



**ECONOMIC &  
WORKFORCE  
DEVELOPMENT**  
*through the*  
CALIFORNIA  
COMMUNITY  
COLLEGES

**BUSINESS AND WORKFORCE  
PERFORMANCE IMPROVEMENT INITIATIVE**



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**Strategic Possibility Report  
Sacramento, Placer, El Dorado, and Yolo Counties**

**Line Installers and Repairers  
At-A-Glance**



**Center of Excellence, Northern California Region**

**Los Rios Community College District**

**April 2007**



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# **Strategic Possibility Summary for Community Colleges In The Greater Sacramento Region**

## **Line Installers and Repairers**

**April 2007**

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The Business and Workforce Performance Improvement Initiative is a grant-funded Project through the Economic & Workforce Development Network of the California Community Colleges. Our mission is to strengthen California's workforce and advance economic growth through education, training and job development.

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**WITH EARNINGS ABOVE THE REGIONAL AVERAGE AND A HIGH PROJECTED GROWTH AND REPLACEMENT RATE OF ALMOST 60%, THE INSTALLERS AND REPAIRERS OCCUPATION REPRESENTS A STRATEGIC POSSIBILITY FOR COMMUNITY COLLEGES IN THE GREATER SACRAMENTO AREA.**

## **Introduction**

The purpose of a Strategic Possibility Report is to determine if the workforce needs of a particular industry or occupation warrant an organized response from local community colleges. Five main criteria are used to establish the value of a Strategic Possibility including: size, relevance, economic impact, high growth, and leveraging.

The Line Installers & Repairers occupation, the focus of this study, intersects two industries – electric power and telecommunications. As detailed in this report, there is a growing shortage of qualified workers in this occupation due to high occupational growth and replacement projections.

## **Occupation Overview**

While the size of the occupation is relatively small, the ten year projected growth rate of 32% exceeds the statewide average occupational growth rate by seven percentage points. Further, because of the region's aging workforce, replacement needs are projected to be between 26.6% and 32.8% during the 2002 – 2012 period. Given the growth and replacement projections, 56 job openings will need to be filled annually in the electric power and telecommunications industries.

A recent survey by the Sacramento Employment & Training Agency (SETA) revealed that three organizations employ about 75 percent of the Line Installers and Repairers in the electric power industry and two organizations employ 32 percent in the telecommunications industry. Most of these employers reported difficulty in finding experienced applicants and expressed a willingness to accept vocational training as a substitute to prior experience.

In the electric power industry, new hires with no experience earn an average annual salary of \$54,920 and after just three years of experience can earn \$85,115 annually. Entry level Line Installers and Repairers in the telecommunications industry earn somewhat less at \$31,185, but after three years of experience can easily earn \$47,755. It is also important to note that with three or more years of experience, the average salary of Line Installers and Repairers in both sectors significantly exceeds the regional average of \$36,866 (SETA Occupational Outlook Survey, 2006).

## **Occupation Training Needs and Challenges**

The specialized knowledge of Line Installers and Repairers differs slightly depending on the industry. In the electric power industry, Line Installers and Repairers work with electric power distribution systems, substations and transformers while the telecommunication industry (internet, telephone and cable) work more with fiber optics

and telecommunication routers and switches. Although knowledge requirements differ, the work performed is comparable.

Both kinds of line workers establish new lines by constructing utility poles, towers and underground trenches and running cable along poles or through tunnels and trenches with the end goal of providing service to customers. Equipment utilized to complete the work typically includes trucks with augers and cranes, cable plows and borers. Repair work typically involves maintenance or repair of malfunctioning cables, which requires splicing wires together with the use of small hand tools. In the telecommunication industry, the demand for high speed connections is driving the replacement of conventional wire or metal cables with fiber optic cables. Thus, a specialized knowledge of fiber optics is desirable in this field.

In general, the following basic qualifications, skills and competencies are required of Line Installers and Repairers:

- High school diploma
- Driver's licenses and clean record with the DMV
- No prior felonies or DUI(s)
- Not afraid of heights
- Physical strength and stamina
- Ability to distinguish between colors
- Customer service / interpersonal skills
- Mechanical ability and some knowledge of applied algebra and trigonometry
- Technology knowledge of electricity or electronics, preferred

While post secondary education is not required, several Line Installers and Repairers certificate and two year degree programs have been developed in partnership with California community colleges and local employers. These programs give graduates preferential treatment in the hiring process and assist employers with screening, ultimately reducing costs associated with recruitment and training. See Appendix C for a list of the Line Installers and Repairers certificate and degree training programs in California. As of today, there aren't any related programs offered in the Sacramento area.

## **Career Pathways**

Line Installers and Repairers typically progress from entry level jobs involving tasks such as ground maintenance to advanced positions involving activities such as stringing cable and electrical repair work. Most of the large employers provide in-house apprenticeship programs that provide the necessary training to advance.

In addition to product knowledge and technical competence, Line Installers and Repairers with excellent customer service skills, ability to work in a team, and supervisory skills are more likely to advance to higher levels of responsibility and pay than their counterparts with limited interpersonal skills.

## **Conclusion**

Given the limited size of this occupation, an organized response from multiple community colleges would not be appropriate. A training gap, however, does exist because of the occupation's high projected replacement and growth rates. To better meet the workforce needs of regional electric power and telecommunication employers, the community college system would benefit by investing in a Line Installers and Repairers certificate program.

Acting as a pre-apprenticeship model, a Line Installers and Repairers training program would expose potential employees to the challenges of the career, build diversity in the applicant pool, and reduce recruitment and screen expenses. In addition to benefiting local employers, the college system would also benefit by developing a program that provides students a competitive advantage in the hiring process and entry into a well paying career.

For detailed data and analysis of industry and occupational projections, average earnings, and the relevance and leveraging capabilities refer to Appendix B.

## References

America's CareerInfoNet, Informed Career Decisions

Bureau of Labor Statistics, Occupational Employment Statistics, 2005

Comcast Corporation <http://www.comcast.com/>

Occupational Outlook & Training Directory: Sacramento Region, 2005 – 2006

Sacramento Municipal Utility District (SMUD) <http://www.smud.org/>

SETA Occupational Outlook Survey, 2006

The Conference Board, Mature Workforce Facts, 2006

U.S. Bureau of Labor Statistics, Occupational Outlook Handbook: 2006-2007

U.S. Census Bureau, American Community Survey, 2005

U.S. Census Bureau, Local Employment Dynamics, 2001 – 2004

## APPENDIX A: How to Utilize this Report

### ***What is a Strategic Possibility***

The California Community Colleges System has charged the Economic & Workforce Development (EWD) Network to strategically identify growing industries and occupations that have partnering potential for the college's programs. The EWD network aims to best serve our local communities by identifying industry sectors with empirically validated projected growth. Additional criteria to establish the value of a Strategic Possibility includes: relevance (to the community colleges), economic impact, the adaptability of colleges to respond, and the ability to build partnerships with workforce and industry leaders to create career paths and upward mobility.

A Strategic Possibility report identifies industries and occupations that meet some, but not all, of the aforementioned criteria. While a response may be appropriate for a specific college, a strategic response from multiple districts is not warranted. A Strategic Possibility that meets all of the stated criteria, thus warranting an organized response from regional community colleges, is then defined as a Strategic Opportunity. A full environmental scan may then be conducted to evaluate and suggest possible actions to ensure market responsiveness. While this report does not present findings which suggest a need for a full environmental scan, we provide these findings for the reader's information and use.

### ***How to Use This Strategic Possibility Report***

The Centers of Excellence within the Business and Workforce Performance Improvement Initiative of the California Community College Economic and Workforce Development Program have undertaken Industry Scanning to provide targeted and valuable information to community colleges on high growth industries and occupations.

This report, while not a full industry scan, is intended to assist the decision-making process of California community college administrators and planners in addressing local and regional workforce needs and emerging job opportunities in the workplace as they relate to college programs. The information contained in this report can be used to guide program offerings, strengthen grant applications, and support other economic and workforce development efforts.

This report is designed to provide current industry data that will:

- Define potential strategic opportunities relative to an industry's emerging trends and workforce needs;
- Influence and inform local college program planning and resource development; and
- Promote a future-oriented and market responsive way of thinking among stakeholders.

This Industry Scan included a review of the California Regional Economies Project reports and Employment Development Department (EDD) Labor Market Information (LMID) projections that cover the communities in this region, as well as many other sources as listed.

### ***About Us - Description of BWPI***

The Business and Workforce Performance Improvement (BWPI) initiative is focused on building the capacity of the colleges in the area of economic and workforce development to enhance their ability to deliver education and training services to businesses and workers in high growth industries, new technologies, and other clusters of opportunities.

The Centers of Excellence (COE) within BWPI provide information regarding workforce trends, increasing awareness and visibility about the colleges economic and workforce development programs and services, and building partnerships with business and industry. The difference this will make to the colleges is that it will position them as THE workforce partners of choice to business and industry and ensure that college programs are current and responsive. This will contribute to the overall economic vitality of the communities in which they serve.

### ***Industry Validation***

In addition to the Sacramento Employment & Training Agency (SETA) Occupational Outlook Survey, several interviews were conducted with large employers in the Sacramento region. The interviews revealed that employers from both industry sectors – telecommunications & utilities – are experiencing significant recruitment challenges, spurred by industry growth and the aging workforce.

The Occupational Outlook Survey, administered by SETA, profiles occupations in the nine county Sacramento region, which includes Alpine, El Dorado, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, and Yuba counties. Each occupation profile includes an assessment of supply and demand, wages and benefits, employer requirements, employer trends, and important knowledge, skills and abilities. Employers are asked to provide workforce projections for the next two years, beginning at the time of the survey. Administered in the last quarter of 2006, nineteen employers in the Sacramento MSA responded to the Line Installers and Repairers survey.

### ***Important Disclaimer***

All representations included in this Environmental Scan product/study have been produced from a secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings. The purpose of the Environmental Scan is to assist the California Community Colleges to respond to emerging market needs for workforce performance improvement. However, neither the Business and Workforce Performance Improvement Centers of Excellence, COE host college or California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon this study including components or recommendations. This project is funded in part by the California Community Colleges Chancellor's Office, Economic and Workforce Development Program, grant number 06-305-017 for \$205,000 to fund multiple projects and activities through the Center of Excellence.

## APPENDIX B: Qualifying The Strategic Possibility Data

### Industry Growth

In the Sacramento MSA, the utilities industry, which includes electric power, has experienced significant growth with the addition of 4,905 employees from 2001 to 2004. The largest percentage of change occurred between 2002 and 2003 in which total employment grew by 71 percent as show in Table 1. The information industry, which includes broadcasting and telecommunications, experienced moderate growth from 2001 to 2004 as shown in Table 2.

Turn over in the information industry historically has been higher, averaging 8.68% in the information industry compared to 5.62% in the utilities industry. However, as reported by representatives from both sectors, the workforce is aging, which will likely result in higher separation rates.

Table 1: NAICS 22, Utilities Industry - Quarterly Workforce Indicator Averages

	2001	2002	2003	2004
Total Employment	1483	1508	5188	6388
Net Job Flows	20	20	1163	-49
Job Creation	45	35	1224	58
New Hires	86	63	1454	246
Separations	82	78	289	364
Turnover	4.20%	4.53%	10.05%	3.68%

Table 2: NAICS 51, Information Industry - Quarterly Workforce Indicator Averages

	2001	2002	2003	2004
Total Employment	16,237	16,117	15,762	17,542
Net Job Flows	12	-391	282	-172
Job Creation	997	501	870	595
New Hires	2,596	1,709	2,004	1,828
Separations	3,053	2,365	1,957	2,215
Turnover	10.94%	7.92%	7.28%	8.58%

Source: U.S. Census Bureau, Local Employment Dynamics, 2001 – 2004

### Occupation Projections

While the size of the Line Installer and Repairer occupation in the electric power sector is smaller than the telecommunications sector, the projected growth rate is similar at 31.3 and 32.8 percent, respectively. Also, it is important to note that the SETA Occupational Outlook Survey revealed a higher replacement need than EDD's projections. According to the Survey, the electric power and telecommunications sectors will need to hire 25 and 87 Line Installers and Repairers, respectively, in the next 24 months, which is about 15 percent higher than EDD's projections.

Table 3: Line Installers and Repairers in the Sacramento MSA

Code	Name	2002	2012	New Jobs	Replacement	% New	% Rep.	% New
					Jobs			and Rep.
49-9051	Electrical power-line installers and repairers	160	210	50	50	31.3	31.3	62.5
49-9052	Telecommunications line installers and repairers	640	850	210	170	32.8	26.6	59.4

Source: Employment Development Department, Labor Market Information Division

### Average Wages

Due to the inherent risks associated with this occupation, both the telecommunications and electric power industries provide competitive wages in order to attract qualified applicants. As shown below, experienced employees in both sectors can earn salaries significantly above the region's average of \$36,888 after just three years of experience.

Table 4: Electric Power Line Installers and Repairers in the Sacramento MSA

Code	Experience Level	Average Earnings	Range of Earnings
49-9051	New hires with no experience	\$54,920	\$37,814 - \$75,000
49-9051	Experienced employees after 3 years	\$85,115	\$74,755 - \$100,000

Table 5: Telecommunications Line Installers and Repairers in the Sacramento MSA

Code	Experience Level	Average Earnings	Range of Earnings
49-9052	New hires with no experience	\$31,185	\$20,800 - \$65,353
49-9052	Experienced employees after 3 years	\$47,755	\$35,360 - \$71,822

Source: SETA Occupational Outlook Survey, 2006

### Relevance

According to the SETA Occupational Outlook Survey, employers from both sectors find it very difficult to recruit experienced applicants and somewhat difficult to recruit inexperienced applicants. As described by one of the survey participants, the screening process is a time consuming task. Many of the applicants are immediately screened out due to the lack of basic requirements (refer to page 1 & 2, *Occupation Training Needs and Challenges* for a list of the basic requirements). The recruitment pool can easily begin with 400 applicants of which only 8 or less are hired.

Given the recruitment challenges of this industry, employers would greatly benefit from a training program that prepared students for entry level positions. Students would also benefit by gaining skills that would provide a competitive advantage in the hiring process. The majority of employers surveyed reported that vocational or apprenticeship training would be acceptable as a substitute for experience.

## Leveraging

Due to the projected growth of the electric power industry, several associations have developed programs to promote industry-education collaborations that address the current and projected workforce shortages. For example, the Center for Energy Workforce Development offers a variety of models and templates to ease duplication of energy training programs.

Several industry associations recognize the growing workforce needs in the utilities sector and provide a variety of resources to assist with the solution. The following websites provide additional information:

- International Brotherhood of Electrical Workers (<http://www.ibew1245.com/>)
- Energy Providers Coalition for Education (<http://www.epceonline.org/>)
- Center for Energy Workforce Development (<http://www.cewd.org/>)
- Edison Electric Institute (<http://www.eei.org/>)
- American Public Power Association (<http://www.appanet.org/>)
- Get Into Energy (<http://www.getintoenergy.com/>)

In the Sacramento region, several employers have expressed interest in forming a consortium to support the development of a Line Installers and Repairers training program with the ultimate goal of expanding and strengthening the pipeline of qualified candidates entering the system. Barriers that must be addressed include the recruitment of instructors, start up expenses and marketing to attract students to enroll in the program.

## Appendix C: Line Installers and Repairers Programs in California

<i>College / Name of Program / Website for More Information</i>	<i>Degree Units</i>	<i>Cert Units</i>	<i>Type of Degree</i>
Imperial Valley College Apprenticeship: Power Lineperson <a href="http://www.imperial.edu/catalog/Catlog06-07Web.pdf">http://www.imperial.edu/catalog/Catlog06-07Web.pdf</a>			
Los Angeles Trade-Technical Electrical Lineman Apprenticeship <a href="http://www.lattc.edu/lattc/catalog/appr.pdf">http://www.lattc.edu/lattc/catalog/appr.pdf</a>		18	
Palomar College Apprentice Electrical Lineperson <a href="http://www.palomar.edu/catalog/2006/pdf/section_4_pgs_60-107.pdf#page=23">http://www.palomar.edu/catalog/2006/pdf/section_4_pgs_60-107.pdf#page=23</a>	48	48	A
San Diego City College Electricity Lineman <a href="http://ispt.sdccd.edu/apprent/programs.htm">http://ispt.sdccd.edu/apprent/programs.htm</a>		30	S
San Diego City College Electrical Systems and Power Transmission Lineman <a href="http://ispt.sdccd.edu/apprent/programs.htm">http://ispt.sdccd.edu/apprent/programs.htm</a>	30		
Santiago Canyon College Apprenticeship: Power Lineman <a href="http://www.sccollege.edu/projects/40/Catalogs/SCC_Catalog_2006-07.pdf">http://www.sccollege.edu/projects/40/Catalogs/SCC_Catalog_2006-07.pdf</a>	24	24	B

Degree Type. "A" indicates Associate in Arts, "S" indicates Associate in Science, and "B" indicates that both an Associate in Arts and an Associate in Science are available.

Cert Units. Number of core units and restricted electives required for a certificate. Expressed as semester units for all colleges except DeAnza, Foothill, and Lake Tahoe, whose listings are in quarter units.

Degree Units. Number of core units and restricted electives required for the major, and any closely associated prerequisites, in a degree program. Excludes general education and open electives. Expressed as semester units for all colleges except DeAnza, Foothill, and Lake Tahoe, whose listings are in quarter units.

## Appendix D: Job Description Examples

### Sacramento Municipal Utilities District (SMUD)

<b>Job Title</b>	LINEMAN / LINEWOMAN w/CLASS A
<b>Job ID</b>	280
<b>Job Category</b>	Skilled/Craft/Trades
<b>Last Day to Apply</b>	12/31/2006
<b>Salary Range</b>	35.38 - 35.38
<b>Employment Type</b>	Regular
<b>Eligible List</b>	Yes
<b>Selection Process</b>	Appl. review, written/performance exams, interview
<b>Purpose</b>	An employee of this classification does skilled work in the construction, maintenance and repair of overhead or underground subtransmission and distribution electrical lines and does related work as required.
<b>Essential Functions</b>	A Lineman/Linewoman does skilled work in the construction, maintenance and repair of overhead and underground electrical lines; sets, raises and guys wood and metal poles; installs crossarms, insulators, supports and other hardware and strings wire and cable on overhead systems; helps in trenching operations, lays out, measures, cuts, installs and splices cable and grounds in underground residential and light commercial systems; installs and connects single- and three-phase transformers and transformer banks for star and delta services; installs switchgear, capacitors, condensers, voltage regulators, risers, lightning arrestors and protective devices; performs rigging for heavy installations such as vaults, transformers, and pole top substations; measures loads and determines electrical continuity; strings service wires; performs work on transmission towers and lines; works on energized lines using rubber gloves and insulating devices and uses hot-stick tools when necessary; climbs wooden poles using hooks and safety straps; may help train apprentices to this trade and perform other work as required.
<b>Minimum Qualifications</b>	<p>Knowledge of: Methods, materials, and equipment used in electric distribution line construction, including kinds and sizes of wire and cable, electrical and mechanical hardware, electrical transforming corrective and protective equipment; the hazards and safety practices of high voltage electrical work; electrical fundamentals applying to transmission distribution and customer service lines, street lighting systems, single- and three-phase star and delta power supplies and standards for protection of electrical system's familiarity with the principles of rigging for handling heavy line equipment and for unusual trenching and underground boring operations.</p> <p>Skill to: Climb metal poles and to climb wood poles using hooks; perform work at heights above the ground using tools of this trade in turning out a workmanlike product; use hot-stick and other protective equipment in a safe and efficient manner when working with highly energized power lines; follow oral and written directions; and use good judgment in working under hazardous conditions.</p> <p>Experience: At least three years climbing experience in overhead electrical line distribution work (may include apprenticeship); have a minimum of one year's climbing experience within the last two years.</p>
<b>Licenses/ Certifications</b>	Completion of a recognized high voltage line apprenticeship program.
	Must attain and/or maintain a Class A driver's license.
<b>Desirable Qualifications</b>	

## Comcast Cable Communications, Inc.

Requisition: #40880BR

Title: Communication Technician (Cable Installer)

Position Type: Full Time

City: Sacramento

State: CA

Reports to Title: Technical Operations Supervisor

### Job Responsibilities:

Through classroom and field training learn the processes for: Perform requested and non-pay disconnects, adhering to Comcast procedures and safe work practices, NEC and NESC requirements, and local ordinances in order to provide requested services. Pre-wire single unit dwellings in order to provide "ready hook-up" capabilities. Clean, maintain and stock vehicle and equipment in order to be prepared to perform required duties. Inspect existing ground or make new ground according to the National Electrical Code (NEC) in order to protect employees, customers, and equipment from electrical shock or damage. Complete associated paperwork with each work order in a timely manner in order to ensure all details of the work are recorded for entry in the customer's account once the work is checked in. Properly operate and maintain installation tools and equipment. Report need for vehicle repair or service when required and/or prescribed. Report any accidents, losses, injuries or property damage to supervisor and customer when appropriate. Apply knowledge and skills of training on the job in order to prepare for transition to CommTech 2. Perform other duties as requested by supervisor in order to achieve departmental goals and objectives. Punctual, regular, and consistent attendance.

### Minimum Requirements:

Operational Competencies: • Ability to use basic installation tools and hand tools • Ability to perform job from high places (on ladders and/or poles) • Ability to comply with safety procedures and requirements • Knowledge of basic mathematics • Ability to communicate with customers in a clear and straight forward manner • Ability to work independently Training/Licenses/Certifications: • Valid drivers license and satisfactory driving record • High school diploma or equivalent Work Environment/Physical Activities: • Climb poles, and ladders 18 to 20 feet above ground, as determined by the system's requirements • Lift and carry loads of 70 lbs. or more • Work in crawl spaces or attics • Work while standing 50 - 70% of the time • Drive company vehicle in a safe and responsible manner • Work and travel in inclement weather • Must be available to work overtime including weekends, evenings and holidays • Ability to manipulate objects such as pens, keyboard and mouse Core Competencies: Customer Focus: Able to communicate courteously and pro-actively; able to learn customers' short term and long term needs; see issues from customers' position, and recommend products or services; able to promote customer focus in employees and develop partnerships with customers. Conceptual Thinking: Able to apply common sense, theory and experience to decision-making; able to recognize similarities between past and present situation; able to identify key issues or use inductive reasoning in complex situations. Action Orientation: Able to persist and finish projects despite obstacles, or redirect when necessary; able to follow instructions or take action and address opportunities with little supervision; able to take extra steps to prevent mistakes or create opportunities. Listening, Understanding, and Responding: Able to use active listening skills or attend to non-verbal cues to better understand others' perspectives, behaviors or motivations; able to empathize with others' needs and respond sensitively; able to use good judgment when responding and respond to objections successfully. **Realistic Job Preview** Comcast is an Equal Employment Opportunity/Affirmative Action/Drug-free workplace employer.