

Putting California on the High Road: A Jobs and Climate Action Plan for 2030

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Executive Summary

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I. Introduction

Over the last 15 years, California has emerged as a national and world leader in the fight to avoid climate disaster, passing a comprehensive and evolving suite of climate measures to accelerate the transition to a carbon-neutral economy. The state has also emerged as a national leader in embracing economic equity as a goal for state policy, charting a path towards a new social compact for shared prosperity in a rapidly changing world.¹ Meaningful commitment to both of these goals—ensuring that all Californians thrive in the transition to a carbon-neutral economy—requires the development and implementation of a bold agenda that aligns California’s ambitious climate and workforce action plans. This report presents a framework for California to advance that agenda.

Assembly Bill 398 (E. Garcia, Chapter 135, Statutes of 2017) required that the California Workforce Development Board (CWDB) present a report to the Legislature on strategies “to help industry, workers, and communities transition to economic and labor-market changes related to statewide greenhouse gas emissions reduction goals.”² To fulfill this mandate, the CWDB commissioned the Center for Labor Research and Education at the University of California, Berkeley, to review the existing research in the field and prepare this report. The summary presented here describes the key concepts, findings, and recommendations contained in UC Berkeley’s full work.

The statutory language of AB 398 makes clear that this report should address workforce interventions to ensure that the transition to a carbon-neutral economy:

- **Creates high-quality jobs;**
- **Prepares workers with the skills needed to adapt to and master new, zero- and low-emission technologies;**
- **Broadens career opportunities for workers from disadvantaged communities; and**
- **Supports workers whose jobs may be at risk.**³

This report presents a comprehensive strategy that identifies roles for state and local climate, economic development, and workforce development agencies in achieving these goals, alongside key partners such as business, labor, community, and education and training institutions. All recommendations align with the CWDB’s Unified Strategic Workforce Development Plan, which has put forth a set of actions to leverage and coordinate the state’s myriad workforce and education programs to support high-quality careers for Californians.⁴ In keeping with the statutory directive, the report discussion is further enriched by comments provided to the CWDB through a series of stakeholder meetings held in July and August 2018.⁵



This report builds upon the framework established in California's 2017 Climate Change Scoping Plan (Scoping Plan),⁶ which presents a roadmap of policies and programs to reach the climate protection target in Senate Bill 32 (Pavley, Chapter 42, Statutes of 2016) of a 40 percent reduction in greenhouse gas emissions by 2030 from 1990 levels. The Scoping Plan is organized into sectors based on the state's major sources of greenhouse gas emissions and corresponding climate action measures: Transportation, Industry, Energy, Natural and Working Lands (including Agricultural Lands), Waste, and Water.⁷

This report organizes the available information from existing academic research, economic models, and industry studies for the Scoping Plan sectors and presents for each of them:

- Information about current labor conditions and the impact on jobs of the major climate measures;
- Guidance for policymakers, agencies, and institutions that implement climate and/or workforce policy on how to best generate family-supporting jobs, broaden career opportunities for disadvantaged workers, deliver the skilled workforce that employers need to achieve California's climate targets, and protect workers in declining industries; and
- Examples of concrete, scalable strategies that have connected effective climate action with workforce interventions to produce good outcomes for workers.

II. The High-Road Framework

California has demonstrated that it is viable to reduce greenhouse gas emissions and have economic growth concurrently.⁸ The California Air Resources Board (CARB) used economic modeling to estimate that in 2030 there will be at most a 0.3 percent difference in job growth when comparing scenarios with or without climate policy—essentially, no net job loss.⁹ This cost is minuscule compared to recent projections of the cost of not mitigating climate change, reported in the federal government's Fourth National Climate Assessment, which predicts severe disruptions to the economy if climate action is not taken.¹⁰

However, maximizing **shared** prosperity for California's working families from these transformations requires specific and intentional labor policy.¹¹ Workers will experience changes unequally; some good jobs will disappear, and, without policy intervention, they could be replaced by low-wage jobs.¹² This outcome has implications not only for the broader economy, but also for the climate policies themselves. Research shows a strong relationship between the quality of work done on renewable energy system installation,



for instance, and the ability of those systems to perform at a level where they actually reduce greenhouse gas emissions.¹³ In energy efficiency projects, this relationship is especially clear, as the energy savings from efficiency projects come largely from the operation of those systems, not simply from their installation. As a result, skilled, trained workers involved in system installation, maintenance, and operations are a key part of the state's overall greenhouse gas emission reduction strategy.¹⁴

In addition, absent deliberate efforts to incorporate workforce goals, the economic changes produced by climate policy may simply replicate—or even exacerbate—deep-seated economy-wide trends of persistent wage inequality and disparities by race and gender.¹⁵ This report starts with the premise that California climate policy can and should generate safe, family-supporting career-track jobs; broaden job opportunities for workers from disadvantaged communities; and contain supports for workers and communities in carbon-intensive industries at risk of decline due to climate policy. This premise is consistent with the Scoping Plan, which notes that “the implementation of California’s climate change goals provides great opportunity to not only improve the habitability of the planet, but also to increase economic vitality [and] employ historically disadvantaged people in secure jobs.”¹⁶

As the report shows, there already exist feasible, road-tested workforce and economic development mechanisms that are complementary to climate policy, and that can be utilized to improve outcomes for workers. Successful examples from the workforce policy arena make clear that achieving strong workforce goals requires going beyond job numbers, and to focus as well on job quality and job access.

Job Quality

While the specifics will vary by sector and occupation, there is general agreement that a good, family-supporting job pays a living wage; offers a stable schedule; provides benefits such as health care, retirement, paid sick days, and paid family leave; offers wage increases as skills are acquired; provides safe and healthy working conditions; and complies with all workplace laws (e.g., wage and hour, employee classification, health and safety, anti-discrimination, workers’ compensation, and right to organize laws).¹⁷

Job Access

Historical patterns of discrimination and institutional racism have led to concentrations of people of color and women in low-wage and often unhealthy or dangerous jobs.¹⁸ Job access and inclusion entails ensuring that the job opportunities generated from the growth of the carbon-neutral economy are accessible to workers who reflect the diversity of the state's population. Efforts to broaden inclusion must always be coupled with attention to job quality, and vice versa, or they will simply maintain the status quo, with



workers of color concentrated in the bottom of the labor market. California uses a variety of criteria to identify and include disadvantaged workers, including the CalEnviroScreen tool,¹⁹ which has been developed to identify communities at the census tract level that bear disproportionate burdens of environmental degradation and economic marginalization.

Job Numbers

This report uses available information from economic models and industry studies for each of the critical sectors identified in the Scoping Plan to assess relative job growth in sectors affected by climate policy. It is not, however, a quantitative analysis of the job impacts of the 2030 Scoping Plan or of the over 100 climate policies and programs on which it is based. As mandated in AB 398, this a strategy document with concrete recommendations for the legislature and the administration on labor policies and actions that can complement climate policy. Effective labor market analysis that informs planning for workforce development—and identifies opportunities to improve job quality and job access—requires combining labor market information with deep on-the-ground knowledge for each sector, industry, and set of occupations, and is most effectively carried out within the context of industry training partnerships at the regional level.

What is the High Road and How Do We Build It?

Optimizing climate policy outcomes while supporting the creation of and access to family-supporting jobs is a “high-road” approach to economic development. As the term is used here, a high-road economy supports businesses that compete on the basis of the quality of their products and services by investing in their workforces; these businesses pay the wages and benefits necessary to attract and retain skilled workers, who in turn perform high-quality work.²⁰ Building the high road requires interventions on both the demand side and the supply side of the labor market. Supply indicates workers and the institutions that train them; demand refers to jobs and the firms or institutions that offer them.

Demand-Side Strategies

Demand-side strategies affect the demand for labor, including the kinds of jobs that are generated, the skills that are needed, the wages and benefits employers provide, and who employers hire.²¹ Public policy can encourage improvements in job quality through industry-specific or economy-wide wage and benefit standards, such as prevailing, living, and minimum wages; skill certification requirements; enforcement of all labor and employment laws, including proper classification of employees; and collective bargaining



rights. Better wages, benefits, working conditions, and career ladders support a more skilled workforce, which in turns leads to better design, installation, operation, and maintenance of technologies.²² These policies support the high-road employers within an industry and help them attract and retain a skilled workforce by limiting competition based on low wages.²³ Demand-side policies also include interventions to increase hiring of qualified workers from disadvantaged communities and to ensure that labor standards do not create barriers for historically excluded groups. Finally, public policy can support industry and business growth that will lead to high-road job availability, so that workers are trained for jobs that actually exist.

Demand-side strategies, like wage standards, skill certification requirements, or community workforce agreements, can be incorporated into climate measures through policy, regulatory action, or program design. Agencies responsible for implementing climate investments and other measures play a key role here because they direct public investment and influence private investments in lower carbon economic activity.

AB 398 specifically calls for this report to focus on opportunities to use project labor agreements (PLAs), community workforce agreements (CWAs), and community benefits agreements (CBAs).²⁴ These are all well-tested demand-side strategies that have been used in particular instances but have not yet been systematically applied across low-carbon investments.²⁵ PLAs are pre-hire collective bargaining agreements unique to the construction industry that set wage and benefit standards.²⁶ Although terminology varies, CWAs, as defined in this report, are PLAs that also include goals and processes for hiring from local communities or targeted disadvantaged groups.²⁷ CBAs are legally enforceable agreements negotiated between community groups and a developer or employer, and require specified local benefits, in some cases related to job quality and hiring goals, to maximize the economic development benefits of public assets and/or investments.²⁸

Supply-Side Strategies

Supply-side strategies focus on preparing the workforce for current and future changes in the labor market that are the expected result of climate policy and the overall transition to a carbon-neutral economy. Supply-side strategies are the traditional purview of the state's workforce development community, which is made up of an interconnected set of institutions including the community college and four-year college systems, certified apprenticeship programs, nonprofit training organizations, labor-management partnerships, public workforce development agencies, and multiple state, county and municipal agency partners. This system of education and training is funded through a variety of state and federal funding sources.²⁹

For workers, training is valuable if it leads to skill development, job placement, and wage and career advancement; for employers, training is valuable if it leads to improved



productivity and work quality.³⁰ Public funding for training will be effective only if trained workers are hired and retained, making it critical to target public training investments toward high-road employers who see their workforce as a worthwhile investment rather than a cost to be minimized.³¹

Workforce development is essential to building economic opportunity for those who have been marginalized, disadvantaged, and otherwise denied opportunities. Programs targeted to disadvantaged workers can secure more equality in the distribution of job opportunities, but the shortage of good jobs is an ongoing challenge for these pipeline programs. *To improve outcomes for workers in low-wage jobs, the most effective strategies are those that build skills, respond to employer needs, and improve job quality, simultaneously.*³²

In line with the CWDB's strategic plan, best-practice workforce development emphasizes training that:³³

- Responds to actual labor market demand by partnering closely with industry;
- Supports the state's high-road employers and pays attention to job quality;
- Emphasizes broad skill training for an occupation rather than just for one technology;
- Leverages the state's existing workforce education and training infrastructure rather than creating boutique programs unconnected to workers' education and career trajectories; and
- Assesses success of training based on outcomes, including job placement rates and improvements in wages and benefits improvements, higher worker productivity, and ongoing commitments by employers.

Just Transition Strategies

"Just Transition" refers to integrated policy approaches offering protection, support, and compensation for displaced workers and communities in specific industries or regions. This issue often arises in resource-intensive regions that lack overall economic diversity, when the region's major industry is or is projected to be in decline due to the resource itself running out, or more broadly due to global trends in automation, globalization, and climate change. Just transition programs can offer resources for both immediate short-term assistance to workers and communities directly affected by these trends, and long-term assistance to communities and workers as they "retool" and adapt to a carbon-neutral economy.³⁴ These strategies can also incorporate economic development planning, to help regions better identify the most promising emerging new industries based on regional assets including geography, educational and research institutions, and existing workforce skills.



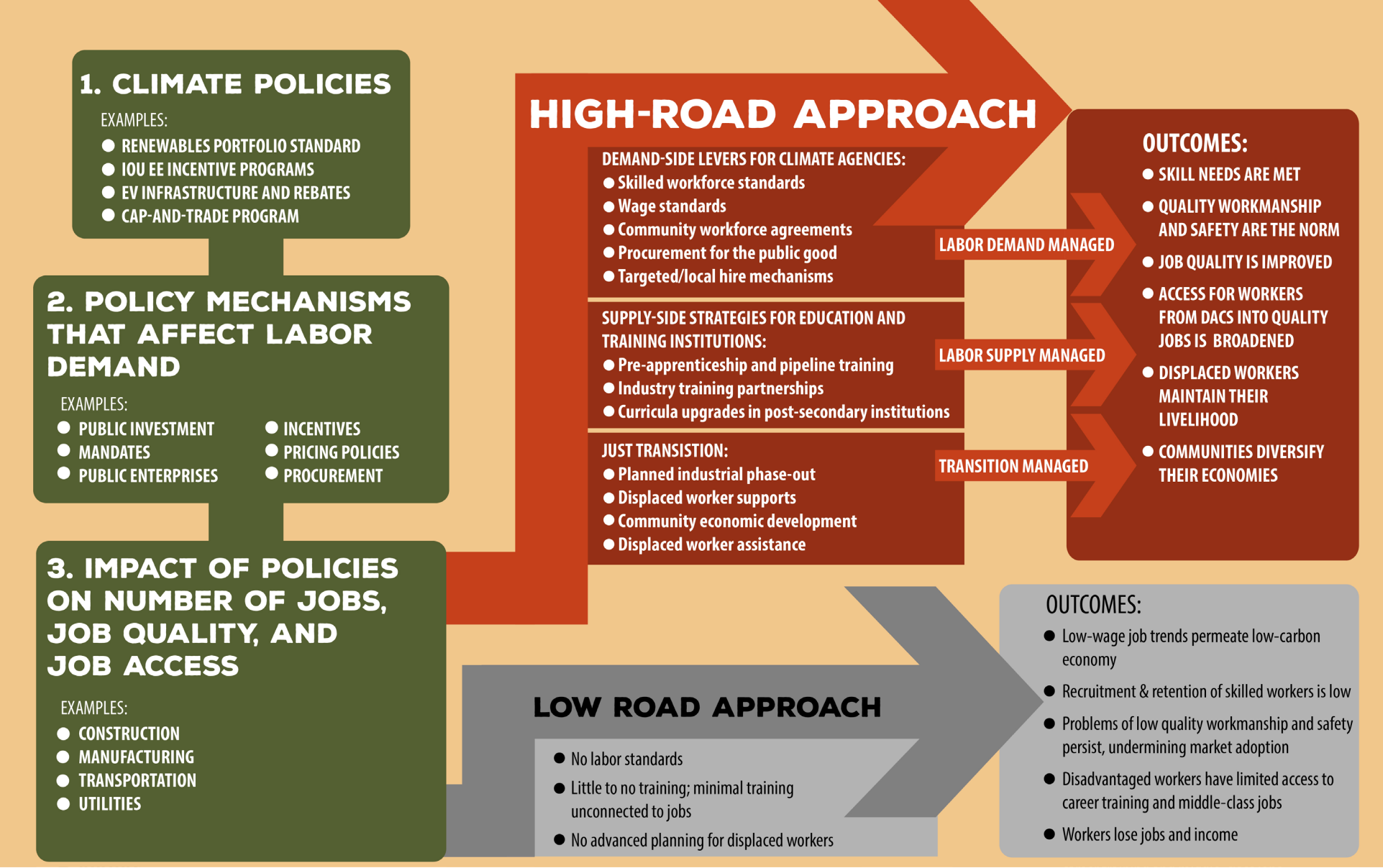
Choosing the High-Road Approach

The comprehensive and proactive supply-side and demand-side approach described above differs significantly from the standard approach to delivering skills to meet the needs of the climate transition. This more conventional approach relies *only* on supply-side strategies and assumes that as long as there are good training programs for new low-emission technologies, and that these have sufficient funding, the problem is solved. Proponents of this view have supported funding new short-term training programs aimed at new “green jobs,” or specific clean energy technologies or sectors. However, research has shown that simply funding more training—particularly short-term, technology-specific training—does not necessarily help workers.³⁵ Training does not create jobs or ensure job placement for graduates.³⁶ To be effective, training strategies must connect directly to the labor market, explicitly addressing industry needs and connecting participants to actual jobs.³⁷ The CWDB’s comprehensive approach to workforce development—as exemplified by its High Road Construction Careers and High Road Training Partnership initiatives—integrates demand- and supply-side strategies, avoiding the pitfalls of niche “green jobs” training and ensuring that California workers are prepared for long-term careers in a rapidly-evolving, carbon-constrained economy.

Exhibit ES.1 presents the conceptual framework illustrating the alignment of climate and workforce action plans. It starts with (1) examples of climate measures that use (2) a variety of specific policy mechanisms, and have (3) impacts on the number of jobs, job quality, and who is hired in the key industries affected by each climate measure. Without specific demand-side and supply-side labor interventions, these job impacts will replicate current trends and practices in the labor market, which in some sectors will simply reproduce low wages and ethnic and gender disparities. The graphic illustrates two distinct choices: a low-road approach that does not incorporate workforce strategies (in gray), and a high-road approach that manages changes in the labor market using the strategies recommended in this document (in red).



Exhibit ES.1. Conceptual Framework



III. Scoping Plan Sectors

The California Air Resources Board maintains an inventory of greenhouse gas emissions. Using 2017 data and following the Scoping Plan categorization, the descriptions below address the main sources of greenhouse gas emissions for each Scoping Plan sector and the primary strategies aimed at reducing those emissions.³⁸

❖ **Transportation (40.1 percent of California's greenhouse gas emissions)**

This sector covers the greenhouse gas emissions from a wide range of vehicles and equipment used to move people and freight, including on- and off-road mobile sources of pollution (e.g., cars, trucks, locomotives, ships, aircraft, and other cargo-handling equipment). The three primary strategies to reduce greenhouse gas emissions from the transportation sector are: replacing conventional vehicles and equipment with zero- and near-zero-emission options; lowering the carbon intensity of transportation fuels; and reducing the number of vehicle miles traveled.

❖ **Industrial (25.8 percent of California's greenhouse gas emissions)**

This sector covers the emissions from major emission-intensive production facilities, including oil refineries, cement, food processing, paper products, metals, and others; the sector includes oil and gas production. A key strategy is the Cap-and-Trade Program, which puts a price on greenhouse gas emissions and allows industry to determine the least cost method of reducing emissions. Other strategies include regulations to require fuel switching, energy efficiency improvements, and modifying industrial processes, as well as incentives. The manufacturing of lower-carbon products that can substitute for emission-intensive products is also addressed in the chapter of this report about the industrial sector. Emissions of high global warming potential (high-GWP) gases, like refrigerants, are mostly counted in the industrial sector. High-GWP gases are a growing emission source and can be lowered by reducing leaks and by shifting to alternatives with lower global warming potential.

❖ **Energy (24.4 percent of California's greenhouse gas emissions)**

This sector covers the greenhouse gas emissions from the generation of electricity (in-state and imported) and the consumption of electricity and thermal energy in residential and commercial buildings. The primary strategies to reduce greenhouse gas emissions from the energy sector are: switching from fossil fuels to renewable



energy sources, and conserving energy and improving efficiency in residential and commercial buildings (industrial energy efficiency and water efficiency are addressed in the industry and water chapters, respectively).

❖ **Natural and Working Lands (7.6 percent of California’s greenhouse gas emissions, Agriculture only)**

This sector includes emissions from livestock, crop growing and harvesting, and other general fuel use by agriculture. Strategies and initiatives are in place to capture methane from dairies and other animal husbandry, improve crop production techniques and soil health for carbon capture, and reduce emissions from farm operations. This sector also covers California’s forests and other wildlands, as well as urban parks and greenspace; these emissions have not yet been quantified and are not included in the 7.6 percent above. Forest management and fire protection strategies to minimize black carbon emissions and increase carbon capture and sequestration are currently in development, as are incentives to promote healthy soils, rehabilitate wetlands and tidal environments, and promote greater adoption of land conservation practices.

❖ **Waste (2.1 percent of California’s greenhouse gas emissions)**

This sector covers the emissions from landfills and other waste treatment facilities. Strategies to reduce emissions from the waste sector involve: diverting waste from landfills to other types of facilities (recycling, composting, reuse, and re-manufacturing); reducing solid waste generation (through packaging reduction and edible food rescue/recovery efforts); and capturing methane emissions from waste facilities to generate energy.

❖ **Water (emissions accounted for within other sectors)**

This sector covers the emissions from the “water-energy nexus”—power consumed to heat and cool water in residential and commercial buildings and for industrial processes, and power needed for water conveyance, treatment, and distribution. Strategies to reduce emissions from the water sector include: water conservation and efficiency; use of renewable energy in major water operations; and deployment of lower carbon technologies for water treatment and groundwater remediation and recharge.



IV. Findings: The Impact of Climate Policy on Job Quality and Job Access

❖ Analysis of climate policy implementation shows the outsized importance of the construction industry and the predominance of blue-collar work.

Exhibit ES.2 is a summary table of the industries and occupations associated with each Scoping Plan sector. It illustrates two findings that shape the analysis and recommendations: the predominance of blue-collar work and the importance of the construction industry in the Scoping Plan sectors.

The information in **Exhibit ES.2** is derived by identifying the main activities impacted by climate policy, linking them to industries as defined by the Bureau of Labor Statistics (BLS) at the most disaggregated level possible, and identifying the occupational distribution of each industry. Some Scoping Plan sectors, like waste and water, are narrowly focused on one industry as defined by the BLS, but others, like sustainable transportation, affect multiple industries, e.g., manufacturing, trucking, transit, and construction.

Exhibit ES.2. Scoping Plan Sector, Subsector, Industry, and Percent Blue-Collar Employment

Scoping Plan Sector	Subsector	Industry by NAICS	% Blue-Collar Jobs
Energy	Utility-Scale Renewables—Construction	Utility System Construction	78%
	Utility-Scale Renewables—Operations	Electric Power Generation, Transmission and Distribution	38%
	Distributed Generation	Residential Building Construction	69%
		Nonresidential Building Construction	59%
	Energy Efficiency	Residential Building Construction	69%
		Nonresidential Building Construction	59%
	Natural Gas Leakage Abatement	Natural Gas Distribution*	42%



Scoping Plan Sector	Subsector	Industry by NAICS	% Blue-Collar Jobs
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing	87%
		Automotive Repair and Maintenance	78%
	Trucking	Truck Transportation	77%
	Public Transit	Transit and Ground Passenger Transportation	83%
	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation	75%
	Transit Infrastructure	Other Heavy and Civil Engineering Construction	76%
	Infill and Transit-Oriented Development	Residential Building Construction	69%
		Nonresidential Building Construction	59%
Industry	Emissions Intensive Manufacturing	Various*	58%**
	Fossil Fuel Production, Refining, and Distribution	Oil and Gas Extraction	41%
		Petroleum and Coal Products Manufacturing	55%
		Pipeline Transportation	63%
	Emissions and Leakage Abatement	Other Specialty Contractors	79%
	Electrification	Electrical Contractors and Other Wiring Installation	75%
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services	76%
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems	58%
		Utility System Construction	78%
		Remediation and Other Waste Management Services	72%



Scoping Plan Sector	Subsector	Industry by NAICS	% Blue-Collar Jobs
Natural and Working Lands	Forestry Services, Fire Prevention and Suppression	Forestry and Logging	90%
	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing and Hunting	96%
	Wetlands Restoration, Urban Greening, etc.	Various*	N/A

Notes:

* Detailed occupation profile of this industry is not available.

** Employment-weighted average of proportions of blue-collar workers within the NAICS industries listed as eligible for receiving allowances under the Cap-and-Trade Program Vintage 2018 Allowance Allocation. See California Air Resources Board, “Cap-and-Trade Program: Vintage 2018 Allowance Allocation,” December 5, 2017, <https://ww3.arb.ca.gov/cc/capandtrade/allowanceallocation/v2018allocation.pdf>.

Source: May 2016 OES Research Estimates by State and Industry [https://www.bls.gov/oes/current/oes_research_estimates.htm]

Construction is the most significant industry in the expansion of utility-scale and distributed renewable energy generation, energy and water efficiency retrofits in the built environment, cleaner fuels infrastructure, infill and transit-oriented development, water infrastructure, infrastructure for waste energy capture, and the installation of emissions reductions technologies in refineries and leakage abatement in oil and gas production and distribution. Construction constitutes 54 percent of the expenditures from the Greenhouse Gas Reduction Fund (GGRF) to California Climate Investments (CCI) due to investments in high-speed rail, public transit system infrastructure, and affordable multi-unit housing.³⁹ Other key industries in **Exhibit ES.2**, such as manufacturing, utilities, and forestry services, are also critical; still, collectively, they comprise a limited slice of the California economy. The largest employment sectors of our economy—including healthcare, education, hospitality, and retail—make little appearance in the Scoping Plan, except as the subject of energy efficiency measures (carried out by construction and building operation activities) to lower energy and water use in the buildings they occupy. They are indirectly affected by changes in electricity and fuel prices but remain relatively untouched otherwise, showing that impacts of the climate policy explored in this report are concentrated in a limited number of industries and jobs.



Exhibit ES.2 also illustrates the predominance of blue-collar work—defined as occupations in construction, production, transportation, maintenance, repair, and similar occupations—in the industries that are most directly affected by climate policy.⁴⁰ The jobs tied to the production of fossil fuels, which are most likely to decline with the long-term transition to a carbon-neutral economy, are also largely blue collar. In contrast, the share of blue-collar occupations in the California economy as a whole is only 23 percent.⁴¹

The term “blue collar” does not mean low-skilled. Many blue-collar workers must gain sophisticated skills to carry out their jobs, and these workers increasingly perform technical and computer-related tasks.⁴² The predominance of these occupations among the industries affected by climate policy highlights the importance of workplace-based training and industry partnerships, since many of these workers are not required to have postsecondary education.⁴³

The predominance of blue-collar workers also underscores the importance of marrying climate investments to workforce strategies that promote job quality. The quality of blue-collar jobs varies tremendously, even within the same industry, depending on the degree of subcontracting and outsourcing, ease of employment law enforcement, unionization rates, and other factors.⁴⁴ These differences in job quality within industries and between high and low road employers are often difficult to discern from government data, which also is not able to capture wage theft and other employment violations.⁴⁵

Professional occupations, defined here as engineering and other technical occupations that mostly require a four-year college degree, are also critical for the design and planning of low-emission technologies. Jobs requiring a college degree generally pay family-supporting wages and provide workers with a return on their investment in education.⁴⁶ These can provide important career mobility paths for workers from disadvantaged communities, but they are much more limited in number than blue-collar jobs.

❖ **Lowering greenhouse gas emissions involves traditional occupations that incorporate new tasks, rather than new and different jobs.**

Research and practice have confirmed that it is more accurate to talk about “greening” existing jobs, rather than new and different “green jobs.” The vast majority of the jobs that will be involved in work to lower greenhouse gas emissions across the economy are in traditional occupations where specific “low carbon” knowledge and skills are only one component of a broader occupational skill set.⁴⁷ A comprehensive study of energy efficiency programs found that approximately two-thirds of the jobs generated directly by energy efficiency investments in California are in traditional building and construction trades—e.g., electricians, sheet metal workers, plumbers, carpenters, stationary



engineers, and others. Only around one-sixth are in professional occupations, and only 2 percent are specialized energy efficiency occupations like energy auditor (and even then, auditors often perform other tasks unrelated to energy savings).⁴⁸ Likewise, mechanics for zero-emissions vehicles are still motor vehicle mechanics and workers who manufacture electric cars are still autoworkers, even though they incorporate new skills and tasks for engines that do not run on fossil fuels. In other words, there are very few new occupations created by climate mitigation activities, but instead new aspects to old occupations. This finding helps confirm that niche training programs targeting a particular low-emission technology, such as training for solar panel installation, are less effective than broader training that helps workers gain mastery in an occupation and provides them with skills to continually adopt improved and cleaner technologies.⁴⁹

❖ **Many activities that reduce greenhouse gas emissions are creating good jobs and broadening opportunities for disadvantaged workers.**

➤ **Utility-Scale Renewable Energy Generation**

A major success story is the build-out of utility-scale renewable energy generation (solar energy primarily) facilities in California, driven in large part by the state's Renewables Portfolio Standard (RPS).⁵⁰ The RPS has resulted in steep declines in greenhouse gas emissions in the electricity sector—which accounts for most of the greenhouse gas reductions to date⁵¹—and has produced family-supporting jobs and employed workers from some of the poorest counties in the state.⁵²

Almost all utility-scale renewable generation projects have been built under project labor agreements (PLAs), and some have been built under community workforce agreements (CWAs).⁵³ Under both PLAs and CWAs, the construction of utility-scale renewables in California has produced family-supporting, union scale wages and benefits while also appreciably boosting the inclusion of workers from disadvantaged communities. The use of apprentices, a key feature of PLAs and CWAs, ensures training and a career ladder.⁵⁴

➤ **High Speed Rail and Major Transit Capital Projects**

The proceeds from state auctions of greenhouse gas emission allowances under the Cap-and-Trade Program are deposited into the Greenhouse Gas Reduction Fund (GGRF) and appropriated by the Legislature to California Climate Investments (CCI) programs that reduce greenhouse gas emissions and advance additional environmental, economic, and public health benefits. In some cases, CCI programs produce good jobs and create opportunities for disadvantaged workers. This is especially true of large-scale construction projects, but never happens automatically.



Because the GGRF is a state fund, most construction activities are covered by prevailing wages, ensuring family-supporting jobs, and the High Speed Rail project and many transit infrastructure investments are built under CWAs, which create access to employment opportunities for targeted populations of workers (e.g., workers from specific locales and/or socioeconomic backgrounds).⁵⁵ In addition, the GGRF-funded Transformative Climate Communities program, which allocated \$140 million for FY 2016-17 for comprehensive, community-guided infrastructure programs in disadvantaged communities in Fresno, Los Angeles, and Ontario, has made a commitment to expanding the use of CWAs.⁵⁶

➤ **Public Transit and Utilities**

Public transit authorities, public water agencies, and both public and investor-owned energy utilities, each with key roles in reducing greenhouse gas emissions, have traditionally provided family-supporting jobs for their workforces.⁵⁷ Public transit has been particularly successful in hiring a diverse workforce.⁵⁸ The blue-collar workforce in public water utilities is still largely white and male,⁵⁹ although some utilities have implemented a full suite of inclusion programs, including paid work-based learning opportunities and internships for local youth, and internal pre-apprenticeship pipeline programs, which have cultivated a diverse workforce.⁶⁰

❖ **Some activities that lower greenhouse gas emissions can produce lower quality jobs.**

➤ **Distributed Renewable Energy Generation and Energy Efficiency Retrofits**

Mandates and incentives to encourage both distributed renewable energy generation (e.g., customer-sited, or rooftop solar energy systems) and energy savings through retrofitting of residential and commercial buildings have resulted in mixed outcomes for workers. Particularly in the residential and small commercial sectors, some rooftop solar and energy efficiency jobs are characterized by low wages, minimal benefits and lack of career ladders.⁶¹ These jobs are in the residential and small commercial construction market, where low wages and few benefits are common and workers are sometimes subject to employee misclassification, high injury rates, and even wage theft.⁶² In contrast, distributed renewable energy generation and energy efficiency retrofits in public and some large commercial buildings tend to pay prevailing wages and benefits and use apprentices enrolled in state-certified apprenticeship programs.⁶³



➤ **Clean Vehicle Manufacturing**

Manufacturing was once a reliable source of family-supporting wages, but low-wage jobs in manufacturing have grown in recent decades.⁶⁴ Job quality within the clean vehicle manufacturing sector appears mixed in California. Concerns about the labor practices of zero-emission vehicle (ZEV) manufacturers, in both light- and heavy-duty segments, have been raised based on violations of wage, health and safety, and worker protection rules.⁶⁵ On the other hand, some zero-emission bus and rail manufacturers in the state have unionized workforces, which generally indicates higher job quality (including higher average earnings) compared to nonunionized workforces.⁶⁶ Two of these heavy-duty ZEV manufacturers in California have also committed to inclusive hiring goals and practices.⁶⁷

❖ **Several prominent industries that are critical targets for climate policy have some of the lowest wage jobs in the economy, and low-road practices impede efforts to reduce emissions.**

➤ **Trucking**

Short-haul trucking between seaports, railyards, warehouses, and other major freight hubs (port trucking or drayage, in industry parlance) is a critical part of the logistics chain and presents a significant opportunity for the adoption of zero-emission trucks. However, the prevalence of worker misclassification in trucking is not only a concern about job quality, but also with respect to achieving the environmental outcomes intended by climate policy. That is, when port truck drivers are misclassified as independent contractors instead of employees, drivers, rather than the trucking companies they work for, become responsible for the costs of switching to cleaner trucks. Clean truck mandates may not achieve, or be able to sustain, the expected reductions in air and climate pollution when misclassification is prevalent, because port truck drivers—a very low-income and largely immigrant workforce—have limited resources for purchasing and maintaining low-emission trucks.⁶⁸

➤ **Waste**

Many local governments in California contract out waste collection services and establish systems in which customers arrange services directly with authorized private waste haulers. A race to the bottom ensues under these types of systems (viz., non-exclusive franchising and open permitting systems), which results in low wages and unsafe working conditions,⁶⁹ creates obstacles for municipalities to meet state-mandated waste diversion targets and enforce other performance standards,



and contributes to problems affecting quality of life (e.g., traffic congestion and damaged local streets and roads).⁷⁰ Centralized “best value” contracting—where bidding processes include standards for contractor performance, job quality, and job access, not just cost—help prevent a race to the bottom on wages. This makes it easier to both enforce the state’s waste diversion mandates and to attract, train, and retain a qualified workforce to handle multiple waste streams.⁷¹ San Francisco and Oakland offer examples of a high-road approach to contracted waste collection services, and efforts to improve diversion and labor conditions through responsible contracting policies are underway in Los Angeles.⁷²

In the recycling industry, wage and hour violations and relatively high rates of workplace injury and illness contribute to poor job quality.⁷³

➤ **Wildfire Prevention and Forestry Services**

CAL FIRE employees spend part of their time carrying out wildfire prevention and forestry services work, and receive rigorous skills and safety training as well as family-supporting wages and benefits.⁷⁴ However, Forest and Conservation Workers overall—including tree-planters, thinners, and other vegetation management workers—have some of the lowest median hourly wages (\$10.66/hour) of all occupations in California.⁷⁵ In addition to low pay and various forms of wage theft, illegal labor practices (e.g., setting unrealistic pace of work and insufficient rest breaks) are fairly common among forestry services contractors operating on forest lands despite federal laws that prohibit such actions by employers.⁷⁶ Poor job quality and the inadequate enforcement of labor and employment law is especially problematic for vulnerable populations working in this sector, namely foreign guest workers (with H 2-B visas) and undocumented immigrants.⁷⁷ While employment data does not make it possible to disaggregate the forestry services workforce in terms of employers (i.e., public sector versus private contractors) or workers’ nativity, close attention to job quality will nonetheless be necessary to put industry expansion on the high road, as growth in the size of this workforce is critical to reducing the threat and impacts of catastrophic wildfire.

❖ **Climate policy creates the risk of future job loss in fossil fuel industries.**

➤ **Oil and Gas Production, Refining, and Distribution**

As the state transitions to a carbon-neutral economy, and as other states and countries begin to price carbon—and ramp up complementary policies like vehicle and building electrification—more aggressively, fossil fuel industries will face job losses. In fact, this is already happening due to automation in many parts of the oil



and gas industry. However, the fossil fuel sector is still an important part of the job and economic mix of California, especially in specific counties. In 2016 there were approximately 57,000 workers in these industries, including approximately 10,000 employed in refineries, 9,000 in oil and gas extraction, 2,000 in oil and gas pipeline work, and about 32,000 in natural gas distribution.⁷⁸ Fossil fuel-intensive regions of the state are already looking at economic diversification, which needs to include targeted strategies to help workers maintain their livelihood.

V. Recommendations

The following recommendations, supported by the findings in the report, begin to align the state's comprehensive climate and workforce action plans, and can help overcome a significant number of the problems identified above. Many of the recommendations can be applied in all of the six sectors in the 2017 Climate Change Scoping Plan. The state has the opportunity to explicitly incorporate the goals of job quality and job access in the next iteration of the Scoping Plan, which already embeds a commitment to equity through its support for environmental justice.

Demand-Side Strategies for Agencies Implementing Climate Measures

California's state government can use its power not only to drive low-carbon economic growth but also to support equitable development. The following recommendations are key to encouraging the generation of family-supporting jobs and access to them for workers from disadvantaged communities. Each recommendation includes an example of a current application which could be scaled and/or incorporated into climate strategies in the future.

1. Expand the use of Community Workforce Agreements (CWAs) on climate investments involving large-scale construction projects.

The predominance of the construction industry in the implementation of climate policy highlights the importance of expanding the use of the high-road strategies unique to construction, such as CWAs, which have a proven track record of ensuring job quality and job access, and securing robust training pathways through the use of state-certified apprenticeship programs in the construction trades.



Current Application

In climate policy, CWAs are currently used in the construction of utility-scale renewable energy projects, public transit and high-speed rail infrastructure, and some other large-scale construction projects funded by the GGFR.

Expansion Possibilities

Agencies or entities administering public or ratepayer funds can use CWAs on large construction projects for infrastructure investment in renewable energy, energy efficiency retrofits, EV charging infrastructure and transit infrastructure projects, installation of emission controls in refineries, leakage abatement in oil and gas distribution, and waste and water infrastructure. The typical minimum threshold for a stand-alone CWA is \$1 million in contract value, because sufficient scale is necessary to create enough jobs to successfully implement targeted hire requirements aimed at increasing economic equity.

2. Use inclusive procurement policies for public procurement of large capital equipment, contracts for public services, and in grant programs.

Government procurement policies can include requirements such as a floor on wages, skill standards, and other workforce standards in their contracts with businesses that supply capital equipment or other goods and services. Procurement language that gives bidders an opportunity to disclose additional detailed information about their commitments to high-road labor practices allows awarding agencies to identify the “best-in-class” employer as a component of bid evaluation. This incentivizes bidders to address job quality and access.

Current Application

Public agencies in California, including the High Speed Rail Authority and Los Angeles County Metropolitan Transportation Authority (LA Metro), have successfully used inclusive procurement language to ensure family-supporting jobs, substantial investments in training, and commitments to hiring disadvantaged and under-represented workers in the manufacturing of rail cars and transit buses.⁷⁹

Expansion Possibilities

In all competitive solicitations for climate mitigation, agencies or entities administering climate investment funds can use inclusive procurement policies to incorporate workforce commitments as one component of the criteria they use to rank bidders. Awarding agencies can insert this language in solicitations for the procurement of large capital equipment like buses or other fleet vehicles, for contracts for public services like waste collection and fire prevention, and in the myriad of grant programs funded by the GGFR, ratepayer funds, and other sources.



3. Include responsible employer standards in all climate incentive programs.

Responsible employer standards for incentive programs (e.g., rebates, vouchers, grants, and loan assistance) financed with public or ratepayer funds are a powerful tool to ensure adequate work quality and to prevent public funds from supporting low-wage jobs or unfair and illegal labor practices. Because incentive programs only partially subsidize private investments, the comprehensive strategies described in the first two recommendations above are not always feasible. Instead, responsible employer standards *can* screen out unwanted behavior and close off the low road by setting minimum requirements for incentive program eligibility or basic terms and conditions of program implementation. Responsible employer standards can include skill standards, a floor on wages and benefits, and labor law compliance, as addressed in the next two recommendations.⁸⁰

3a. Include skill standards to ensure safe and proper performance in programs receiving public or ratepayer funds.

Skill certifications are a way to ensure safety and high performance. Persistent quality problems have emerged in the installation, operation, and maintenance of some key technologies that are critical to lowering emissions, including HVAC and advanced lighting controls in energy retrofits.⁸¹ Safety concerns are paramount in EV-charging stations and battery storage.

Current Application

The California Public Utilities Commission (CPUC) recently mandated the use of specialized certifications for advanced lighting controls and commercial HVAC installation and maintenance in energy efficiency incentive programs.⁸² The CPUC also requires investor-owned utilities (IOUs) to utilize certified electricians who have acquired a specialized upgrade certification for the installation of IOU-owned electric vehicle supply equipment.⁸³

It is noteworthy that skill certification standards have now been established for certain major projects within the fossil fuel industry. When contracting for construction, repair, maintenance, or demolition services, owners of petroleum refining and hydrocarbon manufacturing facilities are required to ensure that contractors and subcontractors use a skilled and trained workforce, which includes active registered apprentices and skilled journey-level workers in the building and construction trades; the state law mandating a skilled and trained workforce (Senate Bill 54, Hancock, Chapter 795, Statutes of 2013) also established a prevailing wage standard for this contracted work.⁸⁴



Expansion Possibilities

Skill standards can be adopted for public and ratepayer climate investments involving skilled work, particularly for emerging technologies, technologies with safety risks, and/or climate measures with persistent performance problems. Upgrade certifications can be incorporated into program requirements for rebates, incentives, loan assistance, and more. Agencies administering programs can consult with subject matter experts, the CWDB, community colleges, the Division of Apprenticeship Standards, and high-road employers to help identify the most appropriate advanced certifications.

3b. Incorporate wage and benefits standards and verification of compliance with all employment and labor law, including health and safety standards, into incentive program requirements.

A floor on wages and benefits, as well as verification of compliance with the full range of California labor, employment, and environmental regulations can be incorporated into the terms and conditions of implementation or eligibility criteria for all climate incentive programs (e.g., rebates, vouchers, grants, and loan assistance). These standards would be especially useful for incentive programs in industries or sectors characterized by low wages, health and safety violations, worker misclassification, and other low-road labor practices. At minimum, such requirements can prevent public or ratepayer funds from benefiting low-road employers; they could also help ensure climate incentive programs deliver decent job quality outcomes.

Current Applications

The Los Angeles Department of Water and Power (LADWP) set a wage and benefits floor of \$16 per hour plus full medical and pension benefits for its weatherization workers enrolled in pre-apprenticeship (i.e., the Utility Pre-Craft Trainee (UPCT) program).⁸⁵ These workers also benefit from membership in the International Brotherhood of Electric Workers (IBEW) Local 18, a founding partner of the UPCT program.

The South Coast Air Quality Management District (SCAQMD, or the district) added new rules regarding labor law compliance to its district-funded truck replacement projects. The district assesses a company's record of labor law violations when reviewing applications for clean truck incentives, and has a disclosure and certification process regarding ongoing labor law compliance for those awarded funding. SCAQMD also prohibits trucking firms to use lease-to-own arrangements with their drivers in contracts involving district-funded trucks.⁸⁶



Expansion Possibilities

Agencies implementing climate incentive programs can use responsible employer standards to ensure that public funds do not support low-wage jobs, or firms with repeated and/or egregious violations of labor and employment laws. This practice would be especially useful in industries or sectors in which low-road working conditions are common, including residential and small commercial construction, trucking, forest and wildlands management, agriculture, some manufacturing, and subcontracted waste services.

4. Identify and focus incentives on win-win strategies that meet both climate and workforce goals.

Climate programs can be designed and phased strategically to support high-road rather than low-road employers. One strategy is to design programs to increase project scale, even within the same general market segment (e.g., multifamily residential vs. single-family homes). In construction, increased project size can facilitate the incorporation of local and targeted hire. Often, larger projects can capture economies of scale and thus also increase emissions reductions per dollar invested. Phasing incentives for emerging technologies and practices for energy savings or distributed generation in buildings, so that they first target the municipal, university, schools and hospital (MUSH) sector where labor standards usually already exist, provides an opportunity to encourage high-road employers. These employers will develop expertise and efficiency, and this can help them be competitive in more challenging sectors where low road practices are more common.

Current Application

LADWP is initiating a shared community solar pilot project that includes a wage floor and inclusionary hiring.⁸⁷

Expansion Possibilities

Community shared solar; district energy electrification (systems that provide heating and cooling from renewable sources to neighborhoods, rather than single homes).

5. Use insourcing or exclusive franchise contracting models to support labor and environmental standards for public services or ratepayer-funded subcontracts.

State and local jurisdictions and other public entities can use their own employees instead of subcontracting, or use exclusive franchise systems for services that are currently “open market.” Subcontracting in some weatherization programs has led



to low wages and lack of career ladders for workers. Open markets in waste, where customers contract with private waste providers, have impeded enforcement of state waste-diversion mandates and produced low-road labor practices. An exclusive franchise system, where local governments set contract terms and conditions, along with inclusive procurement policies, facilitate the establishment and enforcement of environmental and labor standards.

Current Application

The City of Los Angeles adopted the exclusive franchising model for its waste system. The LADWP insourced its previously subcontracted weatherization program, allowing the creation of career ladders for entry-level weatherization workers into permanent jobs in the utility.

Expansion Possibilities

Municipal waste contracting throughout the state, contracting of low-income weatherization measures, urban greening and many other public services.

6. Use metrics to measure the impact of climate policies on job growth, job quality, and job access.

Tracking and reporting on the job impacts of climate policy is necessary to measure progress over time. Measuring economic and workforce development across Scoping Plan sectors involves complex inquiries into job creation, job quality, employment of targeted groups, employment in given industries and occupations, advancement in the labor market, wages and benefits, and apprenticeship utilization. To identify, capture, analyze, and report on related metrics requires dedicated resources and considerable expertise beyond the scope of traditional labor market intelligence.

Current Application

CARB has explored methods and metrics for tracking job numbers, job quality, and job access, and is deploying a related tool for GGRF-funded projects.⁸⁸ In the construction sector, many public entities that implement CWAs for contracted projects use commercial software for prevailing wage and local hire compliance.⁸⁹

Expansion Possibilities

Technology is now available to accurately track jobs with online software programs that confidentially extract data from payroll records; these can track numbers of workers, their wages and benefits, and residence zip codes.⁹⁰ The software used in CWAs could be adopted for climate investments in construction, including GGRF expenditures and IOU contracts for energy efficiency retrofits.



7. Incorporate workforce analysis into emerging-technology support programs.

Agencies that are tasked with promoting the accelerated market adoption of emerging low-emission technologies can help ensure that technology and skill development are coordinated by requiring that workforce analysis be incorporated into emerging-technology programs. Entities that are receiving state support could be asked to identify: 1) the occupations that are critical to the planning, installation, maintenance, and operation of the technology; 2) any performance problems that were related to skill gaps; and 3) the relevant training and skill requirements that the business uses to engage qualified workers.

Workforce development agencies currently have very limited access to information on skill needs for new technologies that come to market. Workforce analysis can help fill this information gap and help training organizations identify priorities for training investments.

Current Application

One example is the collaboration between the UC Davis California Lighting Technology Center and the state-certified electrical apprenticeship programs, which supported the identification of skill gaps for the installation of advanced lighting controls and the creation of the model California Advanced Lighting Controls Training Program (CALCTP) certification for electricians.⁹¹

Expansion Possibilities

Agencies administering grants for research and development, demonstration projects, and pilot programs for emerging technologies can request that grantees identify key occupations that need to be engaged for successful performance of the emerging technologies and needs for skill upgrades, if they exist.

8. Provide technical assistance to agencies implementing climate policy on the application of demand-side tools.

The CWDB should develop a technical assistance team to advise other state agencies seeking to make high-road labor and workforce interventions through climate policies and programs. Agencies administering climate measures typically have limited experience with the job quality and job access strategies and tools outlined in this report. There is considerable relevant expertise within the CWDB that can be systematically engaged to help other public entities determine when, where, and how to implement this report's demand-side recommendations, including, for example, community workforce agreements and inclusive procurement.



Supply-Side Strategies for Workforce Development Agencies and Training Institutions

California’s robust workforce training and education infrastructure can prepare workers for the changes in the labor market that will occur as the state makes the transition to a carbon-neutral economy, particularly when combined with the demand-side actions listed above. The following summarizes key recommendations for a coordinated statewide strategy built upon partnerships with the state’s key training and education institutions, including the community colleges, the state-certified apprenticeship system, and the UC/CSU public universities, along with high-road employers, unions, and community based organizations. Crucially, investments in training should:

- Support and enhance existing programs in California’s key workforce development institutions, so that they can respond to the needed changes, instead of building new training programs specifically for emerging lower carbon technologies.
- Fund comprehensive training that prepares workers for careers, rather than niche programs that train on one particular “green” skill or “green” technology that may become outdated as technology advances.

Funding already exists for many of the initiatives recommended below, including ratepayer funds for the Electric Program Investment Charge (EPIC), and IOU energy efficiency programs. Pipeline training for the skilled construction trades has been available from Prop. 39 and now is also available from the Road Repair & Accountability Act (Senate Bill 1, Beall, Chapter 5, Statutes of 2017) as the CWDB launches its High Road Construction Careers (HRCC) initiative as an integrated statewide network of pre-apprenticeship partnerships. The challenge with existing and new investments—especially where climate agencies and CCI programs are running their own training programs—is to align the work, avoiding duplication and further fragmentation of training for California’s workers. Specific recommendations fall into four broad categories:

1. Redirect and align funding for industry-led incumbent worker training.

State investments stand to make the greatest immediate impact by focusing on training workers already employed in the key occupations critical to the transition to a carbon-neutral economy. Employer engagement in training of incumbent workers is essential. For the professional occupations, continuing education that already is embedded in licensing or credential renewal may be sufficient. For blue-collar and technical workers, high-road industry training partnerships provide a model for successful incumbent worker training, with training institutions such as the community colleges, apprenticeship programs, and others providing training *in response* to industry partnership needs.



1a. Support high-road industry training partnerships.

Industry partnerships are essential for training incumbent workers and also can serve efforts to improve inclusion of disadvantaged workers into entry-level jobs. There should continue to be expanded funding for industry partnerships in key industries in each of the Scoping Plan sectors.⁹² The CWDB's High Road Training Partnership (H RTP) initiative can serve as a model for an expanded effort that could include new apprenticeship programs and enhancements of existing programs, other labor-management partnerships, and other employer-led training initiatives in nonunionized high-road businesses. These initiatives can partner with community colleges and other training organizations to deliver skills to accelerate the adoption of clean technologies. In addition, they can provide a structure in which to engage and protect workers and find collaborative solutions as technological change and/or climate policies cause large disruptions or even elimination of certain jobs.

Current Application

H RTPs have been developed in critical industries, including transit, warehousing, logistics, transportation, water, building services, health care, and hospitality.

Expansion Possibilities

There are numerous opportunities for expansion of high-road training partnerships in industries critical to climate policies, and significant new funding for the H RTP initiative was appropriated by the Legislature during the Fiscal Year (FY) 2019/20 budget process. The report identifies opportunities in: fire prevention jobs in California's forests and wildlands, where an expanded workforce is needed because of increased fire risk; occupations engaged in pollution abatement and process improvements in refineries that are required under Assembly Bill 617 (C. Garcia, Chapter 136, Statutes of 2017) and other laws; occupations involved in waste diversion activities, which are required due to more stringent waste diversion mandates; emerging water conservation programs in the state's water utilities; and occupations involved in methane capture in dairies and waste facilities due to new mandates on emissions with high global warming potential.

1b. Support existing apprenticeship programs and, where conditions are favorable, create new apprenticeship programs.

State-certified apprenticeship is one critical approach embraced by high-road industry training partnerships and is the gold standard in training for occupations that do not require a four-year college degree. Apprenticeship has the following advantages: it is industry driven and funded, provides high returns and no debt to workers through its earn-while-you-learn model, delivers broad skills needed by employers that lead to



mastery of a trade or occupation, uses both classroom and on-the-job training, leads to wage increases as skills are acquired, and calibrates the number of training slots to the number of available jobs.⁹³ Developed in the context of an H RTP, multiple employers can identify the shared advantage of skill delivery via apprenticeship, and work to develop a common pathway; this model may be more sustainable than one in which training institutions try to convince employers from a single firm to invest in such a structure.

Current Application

The skilled construction trades all have well-developed apprenticeships and have incorporated some emerging low-emission technologies in their curricula with funding from the Employment Training Panel; firefighters also are trained through apprenticeship. Apprenticeships have also been developed in transit operations (one of the H RTP programs) and zero-emissions bus manufacturing.

Expansion Possibilities

Forestry services, waste diversion, water conservation, and other climate critical industries offer opportunities for expanding apprenticeship, as one path for the H RTPs described above. Expanding skill upgrades for emerging technologies in the skilled trades presents another key opportunity, as illustrated by model programs such as the Electric Vehicle Infrastructure Training Program.

2. Redirect and align funding for a statewide strategy for pipeline programs to expand inclusion of disadvantaged workers into family-supporting career-track jobs in the carbon-neutral economy.

A commitment to inclusion requires specific interventions that can reach all occupations critical to the transition to a carbon-neutral economy. All inclusion programs should include the following elements: 1) comprehensive services that include entry-level skills training and a suite of supports, mentoring, and wrap-around services tailored to targeted populations; and 2) explicit connections to family-supporting jobs through specific commitments from employers or other proven avenues to job placement, or entry into further career training that leads to placement in family-supporting careers.⁹⁴ In a “start with the jobs” approach as modeled by the CWDB’s H RTP and its High Road Construction Careers (HRCC) initiative, pipeline programs are designed in response to the specific needs of employers in a region, rather than starting with a training program for a given population and trying to then win employer support or commitment. Inclusion programs should not be developed for low-wage jobs unless coupled with strategies to improve job quality or create ladders from low-wage to good jobs.



2a. Support a statewide initiative for pre-apprenticeship for construction careers.

Support for pre-apprenticeship is critical to improving equity and inclusion in the skilled construction trades. Therefore, any climate investments that involve a significant amount of construction trades work and seek to increase disadvantaged and/or under-represented workers' access to employment in this industry should connect to, align with, or feed into the emerging statewide system of quality pre-apprenticeship that the CWDB is building through its HRCC initiative. The HRCC initiative builds upon CWDB's successful pilots that have helped to develop and diversify California's construction workforce industry-wide.⁹⁵ These pre-apprenticeship pilots have modeled a strategy for increasing access to state-certified apprenticeship, the highest-quality career pathway in the construction trades, rather than serving as stand-alone training programs for individual climate investment projects or programs. To support additional investment in high-road pre-apprenticeship, the CWDB has established standards for construction pre-apprenticeship ("SB 1 Workforce Guidelines") that are applicable industry-wide.⁹⁶

Funding from disparate sources, currently administered by a variety of agencies, can be consolidated to support and expand the set of coordinated pre-apprenticeship partnerships that the CWDB has invested in under the California Clean Energy Jobs Act (Prop. 39, 2012), and will bring to scale through the HRCC.

Current Application

The CWDB has been piloting its high-road construction pre-apprenticeship strategy under Prop. 39, which funded clean energy (i.e., energy efficiency and renewable energy) retrofits to K-12 schools. The same strategy, but at a larger, regional scale, will direct future workforce investments with funding from Senate Bill 1 (Beall, Chapter 5, Statutes of 2017) and the Greenhouse Gas Reduction Fund (Budget Act of 2019). In both cases, the CWDB's approach focuses on increasing access to quality construction career pathways rather than short-term training for particular construction projects or climate investment programs.

Expansion Possibilities

The state has the opportunity to work towards funding regional consortia of pre-apprenticeship programs and training partnerships to ensure calibration between the number of pre-apprenticeship training slots and the number of job openings at a regional level. The High Road Construction Careers initiative is thus suited to any sector or climate investment for which construction work represents a component of program or project implementation activities.



2b. Support inclusion programs for technical and blue-collar jobs via high-road training partnerships.

Outside of the construction sector, some jobs critical to the transition to a carbon-neutral economy that do not require a four-year college degree offer family-supporting careers and provide important opportunities for disadvantaged workers. The high-road training partnerships described above for incumbent worker training can also integrate pipeline programs. This entails close collaboration with community-based organizations and the public workforce system to provide the comprehensive supports needed to prepare under-served populations for apprenticeships or other pathways into occupations critical to the state's climate future.

Current Application

The San Francisco Public Utilities Commission and the Alameda County Waste Management both have very strong inclusion programs that provide training for career jobs to disadvantaged workers through collaborations with community organizations. In addition, in a variety of industries with growing sustainability practices, HRTPs are preparing and connecting disadvantaged workers to good jobs: the Worker Education and Resource Center for county careers in Los Angeles, the West Oakland Job Resource Center for transportation careers at the port; and the California Transit Works! for public transit careers.

Expansion Possibilities

A significant opportunity for creating inclusive pipelines is in water and energy utilities, where the existence of good jobs and an aging workforce present ideal conditions for such policies. Other strategies designed to improve jobs while reducing emissions, such as initiatives to reform contracting processes so that they include strong labor and environmental standards, can also incorporate inclusion programs to ensure that as wages rise, opportunities for historically excluded groups are expanded. A key industry in this category is waste, where reform of the contracting models is necessary to achieve the more stringent targets for waste diversion. Jobs in fire prevention and forest management in the Department of Forestry and Fire Protection also offer opportunities for inclusion through insourcing of work that is now contracted out and through the expansion of pipeline programs.

2c. Support inclusion programs for professional clean economy jobs.

A commitment to broaden access to economic opportunities that emerge from the growth of low-emission technologies and industries should also focus on inclusion into jobs that require bachelor's or graduate degrees, such as engineers, architects, and



other professional and technical workers. For these jobs, inclusion efforts are most successful when linked to preparation in high school, as it is much more difficult to create such pathways after workers leave school. Students must first gain their foundational knowledge before getting specialized training, and should be exposed to as wide a variety of viable career paths as feasible during this phase of their education. Funding to improve inclusion into professional and technical occupations related to the transition to a carbon-neutral economy is therefore most effective if it contributes to existing initiatives, rather than initiating new ones that focus only on climate-critical occupations.

Current Application

The California Partnership Academies, the California Linked Learning Initiative, and the California Career Pathways Trust all are recent initiatives linked to community colleges that are designed to build successful high-school-to-college transitions for California's many underserved youth, which can eventually lead into occupations related to climate policy implementation. The community college system, via its transfer programs, is itself a pipeline for many disadvantaged Californians into professional occupations.⁹⁷

Expansion Possibilities

Private employers and public agencies in all six Scoping Plan sectors who hire professional workers can participate in existing initiatives that expose young people to professional pathways through paid internships and other programming for inclusion.

3. Support curriculum upgrades and teacher training for emerging technologies in occupations critical to the transition to a carbon-neutral economy.

To prepare the next generation of energy engineers, electricians, zero-emission bus mechanics, transportation planners, and **all** the other occupations that are necessary to develop, design, plan, build, operate, and maintain new technologies that lower greenhouse gas emissions, the state should support the incorporation of new relevant skills and knowledge in the existing key postsecondary institutions that already provide foundational training for priority occupations. The state can accomplish this by supporting curriculum upgrades and instructor professional development in community colleges, apprenticeship programs, and four-year colleges.

Current Application

The community colleges have developed the Advanced Transportation and Logistics Initiative and the Energy Construction and Utilities Initiative, which use staff trained as “sector navigators” to work with industry to identify skill gaps and incorporate relevant skills and knowledge into curricula of programs of study for key occupations.



Apprenticeships in the trades continually incorporate needed new skills through employers' participation on curriculum committees.

Expansion Possibilities

There is an opportunity to more systematically support curricula upgrades related to climate in community colleges, apprenticeship, and four-year universities, by transferring information derived from emerging technology programs to appropriate institutional venues for curricula upgrades, as described in demand-side recommendation #7, above.

4. Track outcomes of all training programs.

To evaluate and improve training investments over time, all training programs should track workforce outcomes for participants. Key metrics include not only number of enrollees and number of graduates, but also attainment of industry-recognized credential, job placement, job retention, initial wages, and wage mobility over time. In addition, resources could be devoted to the challenging but valuable work of tracking benefits to employers in terms of increased productivity and quality. This critical work is time-consuming and expensive, and where mandated should include appropriate staff, technological, and financial resources. Requiring tracking at any level of training, from entry level to incumbent worker training, is essential to improve training over time and direct training investments towards programs that produce the best outcomes for workers. Finally, the state should continue to invest in third-party studies and evaluations that assess the broad, integrated, social and economic impact of workforce partnerships, considering the costs and value of building a high-road training infrastructure that addresses both climate and equity concerns, and measuring broader community outcomes that go beyond individual labor market advancement.

Just Transition for Workers and Communities Facing Industry Decline

California can and should build an inclusive carbon-neutral economy based on high quality jobs. At the same time, the state must acknowledge those industries and jobs that have been part of its economic foundation for generations, and that may experience decline as California and many other jurisdictions (within and outside the U.S.) begin a steady decrease in fossil fuel use. Specific regions of California have long depended on jobs in the oil and gas sector, and in other sectors that have traditionally depended on fossil fuels for heat, power, or raw material inputs. It is imperative for the state to develop strong policies to help diversify the economies of these regions, as well as to identify transition strategies for workers and communities dependent on fossil fuel or emissions-intensive industries. Transition assistance programs that focus on securing comparable jobs or incomes provide some models to consider.⁹⁸



The following recommendations reflect a phased approach that aims to prepare and support at-risk workers and communities, at the same time the state considers broader and more comprehensive strategies to help strengthen and diversify key regional economies.

1. Short term: Fully explore alternatives to plant closures when there are other strategies available that will achieve greenhouse gas emissions reductions *and* local pollution abatement.

In specific communities, immediate plant closure may not be the best and most equitable way to achieve the state's carbon emission goals. It is important to explore whether in the short term, continued investments in emissions abatement and targeted enforcement of pollution mandates for heavy emitting industries could ensure maximum job retention concurrent with decreasing emissions and pollution. This includes deploying Best Available Retrofit Technology as required in AB 617, fugitive methane emissions capture mandates, and industrial energy efficiency incentive programs. Targeted investments in pollution abatement can create jobs, many in sectors where skilled workforce standards already speak to job quality.

2. Longer term: Convene an interagency task force to develop concrete, specific plans for short-term and long-term transition.

2a. Identify priority transition assistance needs.

The state could work to identify the most vulnerable industries, firms, and localities through research and engagement of a diverse set of business, labor, and community interests, and develop a set of the most likely job disruption scenarios through 2030. At the same time, the state could work to support regions in an economic analysis of the most promising emerging high-road industries and jobs based on specific regional assets including geography, educational and research institutions, and existing workforce skills. For each scenario, the task force could develop cost estimates for a transition plan, incorporating a variety of assistance packages. Such estimates should examine options for retraining and job placement, considerations regarding the speed of industry transition, and firm and worker characteristics such as the health of pension plans and the age of workforce. This work could be facilitated by the High Road Training Partnerships described above, which would provide a framework for stakeholder discussion and planning.



2b. Facilitate a planning process for transition assistance.

Based on the identification of priorities, the state could work with at risk communities, labor, and business—again, ideally through regional industry partnerships such as the HRTPs—to develop and propose a set of key criteria for transition programs that include a combination of income and benefits support, skills training, and job creation. Ultimately, any program will need to be directly beneficial to the specific region and industry affected. Potential benefits could include income support; continued pension accrual and health care benefits; a bridge to retirement for older workers; sizable job training, retraining, or education allowances and case management to improve the likelihood of re-employment at comparable wages; consideration of guaranteed employment in public works or first source privilege in hiring; and even outside the box ideas such as college aid for the children of displaced workers.

VI. Conclusion

California's ambitious path towards a carbon-neutral economy is complex, involves and affects different industries and occupations in multiple ways, and holds both promise and challenges for the state's working families. The analysis and recommendations here present actions that show a high road to climate policy is both valuable and feasible.



Endnotes

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(a) No later than January 1, 2019, the California Workforce Development Board, in consultation with the state board, shall report to the Legislature on the need for increased education, career technical education, job training, and workforce development resources or capacity to help industry, workers, and communities transition to economic and labor-market changes related to statewide greenhouse gas emissions reduction goals, pursuant to Sections 38550 and 38566, and the scoping plan, adopted pursuant to Section 38561. The California Workforce Development Board shall ensure that the report aligns, as appropriate, with California’s Unified Strategic Workforce Development Plan, developed by the California Workforce Development Board. The California Workforce Development Board and the state board shall work in consultation with all of the following:

(1) State Department of Education.

(2) California Community Colleges.

(3) Trustees of the California State University.

(4) Regents of the University of California.

(5) Governor’s Office of Business and Economic Development.

(6) Interested stakeholders.

(b) The report to the Legislature shall address all of the following:

(1) Creating and retaining jobs and stimulating economic activity in the state.

(2) Imbedding workforce training and employment services in infrastructure investments so that services more directly connect to the jobs created.

(3) The use of community benefits agreements, community workforce agreements, and project labor agreements that connect workforce services and job training directly to jobs impacted or jobs created.



- (4) Preparing the state's students with relevant career technical education that responds to business and industry demands.
 - (5) Developing worker retraining programs to assist the existing workforce with the necessary tools to upgrade their skills.
 - (6) Responding to the job creation and workforce needs of the state's new and emerging industries, including emerging technologies that will result in greater greenhouse gas emissions reductions.
 - (7) Developing job training programs to assist specific populations, such as at-risk youth, displaced workers, veterans, the formerly incarcerated, and others facing barriers to employment.
 - (8) Opportunities for community-based organizations to partner with local workforce agencies to improve the labor-market outcomes of targeted disadvantaged populations.
 - (9) Targeting workforce development programs and activities in disadvantaged communities, as identified pursuant to Section 39711, and communities that are located near entities regulated by the state board pursuant to this division.
 - (10) Identifying and leveraging state and federal funding resources to implement the recommendations made in the report consistent with the regulatory purposes of this division.
- (c) This section shall remain in effect only until January 1, 2031, and as of that date is repealed.

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