

Kern Community College District

Workforce Development Plan 2023-2028

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Kern Community College District

Mission and Goals

The Kern Community College District (Kern CCD, District) mission is to provide outstanding educational programs and services that are responsive to our diverse students and communities.

Chancellor's & Board of Trustees' Goals

Advance Student Success & Equity
Resource Development
Develop Inter-district collaboration & cooperation
Develop Technology Infrastructure to support the colleges

Kern Community College District Strategic Plan

Goal #1: Maximize Student Success
Goal #2: Ensure Student Access
Goal #3: Provide Workforce & Economic Development
Programs that Respond to Local Industry
Goal #4: Reduce Equity Gaps
Goal #5: Strengthen Organizational Effectiveness

Service Area

Kern Community College District (Kern CCD) serves communities over 24,800 square miles in parts of Kern, Tulare, Inyo, Mono, and San Bernardino counties through the programs of [Bakersfield College](#), [Cerro Coso College](#), and [Porterville College](#). Governed by a locally elected Board of Trustees, the district's colleges offer programs and services that develop student potential and create opportunities for our citizens.

Kern CCD is geographically one of the largest community college districts in the United States, serving more than 30,000 students. Our students represent a diversity of religions, economic backgrounds, sexual orientations, abilities, and ethnicities.

While the Kern Community College District was established as a separate entity in 1968 to respond to the changing needs of our communities, educational services have been provided to residents for many years: at Bakersfield College since 1913; at Porterville College since 1927; and in the Ridgecrest area since 1951 by what is now Cerro Coso College. All three colleges are proud members of the [California Community College System](#) and are accredited by the [Accrediting Commission for Community and Junior Colleges \(Western Association of Schools and Colleges\)](#). Today, education centers and sites in Delano, downtown Bakersfield, the Mammoth/ Bishop area, Edwards Air Force, and the Kern River Valley offer additional convenient, localized instruction for thousands of residents. The Kern CCD's commitment to distance learning and other technological advances is creating increasing opportunities for education through the internet, satellite, and cable television to individuals across our broad service area and beyond.

Workforce & Economic Development Division

The Workforce and Economic Development Division is committed to equity, improved student success, and increased social and economic mobility. Through the leadership of Vice Chancellor Gerald, its mission is to: *actualize equity in education and the workplace, improve student success outcomes, and increase economic and social mobility for local citizenry.*

The Kern Community College District acknowledges the challenges and opportunities resulting from the rapid evolution of industries and the workforce. The Kern CCD is committed to delivering education and workforce opportunities that result in positive economic and social transformations for the families residing in the communities within its service area. The integration of technology such as virtual reality into industry practices and the need for critical workforce digital skills and the integration of high-quality workplace norms offer great promise toward building a stronger workforce, families, and communities. The Kern CCD’s Workforce and Economic Development Team continues to execute strategically significant efforts resulting in high-performing educational systems that increase equity, student outcomes, and increased social and economic mobility for partners and participants

Kern CCD’s Commitment to California Community College Systemwide Goals

<p>California Vision for Success Goals</p> <p>Increase the number of exiting CTE students employed in their field of study to 76% by 2022 (up from 60% in 2017)</p> <p>Reduce equity gaps by 40% across all the above measures by 2022 and fully close those gaps by 2027, including regional gaps</p> <p>Increase completion of degrees, credentials, certificates, and job specific skill sets by 20% by 2022 (2019-20 Baseline 145,218).</p>
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<p>Governor’s California Community College Roadmap</p>	
<p>Establish a baseline for and increase credit for prior learning (CPL) offerings annually. Increase access and enrollment in competency-based education (CBE) programs by 15%</p> <p>Improve systemwide graduation rates, transfer rates, and time to completion among underrepresented Pell Grant recipients and disabled students to meet average of all students by 2026.</p> <p>Increase percentage of completing students who earn a living wage by 15%,</p>	<p>Increase the percentage of students earning degrees, certificates, and specific skill sets for in-demand jobs by 20% by 2026.</p> <p>Close equity gaps in access to dual enrollment</p> <p>Increase the percentage of TK-12 students who graduate with 12 or more college units earned through dual enrollment by 15%.</p> <p>Focus on establishing or expanding programs that address workforce needs in healthcare, climate action, education, and early education.</p>

Workforce & Economic Development Assets, Strategies & Execution

The Workforce and Economic Development Division's assets include the Central Valley Mother Lode Regional Consortium, the Kern Adult Education Consortium, the 21st Century Energy Center and the California Compliance School. The Vice Chancellor works with college faculty and administrators to achieve state vision for success goals, districtwide, and college goals.

The [Central Mother Lode Regional Consortium](#) (CRC) members include 8 community college districts, 15 colleges, 230 public school districts, and 150 charter schools serving over 100,000 students. The region covers Kern County in the south to Stockton and eastward to the California state border. The CRC Chair, hosted at the Kern CCD, provides technical, logistical, and fiscal support for the 16 college members and their respective districts to address statewide system goals including student success, diversity, equity, inclusion, and access to education and assisting industry to reduce and meet regional labor market supply gaps. The Central Mother Lode Regional Consortium Current Projects are:

Strong Workforce Program – Since the closeout of SWP 5 in November of 2022, the CRC has invested in \$11.4M of its SWP 6 (2021-2023) funding in 11 regional projects in high priority industry sectors, including across all CTE areas (53%), Agriculture, Water, and Environmental Technologies, AWET (11%), Healthcare & Public Safety (8%), and Advanced Manufacturing (6%). Similar to SWP 6 funding (2022-2024), the CRC has invested \$10.5M in 13 regional projects with the distribution of funds supporting all CTE programs (56%), AWET (10%), and ADVDM (6%). Region-wide projects for both funding years included support for work-based learning platforms, including LinkedIn Learning, Jobspeaker, and Geographic Solutions; support for labor market research to focus on disaggregating data according to equity gaps in race and gender; support for local post-pandemic marketing for local colleges; support for Lightcast, formerly EMSI, to develop district-wide economic impact study for the 8 community college districts; and support for smaller projects, including membership in NACCE and a website redesign/update.

Talent Pipeline Management Academy, TPM/A: The CRC, in alignment with Strong Workforce Program goals to increase work-based learning opportunities that lead to quality jobs, voted to invest some of its SWP 7 funds in support of developing a clearer employer engagement model via the Talent Pipeline Management Academy. The CRC contracted with the US Chamber of Commerce Foundation, which developed the TPMA to redesign advisory committees as employer collaboratives where a neutral convener, such as a chamber of commerce, brings together employers from a specific industry sector and those involved in the talent pipeline, (i.e., colleges, WIOA partners, temporary agencies, CBOs, and other stakeholders). Together the CRC reviews local demand/supply gaps annually. The CRC approved 6-month training for a cohort of 45 people with the goal of developing a plan for starting industry specific employer Collaboratives.

K12 SWP: During the most recent round of K12 SWP 5 funding, the Selection Committee awarded 28 Local Education Agencies (LEAs) \$23 M. Over 70,000 students have been directly impacted by K12 SWP funding since its inception in 2018-19. The CRC is aligning its development of work-based learning opportunities including pre-apprenticeships, internships, dual/concurrent enrollment, and short-term certificate programs.

CERF: The [Kern County Community Economic Resilience Fund](#) (Kern CERF): The Kern Community College District Economic and Workforce Development Division serves as fiscal agent and is one of five regional Kern Coalition co-convenors that include: Better Bakersfield and Boundless Kern (B3K), a City of Bakersfield County of Kern led public-private partnership; Community Action Partnership of Kern (CAPK); the Kern Inyo Mono Central Labor Council (KIM CLC); and Building Healthy Communities (BHC). The Kern Coalition recognizes that despite years of extraordinary job growth and economic mobility for residents, Kern County is falling behind its peers and the nation in economic performance, opportunity, and inclusion. Market pressures, policy changes and an influx of lower quality jobs are some of the challenges. Currently only 30% of available jobs meet quality job metrics. Half of Kern residents struggle to cover basic expenses, and Hispanic or Black workers are 80% and 60% more likely to struggle. Driven by community aspirations, leadership, and data, Kern CERF will set a shared investment agenda and metrics to create more quality jobs and ensure access to them for all residents – focused on eliminating disparities while promoting durable economic growth and diversification alongside social and environmental resiliency. Momentum has been building to maximize emerging economic opportunities in the region. CERF will further this work by bridging the gaps among disinvested communities and traditional economic actors, ensuring representation, shared decision-making, and equitable distribution of resources to maximize shared regional prosperity.

The **21st Century Energy Center** is working to transform Kern County into a clean energy innovation hub, convening multi-stakeholder high-road workforce development partnerships, community, and involving industry in the development of innovative workforce development courses and programs. Kern Community College District's 21st Century Energy Center has been providing training since 2010, offering Construction Skills, Safety, Solar installation, Solar Sales, Industrial Maintenance Mechanic / Wind Energy Technician job skills training. The 21st Century Energy Center's current projects include:

The Energy Innovation Workforce Coalition The 21st Century Energy Center convenes the Energy Innovation Workforce Coalition of innovators, industry leaders, community-based organizations, and local governments. The coalition seeks to support economic and workforce development through integrated energy pathways - grid modernization and clean transportation growth. The coalition is committed to ensuring the maximum benefit from the emerging clean energy economy accrues to Kern County and its residents, especially those from underrepresented and underserved communities, are positioned with the workforce education and training necessary to realize those benefits.

New EV & Solar Energy Courses: The 21st Century Energy Center has been training individuals and first responders to work with alternative fuel vehicles since 2012. The coalition members' input led the 21st Century Energy Center to develop the Introduction to Zero Emission Vehicles and Careers class and established a partnership with the Kern County Electrical Apprenticeship program to provide Electric Vehicle Charging Installation pre-apprenticeship training. The Center is also developing an Electric Vehicle Charging Station Operations and Maintenance Technician training course, a Solar Business Development course, and a Solar Entrepreneurship course.

The Customized and Corporate Training program works with regional employers and other workforce development stakeholders to develop customized workforce training solutions. The Kern CCD's Customized and Corporate Training program conducts training needs assessments to develop innovative, flexible training solutions customized to meet customer needs. The types

of training developed vary from technical skills, medical skills, and computer software skills to leadership skills, customer service and communications. Over 25 regional employers utilize state Employment Training Panel funds via a Customized and Corporate Training program contract to offset some of the costs of customized training. Customized and Corporate Training Current Projects include:

Utility Line Clearance Arborist Program: The Customized and Corporate Training program currently offers a Utility Line Clearance Arborist class in partnership with Pacific Gas & Electric (PGE) and Butte College. Program staff are developing an Intro to Forestry training course in partnership with the Fresno Regional Workforce Development Board. Program staff work with all three district colleges to ensure that the customized training is appropriate for development into credit or noncredit courses and certificates.

California Compliance School is a joint effort between the California Department of Toxic Substances Control, the California Highway Patrol, and the California Compliance School to provide Hazardous Waste Manifest Training for businesses that generate hazardous wastes. The course meets the U.S. Department of Transportation's requirements and prepares a trainee to become certified as a DOT Hazardous Materials Employee that can sign and certify shipments as safe for transportation. Instructors are experienced trainers in EPA 40 CFR and DOT 49 CFR regulations covering transportation, inspection, and emergency first responders.

Kern Adult Education Consortium Adult schools and community colleges in Kern County are working together to expand access to adult education and develop programs that align with workforce needs. The Kern Adult Education Consortium works closely with the Kern Inyo Mono Workforce Development Board and the Kern CCD Workforce Development Division to identify certifications and training programs linked to higher wage jobs tied associated with fiscal mobility and stability. Students can earn a high school diploma or prepare for GED/HiSet exams at local adult schools with no out-of-pocket expense. Committed educators help guide students through the programs, which also include ESL and citizenship. With assistance from the consortium, students have access to affordable associate degree and certificate programs in areas that have a strong workforce demand. Kern Adult Education Consortium current projects include an improved website and the addition of a career exploration course.

The Kern Adult Education Consortium is also improving their online website. The goal of this process will be to develop a site where any adult in our district can come to obtain information about course offerings, careers in the region, and program maps towards the careers they are interested in.

Get Focused Stay Focused: Kern CCD was awarded a Perkins Reserve Innovation Grant of \$300,000 to provide Career Choices and Changes Curriculum for our adult education students. The Get Focused, Stay Focused courses will take place in distance learning cohorts, self-paced distance learning, and in virtual-reality classes for adult students in our district. This project will help our adult education students understand the career pathways available to them at our adult schools, community colleges, and industry partners here in their area. This project's goal is to increase access for our rural adult education students and provide opportunities for students who may not be able to attend traditional classroom environments due to time, distance, and other barriers.

Strategies & Execution

The Kern CCD’s Workforce and Economic Development Division executes a variety of strategies to accomplish our mission to increase student success outcomes, normalize equity in education and the workplace, and increase economic and social mobility for the region. The following high-level approaches are intertwined and strategically aligned to move us toward our goals. They include resource development, high-performance industry, and stakeholder coalitions, CTE program support and development, and targeted outreach to adult learners disengaged from education and the workplace.

Resource Development	Kern CCD Coalitions	CTE Development & Support	Workforce & Economic Mobility (Adult Learners)
CERF (\$5M) CREL (\$50M) Strong Workforce (\$8M) Perkins / VTEA (\$1.8M) CWDB HRTP (\$4.5M) CA Division of Apprenticeship Standards (\$4M) K16 Initiative (\$3.9M) RERP Regional Equity & Recovery Program (\$400k) LAEP/WEX Internships (\$6.5M) KIM WDB ETR Partnership & Resource Sharing National Renewable Energy Laboratory (NREL) Partnership & Resource Sharing Coalition of Coalitions	Energy/Energy Innovation California Energy Renewable Lab (CREL) Centers of Excellence Healthcare HEAL Defense & Aerospace Manufacturing Alliance of Kern Central Valley Mother Lode (CC) Regional Consortium Adult Education Consortium NEXT: Business & Entrepreneurship Logistics / Transportation Early Childhood Education	CTE Credit / Non-Credit Curriculum Development Expansion of: Apprenticeship Credit for Prior Learning Competency Based Education Strong Workforce Metrics Equity Forward Initiatives VTEA Funding Metrics REACH SCFF Alignment: Complete 9+ CTE units / year Attain regional living wage	Center for Economic Mobility Providing education & jobs for Underemployed Disconnected Youth English Language Learners & Dislocated Workers Industrial Automation Mobile Lab. Serving incarcerated students. Welding Mobile Labs. Serving homeless initiatives and work experience projects

Service Area Economic Overview

The Kern CCD service area includes all or part of Kern, Tulare, Inyo, and Mono counties. An estimated total of 1.4 million people live in and are served by the district (US Census Bureau, 2022). There are several microeconomies within the region. Agriculture is the dominant industry in the San Joaquin Valley basin portions of Kern and Tulare counties. Oil and gas construction and service industries are the largest business in western Kern County. In eastern Kern County the aerospace industry and military facilities are the primary economic drivers. In Inyo and Mono counties, hospitality and tourism are the dominant industries. This section provides more detailed information regarding each of these sub-regions within the Kern CCD service area.

Kern County

Kern County is the third largest California county (8,132.2 sq. mi.), and home to 917,673 people (2021 US Census estimates). The majority, 56.1% of the county population, are Hispanic, 31.1% are white, 6.3% Black, and Asian residents represent 5.6% of the total population (US Census). Approximately 18.3% of persons in the county were in poverty, and the per capita income in the past 12 months was \$23,858, with a median income of \$54,851.

The Kern County 2020 real GDP was \$48,674,498, a slight decline of -1.1% from the prior year (U.S. Bureau of Economic Analysis). Out of 58 California counties, Kern County ranks 21 in real GDP for 2020 (B3K Market Assessment). UC Merced (2022) finds that while Kern County's workforce grew by 51 percent between 2000 and 2019, which continues to increase the overall GDP for the area, per capita GDP has been highly volatile. Between 2000 and 2009, per capita GDP grew more than any other California county at 34.9 percent; however, it has declined by 4.4 percent since 2009, which is the third-worst rate in the state.

There is a recognized need to diversify the County's industry and employment base; strengthen existing and emerging industry clusters; ensure social equity in economic development measures through targeted training and geographic areas of focus; provide greater resiliency and adaptation for the oil and gas and agricultural sectors as a result of the current policies affecting environmental, water management, and the general business climate; and leverage the range of benefits associated with the major industries, economic shifts, challenges & opportunities in the region, including opportunities for remote work, spurred by the Covid-19 pandemic (Bakersfield EDSP, Kern CEDS).

Kern County's sub-regional economies are distinct. East Kern is dominated by government and military installations, commercial scale solar and wind, and aerospace. In West Kern, fossil fuels are the primary industry and is the area that holds the most promise for carbon management and storage solutions. The North, Central, and South Kern subregions the leading industry sectors are agriculture, food manufacturing, business services, healthcare, retail, and logistics.

In West Kern, the fossil fuel industry is facing significant climate change related shifts toward carbon management and storage. In East Kern, wind and solar renewable energy generation facilities dominate the landscape. The Mojave Air and Space Port infrastructure is a critical component to growing area research, scientific, and technical industries, despite the relocation of a few aerospace companies outside California. The North, Central and South Kern subregions are facing significant drought, extreme heat, increases in energy prices, and reduced grid stability affecting its Agriculture, food manufacturing, healthcare, logistics, and retail industries.

Economic development opportunities such as carbon management, transportation electrification, expansion of solar and wind commercial energy production, implementation of microgrid technology to offload energy demand from the grid, and other innovative energy solutions - all make sense to develop, test, and implement in Kern County.

Tulare County

Tulare County's 2022 population is estimated to be 477,054 (US Census Bureau, 2022). Of the total population approximately 66.7% identified as Hispanic, 1.2% Black / African American, 1.8% Asian, and 2.8% American Indian / Alaskan Native (US Census Bureau, 2022). The leading industry sectors in Tulare County are agriculture, dairy / animal husbandry, food manufacturing, business services, healthcare, retail, and logistics.

Inyo & Mono Counties

Inyo County's 2022 population is estimated to be 18,970 people and Mono County's population is estimated to be 13,247 people (US Census Bureau, 2022). Of the total population of Inyo County, approximately 24.5% identified as Hispanic, 1.2% Black / African American, 1.8% Asian, and 14.1% American Indian / Alaskan Native (US Census Bureau, 2022). Of the total population of Mono County, approximately 27.2% identified as Hispanic, 1.1% Black / African American, 2.3% Asian, and 3.0% American Indian / Alaskan Native (US Census Bureau, 2022). Inyo and Mono Counties features pristine wilderness, lakes, and geothermal resources making hospitality and tourism a primary industry.

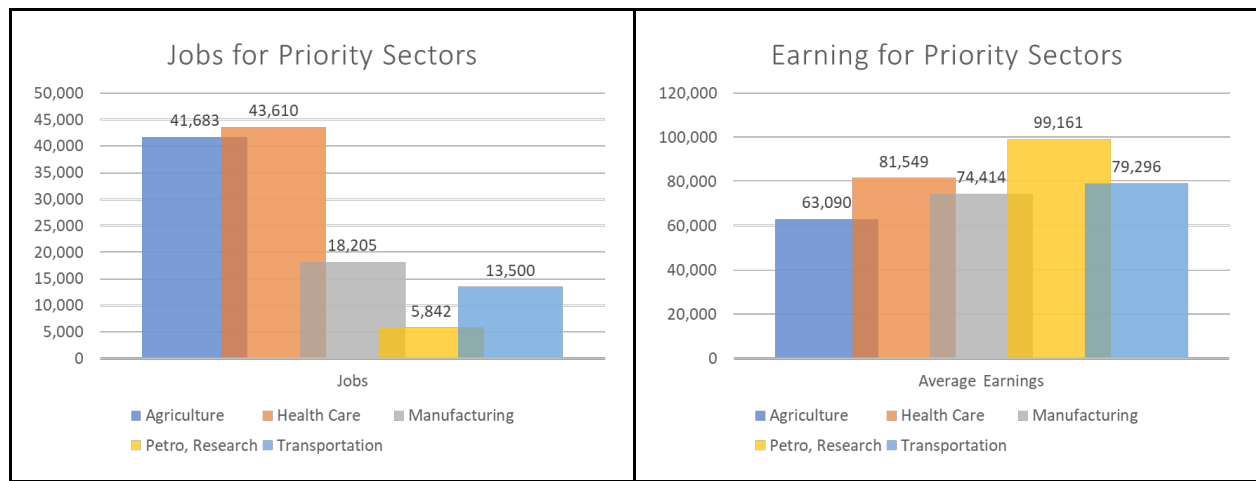
Kern Community College District’s Priority Sectors

Based on the economic jobs and wage data, local economic analyses, regional industry analyses, and program advisory board member input, the Kern Community College District has identified the following industry sectors of focus:

Healthcare
 Energy
 Advanced Manufacturing
 Agriculture

Business, Business Services &
 Entrepreneurship
 Transportation & Logistics
 Defense & Aerospace

Several factors were considered in selecting these industry sectors. The industry footprint, the workforce supply gap, especially in industries that offer quality jobs, entry level jobs and career advancement opportunities was also considered. The following illustrations show the number of jobs for each of the priority sectors and the average industry earnings.



The Healthcare industry’s 43,610 workers have average earnings of \$81,549. The 5,842 Energy industry employees earn wages averaging \$99,161 per year. Advanced Manufacturing employs 18,205 people with average annual wages of \$74,414 per year. Agriculture employs 41,683 people with average annual wages of \$63,090. Precision agriculture presents higher wage IT and data management opportunities. Business and entrepreneurship have been a steady component of the economic base. Recent studies suggest that back-office services may present an opportunity for expansion. The Transportation / Logistics industry employs 13,500 people with relatively high average annual wages of \$79,296. Subsequent sections examine each industry sector’s labor market supply and demand as well as future industry challenges and opportunities.

Why are these the Priority Industry Sectors?

The City of Bakersfield, the County of Kern, the Kern EDC, and other local agencies and organizations regularly conduct economic development and workforce development needs assessments and analyses which support the selection of KCCD priority industry sectors.

Priority Sector	Economic / Workforce Development Needs Assessments
Advanced Manufacturing	SJV Regional Workforce Plan (2017-20); and Kern County Incentives Policy (2020), B3K Prosperity, Market Assessment Data Book and Findings (2021).
Aerospace	CEDS 2012-13; Economic Road Map (2015); East Kern Diversification Strategy (2017); SJV Regional Workforce Plan (2017-20); Kern Inyo Mono WDB Workforce Plan (2017-20); Kern County Incentives Policy (2020), B3K Prosperity, Market Assessment Data Book and Findings (2021).
Energy - Carbon Management	SJV Regional Workforce Plan (2017-20); and Kern County Incentives Policy (2020), B3K Prosperity, Market Assessment Data Book and Findings (2021).
Ag, Energy Water Agriculture, Energy, Renewable Energy & Water	CEDS 2012-13; Economic Road Map (2015); SJV Regional Workforce Plan (2017-20); Kern Inyo Mono WDB Workforce Plan (2017-20); and Kern County Incentives Policy (2020), B3K Prosperity, Market Assessment Data Book and Findings (2021). East Kern Diversification Strategy (2017), B3K Prosperity, Market Assessment Data Book and Findings (2021).
Business 2nd / Back Office	CEDS 2012-13; Economic Road Map (2015); East Kern Diversification Strategy (2017); SJV Regional Workforce Plan (2017-20); Kern Inyo Mono WDB Workforce Plan (2017-20); Kern County Incentives Policy (2020), B3K Prosperity, Market Assessment Data Book and Findings (2021).
Healthcare	CEDS 2012-13; Economic Road Map (2015); East Kern Diversification Strategy (2017); SJV Regional Workforce Plan (2017-20); Kern Inyo Mono WDB Workforce Plan (2017-20); Kern County Incentives Policy (2020).
Transportation & Logistics	CEDS 2012-13; Economic Road Map (2015); East Kern Diversification Strategy (2017); SJV Regional Workforce Plan (2017-20); Kern Inyo Mono WDB Workforce Plan (2017-20); Kern County Incentives Policy (2020).

Healthcare Industry Sector

The San Joaquin Valley (SJV) is one of the poorest, least healthy, and fastest growing areas of California (1,2). The Kern Community College District 28,000 square mile service area includes parts of Kern, Tulare, Inyo, and Mono counties. In Kern and Tulare counties, the percentage of persons living in poverty is 18.3% and 17.1% respectively; rates which are greater than the state (11.5%) or the US (11.4%) poverty rates. One third (33%) of the region's population are eligible for Medi-Cal. The region has historically suffered from a shortage of medical health professionals (2). The five SJV counties' residents have poor health outcomes ranking 37 and worse. Kern and Tulare counties ranked 50 and 53 out of 58 counties.

Current Healthcare Workforce Projects

The Kern Community College District is engaged in the following current projects, pending grant applications, and high priority resource development objectives.

Medical Professional Education Pipeline

Bakersfield College (BC) and the Kern CCD have prioritized supporting pre-medical students and establishing a pre-medical professional education pipeline. Bakersfield College has supported the re-establishment of a pre-medical student organization and developed a series of workshops and academies to provide students interested in medical professions with the information they need to be successful, provide STEM course guidance and support, provide field trips to medical schools, and medical school application and financing information that often presents barriers for San Joaquin Valley pre-medical students. A KCSOS K16 subaward of \$447,439, is supporting the development of student academies and workshops, modeled largely after medical schools' student outreach, engagement, and support programs. Partnerships with Western University and UC Merced have made considerable progress toward establishing a robust medical professional student pipeline. Early accomplishments that include the development of linkage agreements and transfer relationships are described below.

Western University of Health Sciences: BC, Kern CCD, Kern Medical, and California State University Bakersfield (CSUB) have been working with Western University to develop and implement pre-medical student academies, support students' medical school application preparation, and establishment of course linkage agreements for Chemistry B1A and B1B, Math B6A, Physics B4B, PHYS B2A courses. [Western University](#) features colleges of osteopathic medicine, health sciences, pharmacy, graduate nursing, dental medicine, optometry, podiatric medicine, and veterinary medicine. Initially, the partners are working with the College of Osteopathic Medicine and are interested in expanding to other medical professions programs in the future.

UC Merced: The California Wellness Foundation funded a UC Merced partnership with Bakersfield College / Kern CCD and several other community colleges to map BC (and other partner community college) courses and student support needs to ensure diversity, equity, inclusion, and access for aspiring pre-medical students interested in applying to UC Merced's new medical school. This 18-month project began in 2023 and is expected to conclude in 2024.

Nursing & Nursing Educational Programs

Bakersfield College (BC), Cerro Coso Community College (CCCC), Porterville College (PC), and the Kern Community College District are implementing new and expanding existing medical assistant, nursing assistant, vocational nursing, and registered nursing programs. Regional employers report a significant shortage of registered and vocational nurses. To address this gap, Kern CCD college faculty are collaborating to grow the vocational and registered nursing program student pipeline.

Bakersfield College currently offers nursing assistant, vocational nursing, radiology technician, respiratory technician, and registered nursing programs. BC has invested in its campus clinical lab space, added clinical instructors and clinical sites. Starting in Spring 2023, BC is starting a Nursing Assistant Training Program, in Fall 2023, BC's RN cohort size increased from 50 to 90 students and an additional increase to 140 students is pending (as of 4/1/2023). The BC part time evening Licensed Vocational Nurse LVN to RN Program will begin in Summer 2023. A Perioperative Nursing Apprenticeship Program was approved by the California Community College Chancellor's Office (CCCCO) California Apprenticeship Initiative (CAI) and will begin training in 2023.

Cerro Coso Community College currently offers emergency medical technician (EMT), human services, certified nursing aide, medical assisting, medical billing and coding, home health aide, and licensed vocational nursing. Cerro Coso is implementing innovative distance learning health programs to ensure equitable access to education and training to people living in rural and remote areas.

Porterville College offers emergency medical technician (EMT), psychiatric technicians, and registered nursing. Over the past year, the new Allied Health Facility, a \$22M science building has been added to the campus. Porterville College nursing program received \$425,080 for 2019-2023 enrollment growth. Starting in Fall 2023, PC's RN cohort will be doubled from 20 to 40 students starting in Fall 2023.

Kern CCD Enrollment Growth grants to address nursing workforce needs - California Community Colleges Chancellor's Office awards funded under Nursing and Allied Health for Nursing Program Support.

- Bakersfield College, \$676,604 for 2019-2023; and
- Porterville College, \$425,080 for 2019-2023.

BC's Public Health Informatics Bakersfield College and the Kern CCD are partners in a statewide collaborative funded by a US Health and Human Services (US HHS) grant to develop curriculum to train public health informatics job skills and support the diversification of the public health workforce.

Healthcare Workforce Supply Gaps

The SJV has the lowest ratios of licensed physicians (MDs and DOs), nurse practitioners (NPs), registered nurses (RNs), therapists, counselors, and social workers per 100,000 population in California and the second lowest ratios of physician assistants (PAs), certified nurses (CNs) and psychologists per capita (1,2). There are 157 medical doctors per 100,000 residents in the SJV compared with 411 in the Bay area. Similarly, there are 45 primary care physicians per 100,000 residents in the SJV compared to 157 primary care physicians per 100,000 residents statewide.

Kern County has a severe shortage of medical professionals across all fields of care including Primary Care, Pediatrics, Allergy & Immunology, Cardiology, Dermatology, Endocrinology, Gastroenterology, Neurology, Rheumatology, Oncology Surgery, Ophthalmology, Orthopedics, ENT, Urology, Psychiatry, and Radiology. Labor market data for physicians, surgeons, and physician assistants indicate no regional completions and a sizable number of 2020 hires and projected openings per year through 2030.

Table 1: Projected Kern County Jobs, Hires, Separations, and Annual Openings (1)

Position Title	SOC	2020 Jobs	2020 Hires	2020 Separations	Avg Annual Openings	2030 Jobs
Physicians	29-1210	1,310	189	241	42	1,352
Surgeons	29-1240	104	12	27	3	101
Physicians Assistants	29-1070	191	71	49	18	253
Registered Nurse RN	29-1140	5,324	1,082	1,215	363	5,988
Vocational Nurse VN / LVN	29-2060	1,196	527	501	117	1,400
Medical Assistant	31-9092	2,148	1,246	1,286	304	2,491
Medical Support Staff	43-6013	1,569	812	915	193	1,730

Kern County lacks sufficient healthcare professionals, resulting in long wait times for medical services and increased disease severity at diagnosis. Those with resources seek care outside the SJV. Those with fewer resources are left to navigate limited services and delays in treatment. The US Dept. of Labor Outlook indicates a 16% job growth for public health and related medical occupations, and local labor market indicators mirror this trend. Table 2 provides a snapshot of current workforce demand for RNs, LVNs, medical assistants, and medical support staff. Expanding healthcare and medical education opportunities is critical as healthcare and medical professionals often prefer to practice in the region in which they live or are trained. Given the projected health workforce shortages and persistent maldistribution of providers, there is a compelling rationale for expansion of educational opportunities that is well-planned and aligned with community needs.

Table 2: Healthcare Sector Job Commitments (2/10/2022)

Employer (*CBA I worker owned)	Job Title	# Jobs	Annualized Starting Wages	Annualized Top Wages
Adventist Health	RN	112	\$84,510.40	\$139,838.40
Allied Up*	RN	40	\$187,200.00	\$228,800.00
Bakersfield Family Medical	RN	10	\$101,088.00	\$101,212.80
Dignity*	BH RN I/II/III	500	\$81,764.80	\$169,644.80
KC Behavioral Health*	PH Nurse- RN	5	\$65,853.36	\$103,540.80
KC Public Health*	RN	15	\$62,649.36	\$98,503.32
Kern Medical*	RN	>100	\$71,000.00	\$110,000.00
Adventist Health	VN	5	\$52,540.80	\$77,708.80
Allied Up*	VN	75	\$60,320.00	\$81,120.00
Bakersfield Family Medical	LVN	13	\$61,006.40	\$65,561.60
Dignity*	LVN	5	\$56,160.00	\$72,800.00
KC Behavioral Health*	VN 1/11	12	\$42,037.08	\$55,507.68
KC Public Health*	LVN I/II	2	\$42,037.08	\$55,507.68
Adventist Health	NA	50	\$33,966.40	\$45,219.20 to
Allied Up*	Med/Support Staff	77	From \$39,520	\$124,800.00
Bakersfield Family Medical	Med/Support Staff	51	From \$36,816	To \$61,006
Dignity*	Med/Support Staff	91	From \$33,280	To \$87,360
KC Public Health*	M.A.	2	\$34,606.32	\$41,357.64
KC Public Health*	PT, OT	4	\$81,199.08	\$97,040.28
Kern Medical *	CNA, MA	>80	From \$32,000	To 41,000
7 Employers	Sector Total Jobs	1,249		

RN Registered Nurse, VN Vocational Nurse, NA Nursing Assistant, MA Medical Assistant
PT Physician Therapist, OT Occupational Therapist

Lack of Diversity and the Need for Diversity, Equity, and Inclusion

Among middle skill healthcare jobs ranging from medical secretaries and administrative assistants (earning \$17.64 per hour) to registered nurses (earning up to \$44.19 per hour) there is an underrepresentation of men (15% of the workforce), white workers and Hispanic or Latino workers and an overrepresentation of Asian American workers compared to the geographic area population (5). In professional medical occupations such as physicians, osteopaths, and physician assistants, there is an underrepresentation of men, white and Hispanic or Latino professionals and an over representation of Asian American professionals compared to area population (6).

Talent Pipeline

Over the past five years, BC, CCCC, and PC graduated 4,353 nursing professionals / healthcare paraprofessionals and increased the number of graduates in the last two years in response to COVID. In 2021-22, BC graduated 149 nursing students (including vocational nursing (VN), Licensed vocational nursing to associate degree Nursing (LVN to ADN), and registered nursing (RN) students) and 1981 healthcare paraprofessionals (including emergency medical technicians (EMTs), medical assistants (MAs), and nurse assistants (NAs)). CCCC graduated 27 nursing students and 22 healthcare paraprofessionals. PC graduated 19 nursing students and 55 healthcare paraprofessionals.

KCCD: Healthcare Occupations	2017-18	2018-19	2019-20	2020-21	2021-22
Bakersfield College	522	620	555	769	829
Cerro Coso Community College	64	113	122	93	112
Porterville College	110	143	84	110	107
	696	876	761	972	1,048

The talent pipeline does not offer a ready solution to meet the healthcare needs of the SJV or the Kern CCD service area. There are multiple constraints on the talent pipeline. There is a lack of representativeness among STEM faculty and students who complete STEM education and that are interested in pursuing healthcare or medical professional occupations. Healthcare accreditation entities and medical schools manage and limit the number of students able to enter healthcare and medical school programs. Healthcare programs have experienced a persistent lack of faculty and clinical placement options in the Kern CCD service area and across the SJV that in turn limits the number of students the accreditation entities will permit.

Healthcare accreditation entities, established to ensure quality education, limits the number of students entering healthcare programs. Limited faculty and clinical instructors, program costs and long-term demand serve to constrain program expansion. Local program completion rates are between 75-80% of incoming students. The limited number of healthcare professionals willing to serve as faculty and limited clinical placement opportunities constrain program expansion. Program completions from MAs through RNs have been significant across occupations. Until recently, the SJV has not had a medical school in the SJV. Local teaching hospitals host residents each year. Supply gaps in healthcare workforce and medical professionals are significant and persistent. Over the next decade or so, the region will face the loss and retirement of a considerable number of medical professionals as 30% of physicians and 37% of psychologists are over 60 years old compared to 17% statewide (2).

Work-Based Learning

Work-based learning has always been an integral component of healthcare education. All three colleges have expanded work-based learning, clinical labs, and internship opportunities for healthcare students. Despite increased focus, accrediting body requirements, and significant effort, persistent gaps remain in ensuring an adequate number of opportunities for students to gain direct clinical experiences in the allied health science field. Early exposure of high school and early college students to the medical field through direct clinical experience is important. This provides students opportunities to connect their textbook knowledge to real world scenarios, to evaluate their interests, and network and meet other trainees. Many admissions officers will look at an applicant's clinical health care experiences as a key determining factor for acceptance to medical school. By expanding training opportunities in the region, students will be more competitive for medical school applications. Investments in clinical training opportunities are important as health professionals often prefer to practice in the region in which they train and are critical to providing health professionals with the racial/ethnic, cultural, linguistic, and socio-economic backgrounds similar to those of the region's population. As part of this program, CMSP candidate students will be involved in Kern Medical's

Emergency Medicine Research Associate Program (EMRAP), SIMRAP, and Valley Fever Research programs that provide students with essential exposure to clinical settings.

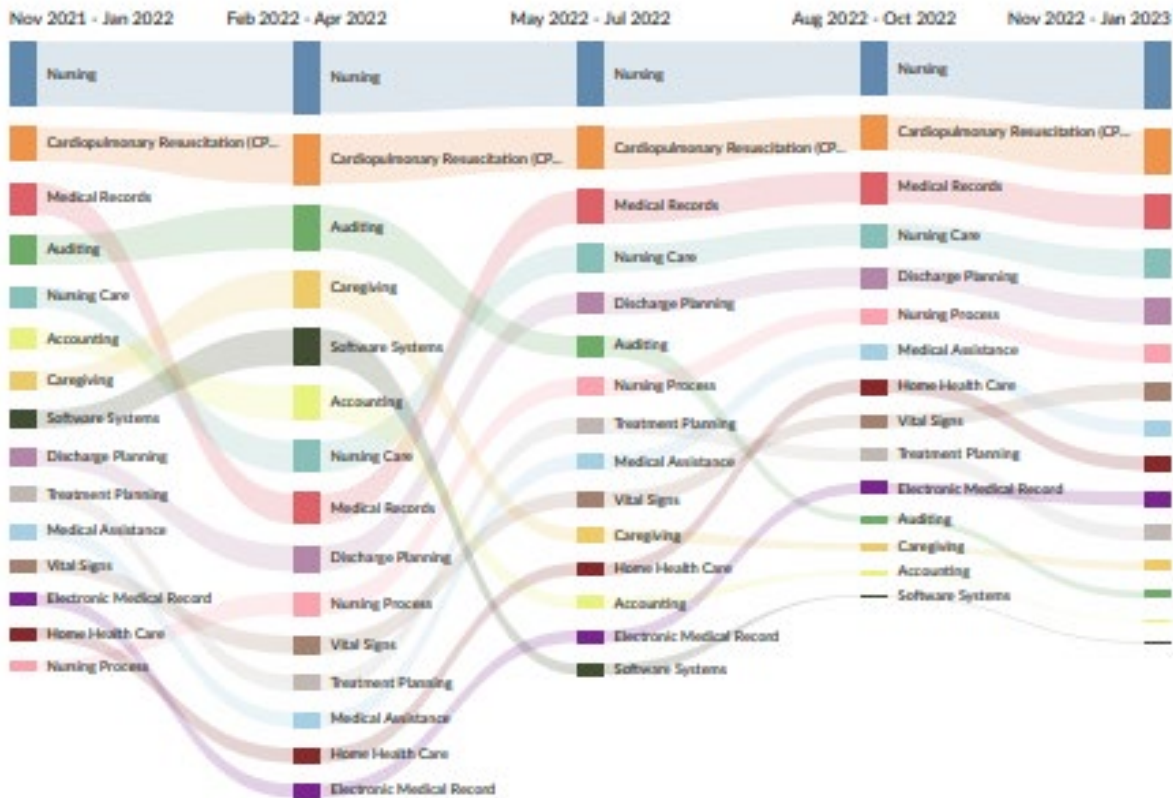
Top Emergent Competencies / Core Competencies

Illustration #1, below, provides a summary of the top skills listed in employers’ job postings for all job types in the top ten healthcare industries in Kern County and Kern CCD’s four-county area including Kern, Tulare, Inyo, and Mono Counties. The healthcare industry sectors included in this summary of industry skills are Offices of Physicians (except mental health specialists; 62-1111), Offices of Physicians, Mental Health Specialists (62-1112), Offices of Mental Health Practitioners (62-1330), Offices of all other miscellaneous Health Practitioners (62-1399), Outpatient Mental Health and Substance Abuse Centers (62-1420), HMO Medical Centers (62-1491), All other Outpatient Care Centers (621491), Home Health Care Services (62-1610), All other miscellaneous ambulatory health care services (62-1999), Residential Mental Health and Substance Abuse Facilities (62-3220), state hospitals (90-2622) and local hospitals (90-3622).

Illustration 1. Top 15 Skills for all Job Types by Quarter in 12 Healthcare Industry Sectors in Kern, Tulare, Inyo & Mono Counties

Top 15 Skills for All Job Types by Quarter

Skills help us understand the direction an industry is headed.



(Source: Lightcast. Industry Snapshot Report. Retrieved February 8, 2023)

The top 10 skills listed in job postings were nursing, CPR, medical records, nursing care, discharge planning, nursing process, medical assistance, home health care, vital signs, treatment planning and electronic medical records. Among those skills the last four, auditing, caregiving, accounting, and software systems moved from relatively high frequency in job postings to much lower frequency comparing the November 2021 - January 2022 quarter to the November 2022-Jan 2023. The report does not provide an analysis regarding the shift in skills listed in job postings, nor does the report suggest an explanation for the shift in skills listed in job postings described above.

Emerging Opportunities

Healthcare workforce grant funding has historically come from the US Health and Human Services (US HHS), Health Resources and Services Administration (HRSA), the US Department of Labor (US DOL), the California Workforce Development Board (CA CWDB), and the California Community College Chancellor's Office (CCCCO). The COVID-19 pandemic significantly impacted the healthcare industry from outpatient physicians' offices to hospital level care and there has been increased funding of healthcare workforce grant opportunities. Kern CCD has applied for several of these including:

Expanding Clinical Instructors - US DOL Nursing Expansion Grant application pending.

Apprenticeships - LVN-RN - California Apprenticeship Initiative (CAI) Bakersfield College Perinatal and Neonatal Nursing (Planning Grant) pending.

Apprenticeships - California Apprenticeship Initiative (CAI) - Bakersfield College LVN to RN (New and Innovative Grant Fund) pending.

Apprenticeships - California Apprenticeship Initiative (CAI) - Public Health Informatics (Planning Grant to get PHIT listed as a registered apprenticeship with US DOL and CA DAS) pending.

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4. U.S. Census Bureau (2022). American Communities Survey: [Quick Facts Kern and Tulare counties, California, and United States](#).
5. Centers of Excellence (2022). [South Central Valley/ Southern Mother Lode Subregional Labor Market Overview](#).
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Energy Sector Industries

Energy industries are one of the largest industries in the Kern Community College District service area, including traditional oil and gas industry, solar and wind clean renewable energy, electrification, and emerging carbon management industries. Employment in the Energy Industry is undergoing an accelerated transformation. The oil and gas industries are expected to see job losses of more than 10,000 jobs by 2030 while job growth is expected in the clean renewable energy industries. The amount of job growth is dependent on the speed of state and national climate policy implementation and the presence of a skilled regional workforce. Statewide in 2021, clean energy jobs grew 13% compared to a 6% growth rate for all jobs. Funding contained in the Bipartisan Infrastructure Law and the Inflation Reduction Act and California's \$8.1 billion investment in energy projects in the 2022 state budget are expected to accelerate the growth in clean energy jobs. Kern Community College District is working with partners to ensure that the region realizes the maximum economic benefits of clean energy innovation and that those benefits accrue equitably to all community members.

Current Energy Workforce Projects

California Renewable Energy Lab (CREL)

The California Renewable Energy Lab is an extension and expansion of the work initiated through the Valley Strong Energy Institute and Bakersfield College's partnership with the National Renewable Energy Lab (NREL). CREL is designed to provide workforce development and community education for the entire Kern Community College District service area. CREL is organized across three centers of excellence:

1. California Resources Corporations Carbon Management Institute.
2. Clean Transportation Center of Excellence.
3. Clean Energy Innovation and Microgrids Center of Excellence.

CREL was provided \$50M in 2022/23 state budget funding. These funds will be used to accelerate the development of workforce development and community education projects and to provide the capital equipment to support these efforts. These expenditures include the development of demonstration projects in Carbon Capture and Storage and Microgrids through a campus as a living lab approach and equipment to support training for medium to heavy duty commercial electric vehicle maintenance and charging infrastructure.

Bakersfield College

Valley Strong Energy Institute

The Valley Strong Energy Institute is the current iteration of the Bakersfield College Energy Technology Transfer & Workforce Development Initiative. The Valley Strong Energy Institute has played a key role in community education through its Ag/Water/Energy Education series. The Valley Strong Energy Institute recently launched its first workforce development class ENER B54NC *Sustainable Energy* which is part of the newly created Modern Energy certificate. The other classes in the certificate are ENER B52NC *Carbon Capture and Storage* and ENER B53NC *Energy Data Analysis*.

Automotive Technology Program

The BC Automotive Technology program includes an Introduction to Electric Vehicle class (AUTOB70NC) and is developing a comprehensive set of electric vehicle training courses.

Kern CCD 21st Century Energy Center

Since 2010, the 21st Century Energy Center has trained over 1,000 individuals for entry-level renewable energy jobs as Solar Installers, Wind Turbine Technicians, and Utility Line Workers. The 21st Century Energy Center is currently offering Solar Installation, Utility Line Clearance Arborist, Vegetation Management Pre-Inspector, Basic Rigging, Intro to Zero Emission Vehicles and Careers, Intro to Clean Energy, Electrical Safety / NFPA 70e Certification, and ZEV Charging Infrastructure Installation in partnership with the IBEW Kern County Electrical Apprenticeship training center, including the Electrical Apprenticeship Readiness Training. 2024 courses include EV Charger Maintenance & Repair, Basic Construction Skills, Hydrogen Fueling infrastructure, and Industrial Energy Efficiency Assessment Training.

Energy Innovation Workforce Coalition

This spring, Kern CCD hosted the first meeting forming the Energy Innovation Workforce Coalition. The Energy Innovation Workforce Coalition focuses on bringing stakeholders together to understand emerging workforce needs and to create a dialogue to develop strategies to help maximize economic benefits from clean energy innovation and ensure equitable access to these benefits. During this meeting three employer led sub-committees were formed:

- Carbon Management
- Clean Energy Innovation and Microgrids
- Clean Transportation

The Carbon Management sub-committee group has been focused on establishing a Direct Air Capture (DAC) Hub in Kern County and participating in the DOE Communities LEAP (Local Energy Action Plan) Carbon Management Park Project. The Clean Energy Innovation and Microgrids sub-committee has also been participating in the DOE Communities LEAP Community Resilient Microgrid project. All three sub-committees have led to partnerships that are accelerating Kern CCD's energy industry work.

Workforce Supply Gaps

The size of the permanent workforce employed in carbon management, microgrids, and transportation electrification is not fully known. These and other clean energy innovations are in preliminary or emergent stages of commercialization. State climate goals are driving investment, development, and construction of facilities creating temporary construction trades jobs. Determining the size and duration of both the construction workforce, and the number and type of quality permanent clean energy jobs are critical to ensuring availability of immediate upskilling and long-term training programs.

The following table lists the current projections of the employment for trades persons. The counties' employment patterns are distinct. Kern County has more electricians, plumbers and pipefitters, and welders. The historic basis of the employment projections may not accurately estimate the future demand for workers given the changes in state policies and the emergence of new energy industries and processes. In addition, traditional oil and gas is expected to shed jobs over the next few years. Tradespersons currently working in oil and gas may fill emerging clean

energy jobs, a positive outcome, that may impact the number of available jobs to traditional age individuals interested in becoming tradespersons.

Tables 1. Carbon Management & Renewable Energy Workforce by County

Top Occupations by County	Annual Openings	Jobs 2020 & 2025		5-Year change Number & Percent		Median Wage
Kern County						
Civil Engineers (17-2051)	49	522	635	114	21.8%	\$93,538
Civil Technologist/Technician (17-3022)	18	133	190	56	42.4%	\$60,674
Construction Management	68	575	629	53	9.3%	\$105,019
Electricians (47-2111)	227	1,221	1,386	165	13.5%	\$62,421
Electricians – Helpers (47-3013)	20	114	92	-22	-19.2%	\$37,502
Cement masons & finishers (47-2051)	52	607	511	-96	-15.8%	\$47,403
Plumbing, Pipefitting & Steamfitters	139	968	1,099	131	13.5%	\$61,027
Sheetmetal workers	25	183	221	37	20.4%	\$59,446
Welders	125	1,049	1,073	24	2.3%	\$46,771
Tulare County						
Civil Engineers (17-2051)	15	150	165	14	9.7%	\$93,267
Civil Technologist/Technician (17-3022)	7	56	65	9	16.3%	\$60,674
Construction Management	25	194	268	74	37.8%	\$94,931
Electricians (47-2111)	95	536	566	30	5.5%	\$60,757
Electricians – Helpers (47-3013)	12	<10	62	insuff	insuff	insuff
Cement masons & finishers (47-2051)	20	260	203	-57	-22.1%	\$45,614
Plumbing, Pipefitting & Steamfitters	66	428	524	96	22.4%	\$70,970
Sheetmetal workers	21	143	170	27	18.8%	\$59,342
Welders	63	464	465	1	0.3%	\$39,161
Inyo & Mono County, combined						
Civil Engineers (17-2051)	2	25	27	2	5.2%	\$106,917
Civil Technologist/Technician (17-3022)	1	<10	<10	Insuff	Insuff	Insuff
Construction Management	1	20	19	-1	-5.9%	\$110,009
Electricians (47-2111)	6	44	48	4	10.0%	\$56,542
Electricians – Helpers (47-3013)	0	<10	<10	Insuff	Insuff	Insuff
Cement masons & finishers (47-2051)	3	17	15	-2	-11.6%	\$58,581
Plumbing, Pipefitting & Steamfitters	4	32	38	6	18.6%	\$58,748
Sheetmetal workers	1	<10	<10	Insuff	Insuff	Insuff
Welders	1	<10	<10	Insuff	Insuff	Insuff

Lack of Diversity and the Need for Diversity, Equity, and Inclusion

Diversity among the electrician, electrician helpers, cement masons and finishers occupations, Black / African American (3% of the workforce), Asian (1.7%), and American Indian / Alaskan Native (<1%) and women (3.6%) are underrepresented among the workforce. Retirements expected soon are at the national average.

Talent Pipeline

All three Kern CCD colleges offer education and training to prepare graduates for one or more of the carbon management and renewable energy occupations. Certificate and degree awards over the past five years in architecture / industrial drawing / AutoCAD programs; Construction management and technology; Electrician, Plumbing / Pipefitting and Sheetmetal apprentices; and Welding programs graduates.

KCCD: Energy Occupations	2017-18	2018-19	2019-20	2020-21	2021-22
Bakersfield College	144	139	108	58	138
Cerro Coso Community College	34	38	30	28	25
Porterville College		20	10	12	25
	178	197	148	98	188

Work-Based Learning

Bakersfield College, Cerro Coso Community College, and Porterville College have embedded work-based learning opportunities for its energy and construction certificate, pre-apprenticeship, and degree programs. The trades pre-apprenticeship programs lead to apprenticeship with journey electricians, cement masons, plumbers / pipefitters / steamfitters, sheet metal workers, and welders. In addition, BC, CCCC, and PC have student employment offices that provide student support for those seeking internships and employment.

Energy Industries: Top Emergent and Core Competencies

The following are the top emergent and core competencies for personnel working in clean transportation clean energy innovation and occupations across the energy sector.

Top Emergent Competencies:	
<p>Clean Transportation</p> <ul style="list-style-type: none"> ● Electric drive motor diagnostics and repair ● Regenerative braking diagnostics and repair ● Charging Station Communication Protocols OCPP, OCPI, Open ADR, OCP, OSCP, eMIP etc. ● Hydrogen Fueling Infrastructure 	<p>Clean Energy Innovation</p> <ul style="list-style-type: none"> ● SCADA Supervisory Control & Data Acquisition ● Data analytics ● Demand response incentives ● Utility bill reduction and optimization ● Islanding and grid resilience
Energy Industry Core Competencies	
<ul style="list-style-type: none"> ● Safety ● Electrical Safety – NFPA 70e Arc Flash protection ● Electrical line installation ● Direct current (DC) electricity ● Alternating current (AC) electricity ● Apprentice electrician ● Journeyman electrician ● Electrical contractor license 	<ul style="list-style-type: none"> ● Electric Vehicle Training Partnership Certification ● Crew leadership / supervision ● Report writing ● Troubleshooting ● Electrical repair ● Wiring ● Conduit bending ● Trade math

Emerging Opportunities

The following are pending and emerging opportunities available to address workforce needs in the energy industry.

Grant and Funding Opportunities Awaiting Approval

1. California Workforce Development Board - High Road Training Partnership Resilient Workforce Fund \$2.49 million – Awarded. Training will begin shortly: Clean Energy Workforce Readiness Training, Solar Installation Training, Zero Emission Vehicle Workforce Training, Microgrid Basics Training, Carbon Dioxide Reduction and Storage Basic Training.

2. Department of Energy – Vehicle Technologies Office \$1.25 million concept paper accepted. Full Application submitted 11/9/22. The South San Joaquin Valley Zero Emissions Vehicle Talent Pipeline #2/ The project expands the Talent Pipeline project. Adds hydrogen fueling infrastructure training.

3. Department of Energy – Vehicle Technologies Office \$1.1 million concept paper accepted. Full Application submitted 11/9/22. Community Clean Transportation Collaboratives. Project creates a tool kit and provides technical assistance to support disadvantaged communities develop clean transportation action plans.

4. Department of Energy – Solar Energy Technologies Office \$1.195 million concept paper. Awaiting feedback. Full Application submitted 12/6/22. The Solar Homes and Career for Justice40 Communities project provides solar installation and Electrical Apprenticeship Readiness training. Paid Hands-on experience installing Solar on Grid Alternatives or Habitat for Humanity homes and entrepreneurship training for those starting their own solar businesses.

5. Strategic Growth Council – Regional Climates Collaboratives (2023 Round) Helping disadvantaged communities develop climate and energy action plans. Provide technical assistance and resource tool kits to support state, federal and private resource development.

6. Department of Labor – Strengthening Community Colleges (2023 Round) The Strengthening California’s Climate Resilient Energy Workforce Project focuses on closing the worker supply gap and increasing employment equity among historically marginalized and excluded people of color and women while increasing program capacity and worker supply.

Additional Opportunities

1. Install CREL demonstration projects
2. Build Electric Vehicle Community Education Lab Trailer
3. Develop new associate degree program in Energy
4. Develop skills crosswalk between existing Oilfield Services workers and emerging Carbon Capture and Storage workforce needs
5. Develop Biomass Carbon Capture and Storage Project
6. Develop Agrivoltaics Demonstration Project
6. Analyze Hydrogen Energy Workforce and Economic Development Opportunities
7. Analyze Renewable Biofuels Workforce and Economic Development Opportunities

Defense and Aerospace Industry

One of the largest industries found in the Cerro Coso Community College (CCCC) service area is aerospace and defense. According to Hamilton, Keough, Ratnatunga, and Wong (2015), the aerospace and defense industry was listed in the top six industries of Kern County. Hamilton et al. stated that the aerospace and defense was ranked high because of its output, employment share, specialization, and growth. The three major aerospace and defense facilities served by CCCC are China Lake Naval Air Weapons Station (NAWS), Edwards Air Force Base (AFB), and Mojave Air and Space Port.

China Lake NAWS (China Lake)

According to the US Navy, “China Lake provides and maintains land, facilities, and other assets that support the Navy’s research, development, acquisition, testing, and evaluation (RDAT&E) of cutting-edge weapons systems for the warfighter” (para. 1). The Navy states that China Lake is the largest single land holding base. It represents 85% of the Navy’s RDAT&E. China Lake is located to the north and east of the City of Ridgecrest. The base is over 1.1M acres with two ordinance ranges. The US Navy reported the following team classifications at China Lake: military personnel (2% @ 192 personnel), Department of Defense Civilians (71% @ 5,727 personnel), and contractors (27% @ 2,236 personnel). The occupation groups used at China Lake are scientist and engineer (S&E), business and program management, technician specialist, S&E technician, administrative support, and federal wage system. The base hires approximately 317 personnel on average per year.

Edwards AFB (Edwards)

Edwards is home to the Air Force Test Center, Air Force Test Pilot School, and NASA’s Armstrong Flight Research Center. The base is in the southeast corner of Kern County. Edwards is the second largest Air Force base in the United States. According to the US Air Force (2022a), the population of Edwards is 11,457. Here is the population breakdown: active-duty Air Force personnel (2,207), Air Reserve and National Guard (37), civilian employees (4,302), contractors (2,265), associates and non-appropriated funds (NAF) (education) (229), private businesses (175), base exchange (138), and family members (2,104). US Air Force (2022b) reported the following civilian hot jobs at Edwards: computer scientist, budget analyst, IT specialist, computer engineer, recruitment and training manager, chief data officer, business and program managers, financial specialist, family advocacy treatment manager, police officer, training specialist, scheduler, engineer, aircraft maintenance, and electronics engineer.

Mojave Air and Space Port

The Mojave Air and Space Port is a 3,300-acre facility that includes an industrial park with over 70 transportation companies (Hamilton, Keough, Ratnatunga, and Wong, 2015). Some of the larger well-known organizations located at the airport and industrial park include The Spaceship Company, Masten Space Systems, Inc, Scaled Composites, LLC, Flight Test Associates, BAE Systems, Interorbital Systems, Capsed Limited, Firestar Technologies, Cambium, Stratolaunch, Northrop Grumman, Nexgen Aircraft Corporation, Incotec, Whittinghill Aerospace, and PPG Aerospace.

Current Defense & Aerospace Workforce Development Projects

1. **Defense and Aerospace Coalition** formed to address critical workforce needs in the local defense and aerospace sectors. Coalition partners include China Lake, Edwards, Mojave Air and Space Port,
2. **Workforce Development plans** developed for China Lake, Edwards, and Mojave Air and Space Port to assist each location with outreach, recruitment, community education, professional development, academic programs, apprenticeships, and K12 education.
3. **Bachelor's degree programs:** Development of a bachelor's degree program(s) universal to the aerospace and defense industry.
4. **Associate degree programs:** Development of new associate degree programs in areas relevant to data science, electrical engineering, and engineering fundamentals (for transfer to higher education).
5. **IT courses:** Development and implementation of noncredit courses in information technology linked to certifications.
6. **Professional Development:** Development of noncredit courses in professional development to align with aerospace and defense industry needs (e.g., CAMIO software training and/or certification).
7. **Apprenticeships:** Explore apprenticeship programs in machining, information technology, and engineering.
8. **K12 STEM:** Offer STEM summer academies and/or bootcamps to include K12 field trips that focus on military and aerospace topics.
9. **Dual Enrollment:** Expand STEM dual enrollment opportunities.
10. Promote and attend recruiting events that support the aerospace and defense industry.
11. Defense and Aerospace Summit

Workforce Supply Gaps

The Kern Community College District has been in extensive discussions with military personnel regarding their workforce needs over the past year. These discussions, surveys, and information provided identified unmet demand for specific technical skills. The team cross-walked these skills to likely occupations. These occupations will be validated by military and civilian partners in future discussions to ensure that we have correctly identified unmet workforce gaps critical for their respective operations. The following table lists the historical job numbers and projections based on current and prior year funding.

Table 1. Defense & Aerospace Workforce Supply Gaps

Occupation (1)	Jobs 2020 & 2030		2021 Openings	2020 Retirements	Median Wage
Aerospace					
Aerospace Engineers (17-2011)	638	717	37	166	\$111,238
Aerospace Engineering & Operations Technologists & Technicians (17-3021)	44	34	4	N/A	\$79,153
Engineering Technologists & Technicians, except drafters (17-3029)	845	715	71	183	\$80,721
Engineers, all other (17-2199)	737	744	47	184	\$120,081
Computer Science					
Computer Hardware Engineers (17-2060)	155	190	13	33	\$107,956
Network & Computer Systems Administrators (15-1244)	477	500	46	71	\$87,629
Computer Systems Analysts (15-1211)	600	637	57	114	\$95,143
Information Security Analysts (15-1212)	113	159	16	21	\$106,447
Electrical / Mechanical / Military					
Electrical & Electronic Engineering Technician (17-3023)	731	606	66	180	\$89,992
Industrial Machinery Mechanics (49-9041)	1,512	1,745	184	433	\$60,717
Military Only	2,688	2,908	343	N/A	\$34,083
Airline / Aircraft					
Airline Pilots, Copilots, & Flight Engineers (53-2012)	176	205	30	19	\$214,046
Aircraft Pilots & Flight Engineers (53-2010)	378	438	63	86	\$187,445
Aircraft Mechanics & Service Technicians (49-3011)	719	827	64	119	\$73,522
Geographic Area	Kern, Tulare, Inyo, and Mono Counties				

(Lightcast, 2023, Occupation Overviews)

Lack of Diversity and the Need for Diversity, Equity, and Inclusion

The racial and gender diversity in the listed occupations is not reflective of the broad community. Persons self-identifying as African American, Black, and Hispanic are underrepresented and White employees are overrepresented compared to the general population. Women are underrepresented in the engineering (26.7%), computer science (32%), and military (17.3%) workforce. (Lightcast, 2023.)

Talent Pipeline

Kern CCD programs in computer information systems, computer science, cyber security technology, data analysis, and engineering certificate and degrees awarded over the past five years. Awards include computer information technology, cybersecurity, engineering, and engineering-related technology certificates and degrees (Kern CCD IR Tableau, 2023).

KCCD: Computer & Engineering Awards	2017-18	2018-19	2019-20	2020-21	2021-22
Bakersfield College	108	117	63	78	152
Cerro Coso Community College	55	86	103	109	122
Porterville College	10	17	10	14	5
	173	220	176	201	279

Work-Based Learning

Work-based learning is embedded within computer and engineering certificate and degree programs, pre-apprenticeship, and apprenticeship programs. In addition, the student employment office works to find internships and employment opportunities for students and graduates.

Top Emergent and Core Competencies

In a recent meeting with the Department of Defense (US Air Force and US Navy) and China Lake Base Commander, several top emergent competencies and core competencies are noted. The following are the top emergent and core competencies for personnel working at the base:

Top Emergent Competencies: USAF, USN, China Lake: Base Employees	
<ul style="list-style-type: none"> ● Digital engineering ● Artificial intelligence / machine learning ● Embedded computing ● Model-based systems engineering (MBSE) ● Unified modeling language (UML) ● Computer Engineering / Advanced Software 	<ul style="list-style-type: none"> ● CAMIO ● Engineering tools ● Modeling language ● Radio frequency (RF) engineering ● Electrical Engineering
Core Competencies: USAF, USN, China Lake: Base Employees	
<ul style="list-style-type: none"> ● Systems engineering and integration. ● Electronic warfare ● Weapons aerodynamic analysis ● Propulsion technologies ● Energetics processing ● Mission systems engineering 	<ul style="list-style-type: none"> ● Project management ● Flight test engineering ● Embedded Software ● Weapons guidance and control systems ● Cyber security

Emerging Opportunities

Several federal and state grant proposals are under consideration and are in development to support the workforce needs of East Kern employers including the Mojave Air and Space Port (MASP) and Edwards Air Force Base. A National Science Foundation Engines 1 grant was submitted. Other opportunities include a 2024 CCCC CAI Information Technology grant.

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Kern Community College District

Workforce and Economic Development Roadmap

Roadmap Summary

Bakersfield College, Cerro Coso Community College, and Porterville College, and the Kern Community College District faculty, staff and administrators are prioritizing areas of large unmet workforce demand, significant climate change impacts or technology integration, and areas of focus for local and regional economic development and diversification. This section summarizes the goals and objectives by college over the five-year period (2023-2029) in each industry sector.

Healthcare

The existing Bakersfield College (BC), Cerro Coso Community College (CCCC), and Porterville College (PC) healthcare programs are mature. Over the next five years, BC, CCCC, and PC will address healthcare industries' workforce demand and supply gaps. Bakersfield College (BC) will be expanding its existing Registered Nurse (RN), Vocational Nurse (VN), Licensed Vocational Nurse to Registered Nurse (LVN to RN) programs and will implement Medical Assistant (MA) and specialty Behavioral and Mental Health programs. Cerro Coso Community College (CCCC) will implement Registered Nurse (RN) program pilot and seek Bureau of Registered Nursing (BRN) approval to establish a permanent RN program. Porterville College (PC) will expand its existing Registered Nurse Program. Each College will assess local demand each year to determine whether to seek approval for a cohort expansion or wait for the next assessment.

Energy

Energy programs have been an area of innovation as KCCD, BC, CCCC, and PC keep pace with state policy changes that are impacting the local renewable and traditional energy industries. Commercial scale solar and wind renewable energy facilities are located throughout the San Joaquin Valley of Kern County eastward through Tehachapi and Mojave. Traditional oil and gas fossil fuel energy industries are concentrated in western Kern County and companies located in Kern County also serve oil and gas fields on the central coast and south Los Angeles. KCCD, BC, CCCC, and PC are partnering with National Renewable Energy Laboratories and the US Department of Energy Fossil & Carbon Management to ensure new and existing workforce development programs feature workforce skills applicable to renewable energy, carbon storage and management, and emerging energy technologies.

Aerospace & Defense Industry

The Eastern Kern County aerospace and defense industry includes the Mojave Air and Space Port, the China Lake NAWS, and Edwards AFB. CC / KCCD faculty and administrators are working with civilian and military staff to support career awareness, and identify, develop, and deploy technical upskilling, and occupational certificate and degree programs to address workforce supply gaps in Engineering, Computer Science, Electrical, Mechanical, Military and

Airline/Aircraft occupations. Of these occupational areas, BC, CCCC, and PC's Computer and Engineering are mature programs with strong enrollment. Enhancements and expansion opportunities exist in developing courses to provide education in advanced software, artificial intelligence, machine learning, engineering, modeling, and programming languages, and other emergent and core competencies that East Kern employers report significant workforce supply gaps and incumbent worker technical skill gaps and needed upskilling.

Healthcare Industry Sector Roadmap

The existing Bakersfield College (BC), Cerro Coso Community College (CCCC), and Porterville College (PC) healthcare programs are mature. Over the next five years, BC, CCCC, and PC will address healthcare industries' workforce demand and supply gaps. Bakersfield College (BC) will be expanding its existing Registered Nurse (RN), Vocational Nurse (VN), Licensed Vocational Nurse to Registered Nurse (LVN to RN) programs and will implement Medical Assistant (MA) and specialty Behavioral and Mental Health programs. Cerro Coso Community College (CCCC) will implement Registered Nurse (RN) program pilot and seek Bureau of Registered Nursing (BRN) approval to establish a permanent RN program. Porterville College (PC) will expand its existing Registered Nurse Program. Each College will assess local demand each year to determine whether to seek approval for a cohort expansion or wait for the next assessment.

YEAR 1: 2023-2024			
GOAL: Expand Traditional Nursing Career-Path Programs			
BAKERSFIELD COLLEGE			
New / Enhanced Program(s)	Activity	Outcome	Quarter
LVN, LVN to RN, & RN Programs	Recruit clinical sites. Recruit and train clinical instructors.	Increase # of clinical sites & instructors.	
	Implement BRN approved increased enrollment.	Increased LVNs and RNs meet local and regional demand	
	Implement hybrid modalities: Part-time evening, and employer-sponsored programs.	Increased LVNs and RNs meet local and regional demand	
CERRO COSO COMMUNITY COLLEGE			
New / Enhanced Program(s)	Activity	Outcome	Quarter
RN Pilot	Recruit clinical sites. Recruit and train clinical instructors.	Increased LVNs and RNs meet local and regional demand	
	Implement RN pilot program. Online modality. Participate in BRN review. Petition for program authorization.		
PORTERVILLE COLLEGE			
New / Enhanced Program(s)	Activity	Outcome	Quarter
RN Program	Recruit clinical sites. Recruit and train clinical instructors.	Increased LVNs and RNs meet local and regional demand	
	Implement BRN approved increased enrollment.	Increased LVNs and RNs meet local and regional demand	

YEAR 1: 2023-2024			
GOAL: Implement Behavioral & Mental Health Programs			
BAKERSFIELD COLLEGE			
New / Enhanced Program(s)	Activity	Outcome	Quarter
Medical Assistant (MA) Program	Complete curriculum approval process. Implement hybrid modality MA program.	Address employer demand for medical assistants.	
Behavioral and Mental Health Programs	Recruit clinical sites. Recruit & train Behavioral & Mental Health Programs	Funding is acquired, programs are implemented in 2023-2024 or 2024-2025	

YEAR 2: 2024-2025			
GOAL: Implement New Specialty Care Professionals Programs			
BAKERSFIELD COLLEGE			
New / Enhanced Program(s)	Activity	Outcome	Quarter
Behavioral and Mental Health Programs	Implement Behavioral and Mental Health programs	Address demand for behavioral health and mental health workers	
RN Program	Assess student cohort size versus labor market need.	Either request cohort increase or defer 1 year.	
CERRO COSO COMMUNITY COLLEGE			
New / Enhanced Program(s)	Activity	Outcome	Quarter
RN Program	Seek BRN approval for permanent RN program	RN program approved	
PORTERVILLE COLLEGE			
New / Enhanced Program(s)	Activity	Outcome	Quarter
RN Program	Assess student cohort size versus labor market need.	Either request cohort increase or defer 1 year.	

YEAR 3: 2025-2026			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
All New & Existing Programs	Conduct Healthcare Program Evaluation	Update course content and make cohort size adjustments.	

YEAR 4: 2026-2027			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
All New & Existing Programs	Conduct Healthcare Program Evaluation	Update course content and make cohort size adjustments.	

YEAR 5: 2027-2028			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
All New & Existing Programs	Conduct Healthcare Program Evaluation	Update course content and make cohort size adjustments.	

Energy Industry Sector Roadmap

Energy programs have been an area of innovation as KCCD, BC, CCCC, and PC keep pace with state policy changes that are impacting the local renewable and traditional energy industries. Commercial scale solar and wind renewable energy facilities are located throughout the San Joaquin Valley of Kern County eastward through Tehachapi and Mojave. Traditional oil and gas fossil fuel energy industries are concentrated in western Kern County and companies located in Kern County also serve oil and gas fields on the central coast and south Los Angeles. KCCD, BC, CCCC, and PC are partnering with National Renewable Energy Laboratories and the US Department of Energy Fossil & Carbon Management to ensure new and existing workforce development programs feature workforce skills applicable to renewable energy, carbon storage and management, and emerging energy technologies.

YEAR 1: 2023-2024			
BAKERSFIELD COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
Energy, HVAC, Welding, and other traditional energy skills related programs	Industry Advisory stakeholders' input	Update programs carbon management knowledge & skills as carbon management	
Energy & Carbon Management: Emerging Workforce knowledge & skills	Participate in the DAC Hub and the Hydrogen Shot Partnerships	Identify emerging workforce knowledge & skills important to traditional students and incumbent worker upskilling	
Energy & Carbon Mgmt: Emerging Workforce knowledge & skills	BC, CCCC, PC advisory stakeholders identify local workforce needs.	Develop and design curricular modules, courses or programs needed by employers.	

YEAR 2: 2024-2025			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
EV Electrification: expand modules to Auto / Truck / Mechanics programs	Complete curriculum modules or components	Integrate installation of EV charging stations,	
Energy & Carbon Mgmt: Emerging Workforce knowledge & skills	Participate in the DAC Hub and the Hydrogen Shot Partnerships	Identify emerging workforce knowledge & skills important to traditional students and incumbent worker upskilling	
Energy & Carbon Mgmt: Emerging Workforce knowledge & skills	BC, CCCC, PC advisory stakeholders identify local workforce needs.	Develop and design curricular modules, courses or programs needed by employers.	

YEAR 3: 2025-2026			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
Energy & Carbon Mgmt: Emerging Workforce knowledge & skills	Participate in the DAC Hub and the Hydrogen Shot Partnerships	Identify emerging workforce knowledge & skills important to traditional students and incumbent worker upskilling	
Energy & Carbon Mgmt: Emerging Workforce knowledge & skills	BC, CCCC, PC advisory stakeholders identify local workforce needs.	Develop and design curricular modules, courses or programs needed by employers.	

YEAR 4: 2026-2027			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
Identify key emerging energy workforce demand in each college service area.	Develop modules, courses, and programs to address local needs.	Address local and regional workforce knowledge and supply / demand gaps	
Energy & Carbon Mgmt: Emerging Workforce knowledge & skills	BC, CCCC, PC advisory stakeholders identify local workforce needs.	Develop and design curricular modules, courses or programs needed by employers.	

YEAR 5: 2027-2028			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
Identify key emerging energy workforce demand in each college service area.	Develop modules, courses, and programs to address local needs.	Address local and regional workforce knowledge and supply / demand gaps	
Energy & Carbon Mgmt: Emerging Workforce knowledge & skills	BC, CCCC, PC advisory stakeholders identify local workforce needs.	Develop and design curricular modules, courses or programs needed by employers.	

Aerospace & Defense Industry Sector Roadmap

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YEAR 1: 2023-2024			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
Aerospace & Defense (all)	Prioritize & implement upskilling opportunities	Address technical skills gaps that address employers' needs	
Aerospace & Defense: Electrical, Mechanical, Engineering, and Computer Science programs	Develop, revise, and expand existing high priority certificate and degree programs	Ensure mid- and long-term high priority workforce shortages are addressed as soon as possible.	

YEAR 2: 2024-2025			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
Aerospace & Defense (all)	Implement high priority technical upskilling	Address technical skills gaps that address employers' needs	
Aerospace & Defense: Electrical, Mechanical, Engineering, and Computer Science programs	Prioritize, develop, revise / expand existing high priority certificate and degree programs	Ensure mid- and long-term high priority workforce shortages are addressed as soon as possible.	
Aerospace & Defense (all)	Develop K12 career awareness, K12 STEM, summer academies & bootcamps	Cultivate student awareness, interest, and enrollment in aerospace and defense career programs	

YEAR 3: 2025-2026			
BAKERSFIELD COLLEGE / CERRO COSO COMMUNITY COLLEGE / PORTERVILLE COLLEGE			
New / Existing Program	Activity	Outcome	Quarter
Aerospace & Defense (all)	Implement high priority technical upskilling	Address technical skills gaps that address employers' needs	
Aerospace & Defense: Electrical, Mechanical, Engineering, and Computer Science programs	Prioritize, develop, revise / expand existing high priority certificate and degree programs	Ensure mid- and long-term high priority workforce shortages are addressed as soon as possible.	
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New / Existing Program	Activity	Outcome	Quarter
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