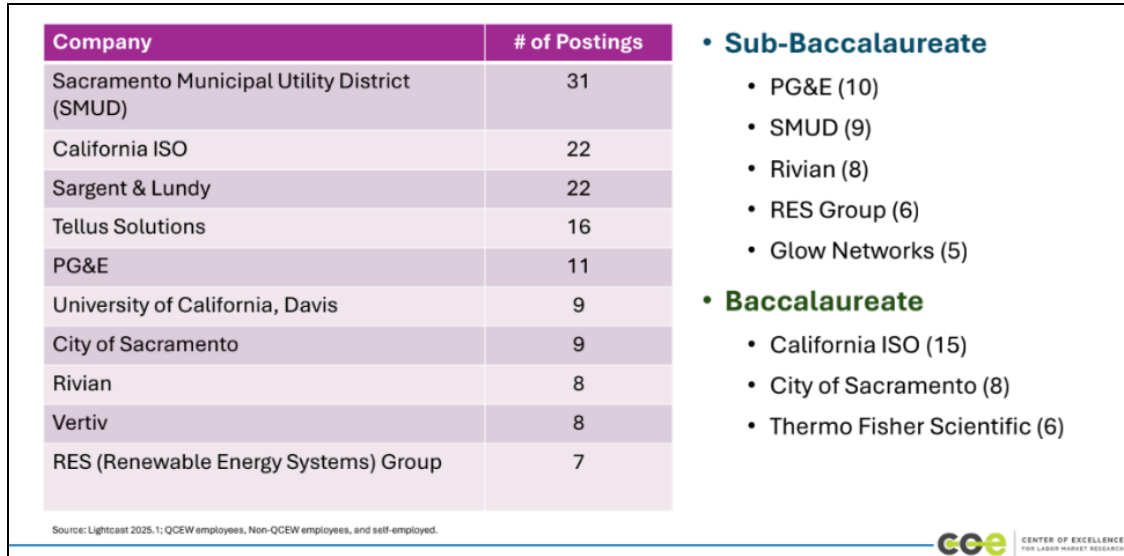


Figure 1.3 Employers with the Most Postings

Regarding employer expectations, Benzing noted a distinct divide based on educational attainment. Middle-skilled occupations prioritize practical, hands-on skills, such as maintenance and repair, as well as roles like Electricians and Power Line Installers. At the same time, bachelor's-level positions require deeper expertise in Electrical Engineering, Electronics engineering, and project management (Figure 1.4). Most employers preferred candidates with 2-6 years of experience, showcasing the value of on-the-job learning and the need for real-world training opportunities.

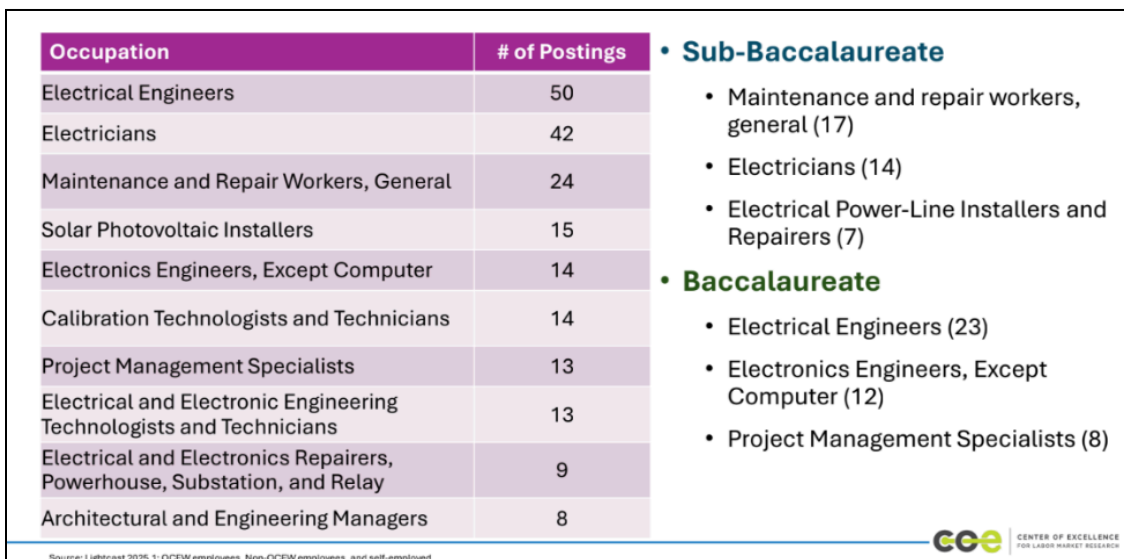


Figure 1.4 Occupations with the Most Postings

Despite the strong demand, Benzing pointed out a significant gap in formal training programs dedicated specifically to high voltage. Community colleges across the state award only about 121 credentials annually in related fields, leading many workers to seek specialized skills from

third-party online providers (Figure 1.5). Additionally, her five-year trend analysis revealed that high-voltage job postings sharply declined during the COVID-19 pandemic but have since rebounded to pre-pandemic levels, indicating a resilient and growing—need for qualified talent.

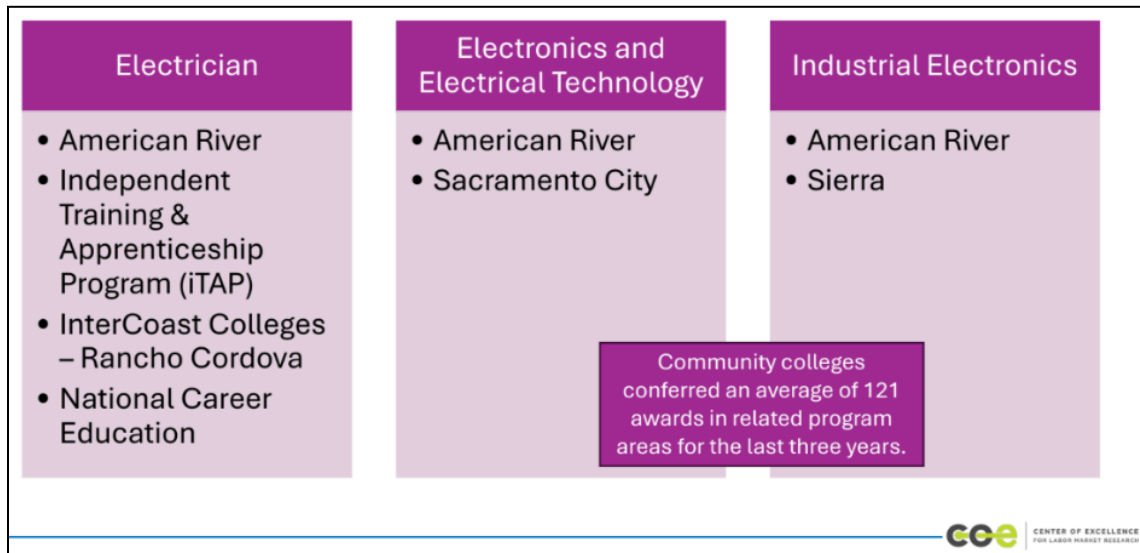


Figure 1.5 Existing Regional Training Programs

To better understand the diverse competencies required, Benzing categorized skills into three main groups as shown in Figure 1.6: Specialized Skills (task-specific technical abilities), Common Skills (soft skills like problem-solving and teamwork), and Software Skills (familiarity with diagnostic and design tools). However, she cautioned that there are significant variations in how employers define “high voltage” work, ranging from basic awareness to direct, hands-on system engagement, creating challenges for both data analysis and curriculum design.

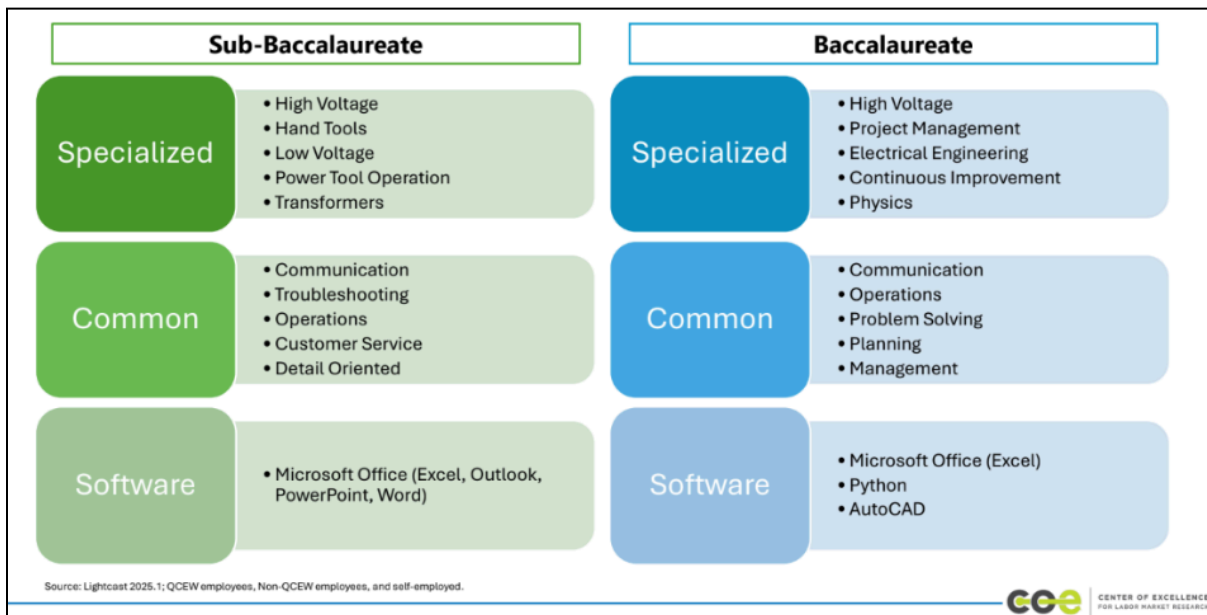


Figure 1.6 Most Desired Skills

In response to these findings, Benzing recommended conducting a more comprehensive labor market assessment alongside an employer survey to pinpoint specific training needs. She advocated for clearer identification of middle skill occupations within the high voltage sector and for stronger partnerships between industry and academia to adapt alongside evolving technology and regulatory standards.

Benzing emphasized that as California continues to modernize its energy infrastructure and expand its electric vehicle grid, building a well-trained and adaptable workforce with high-voltage competencies will be essential. By aligning education programs with employer-defined skills and fostering ongoing collaboration between academia and industry, the state can ensure both the safety of its electrical infrastructure and economic opportunities for its workforce in this critical, high-growth field.

Panel Discussion

During the panel discussion, regional and national employers—including SMUD, Cal EPIC (formerly the California Mobility Center), Rivian, and the Sacramento Electrical Training Center—shared their perspectives on the talent needs for the high-voltage workforce. Representatives from both large utilities and innovative EV manufacturers communicated the growing need for technicians and engineers skilled in systems above 600 volts, reflecting a broad hiring strategy that spans grid modernization, zero-emission vehicle infrastructure, and renewable integration.

The panel included:

- Christy Dray, Sacramento Municipal Utility District (SMUD), Manager, Substation Construction & Maintenance, Grid Assets
- Orville Thomas, Cal EPIC, Chief Executive Officer
- Tom Clarke, Rivian, Lead Learning & Development Program Manager
- Chris Tillery, Sacramento Electrical Training Center (IBEW Local 340), Training Director

Caitlin Blockus, 21st Century Workforce Project Manager at Valley Vision, moderated the panel.

Recruitment and Hiring Strategies

California's rapid expansion of zero-emission vehicle infrastructure and grid modernization projects has driven unprecedented demand for high-voltage talent. Employers across the energy and transportation sectors are adopting distinct yet complementary strategies to meet this demand.

SMUD employs a rigorous two-stage evaluation process for high-voltage electrician candidates. Applicants must first pass a written exam covering electrical theory, safety protocols, and relevant codes (such as Cal/OSHA and NFPA standards), followed by a practical hands-on simulation. In this timed exercise, candidates troubleshoot a high-voltage mock substation while

wearing full protective gear, ensuring not only technical knowledge but also a high degree of safety and situational awareness.

Rivian, a fast-growing electric vehicle manufacturer, is building out its workforce through an internal training pipeline designed to meet its ambitious scaling goals. The company expects to grow from 2,400 to 12,000 employees within five years and has developed cohort-based “technician academies” to prepare new hires for roles in EV servicing and infrastructure maintenance. These academies combine classroom instruction in power electronics, battery diagnostics, and high-voltage safety with hands-on learning at service centers and mobile labs. Rivian also promotes a mobile service technician model, which allows employees to troubleshoot and repair EV systems in the field, expanding workforce flexibility while ensuring customer needs are met.

At the Sacramento Electrical Training Center (IBEW Local 340), apprentices begin working immediately on job sites while progressing through a structured five-year training program. According to Tillery, apprentices earn progressively higher wages as they advance, with the program offering free schooling, a \$400 tool set on day one, and a clear path to journey-level wages. Graduates can earn over \$100,000 annually working 40 hours a week, not including overtime.

SMUD’s compensation model is equally competitive. High-voltage electrician apprentices start at \$44.70 per hour, with journeyman-level wages reaching \$68.26 per hour. Lineworkers can earn around \$79–\$80 per hour, translating to well over \$160,000 per year with standard overtime.

Despite these attractive wages and benefits, panelists acknowledged the challenges in finding qualified applicants who meet the baseline criteria—typically a high school diploma, a valid driver’s license, and basic algebra skills. In an increasingly competitive labor market, these roles offer significant opportunities but require intentional recruitment and strong foundational training to prepare new workers for the demands of high-voltage environments.

Training, Career Pathways, and Educational Collaborations

To bridge the gap between supply and demand, the panel called for a cradle-to-career continuum that begins in high school and extends through post-secondary education and employer-sponsored programs. High-school curricula should introduce foundational electrical concepts, such as circuit analysis, print reading, and safe tool handling, alongside soft-skill modules in teamwork, communication, and work ethic. Embedding job-shadowing days at local substations and EV charging sites can spark early interest, while mentorship from working electricians helps demystify career prospects.

At the community college level, stronger partnerships between Centers of Excellence, technical centers, and industry leaders could expand capacity and better align programs with real-world needs. Stackable certificates, ranging from entry-level electrical helper to advanced

power-electronics technician, should lead to paid apprenticeships or associate degrees. This approach addresses the current bottleneck. Rivian's mobile classroom initiative and SMUD's Women in Skilled Trades Day serve as models for bringing training directly to underserved areas and underrepresented groups, diversifying the talent pool, and ensuring the development of both technical and soft skills.

Workplace Culture, Support, and Retention

Once hired and trained, high-voltage professionals need strong support systems to maintain their engagement and foster career advancement. Panelists emphasized the importance of employee resource groups, such as SMUD's committees for women in trades, veterans, and minority groups, as well as Rivian's mentorship fellowships, in building a sense of community and facilitating peer learning. These affinity groups organize networking events, skill-share workshops, and career panels that enhance retention and create pathways to supervisory and engineering roles.

Continuous learning is encouraged through lunch-and-learn seminars, online micro-credentials, and sponsored industry certifications in areas like grid cybersecurity and renewable integration. Career ladders extend into specialized engineering, project management, or operational leadership positions that increasingly combine high-voltage expertise with data analytics and control system proficiency. Comprehensive benefits packages, tuition reimbursement, and clear progression frameworks further strengthen these retention efforts.

Emerging Trends and Future Outlook

Looking ahead, high-voltage roles will evolve alongside technological advancements and shifting market dynamics. The rise of virtual power plants, networks of distributed energy resources managed through advanced software, will require technicians skilled in both hardware maintenance and cloud-based monitoring. Vehicle-to-grid integration will convert parked EV fleets into mobile grid assets, introducing new safety protocols and considerations. Meanwhile, ongoing developments in battery chemistry and power-electronics efficiency will create demand for specialists knowledgeable in thermal management, inverter design, and scalable energy storage systems.

To keep pace, curricula and credentialing must adopt agile development processes that incorporate the latest industry feedback and research on grid resilience, cybersecurity, and sustainability. A sector-partnership model, uniting utilities, original equipment manufacturers (OEMs), labor unions, educational institutions, and workforce agencies, will be essential for co-governing program design, sharing resources such as mobile labs, and aligning on standardized competencies. By fostering this collaborative ecosystem, California can not only fill today's high-voltage vacancies but also future-proof its workforce to power a dynamic, clean-energy economy for decades to come.

Conclusion

At the conclusion of the advisory, faculty and employers were encouraged to continue fostering collaboration to strengthen the pipeline into careers within the region's High Voltage Electrical industry and ensure graduates are well-prepared to enter the workforce.

[Please click here](#) to view the detailed event materials and access a video recording. You can also access comprehensive labor market data on the High Voltage Electrical sectors compiled by the Center of Excellence for the Greater Sacramento region [here](#). Additionally, if you're interested in staying updated on the latest news, insights, and opportunities in workforce development, you can [sign up for Valley Vision's newsletter here](#). For more information about the report and labor market data provided, please contact:

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