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California: A Tale of Two Regions

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Part of *The Emerging Bio-Economy: California Opportunities and Challenges in a Global Transformation?*

A UCOP project led by Tom Harmon, David Zilberman, John Zysman

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7.1 A bioeconomy to bridge developmental gaps in California

The Golden State faces dual challenges: It needs to simultaneously address pressing environmental sustainability concerns while, at the same time, promoting social and economic prosperity for all Californians, especially for those in inland regions that have not enjoyed the same levels of prosperity as the generally more affluent coastal areas.

California's coastal and inland economies have grown apart for decades, producing stark gaps in income, jobs, and opportunity. The bioeconomy offers a path to close this divide by turning inland California's agricultural assets and land into strategic inputs for a new generation of industries — biomanufacturing, agtech, and clean energy — while leveraging coastal strengths in human capital, AI, and life sciences. The result is a model where both regions benefit and growth is more broadly shared. Regions that embrace the rapid, systemic changes posed by the bioeconomy transition will have an opportunity to disrupt markets, differentiate, and specialize in the goods and services that will be demanded in a new, sustainable economy.¹

To achieve its full potential, the bioeconomy will need to be supported by a set of institutions, policies, and regulations. California has already started down this path. The state has in place multiple initiatives, plans, incentives, and, most importantly, the political capital to transit towards a greener economy. However, this transformation requires a government that moves fast and in a coordinated fashion to deliver for inland regions—and for those that have been left behind in other parts of the state as well. The success of the state's transition to a bioeconomy may well hinge on how quickly and effectively it adopts the necessary policies to support the bioeconomic transition.

At the same time, the bioeconomy presents an opportunity for coastal areas to maintain their economic prominence on the national and international stages and continue leading through innovation, instead of becoming followers and losing relevance. One of California's potentially enormous opportunities is therefore the potential synergies between coastal and inland California.

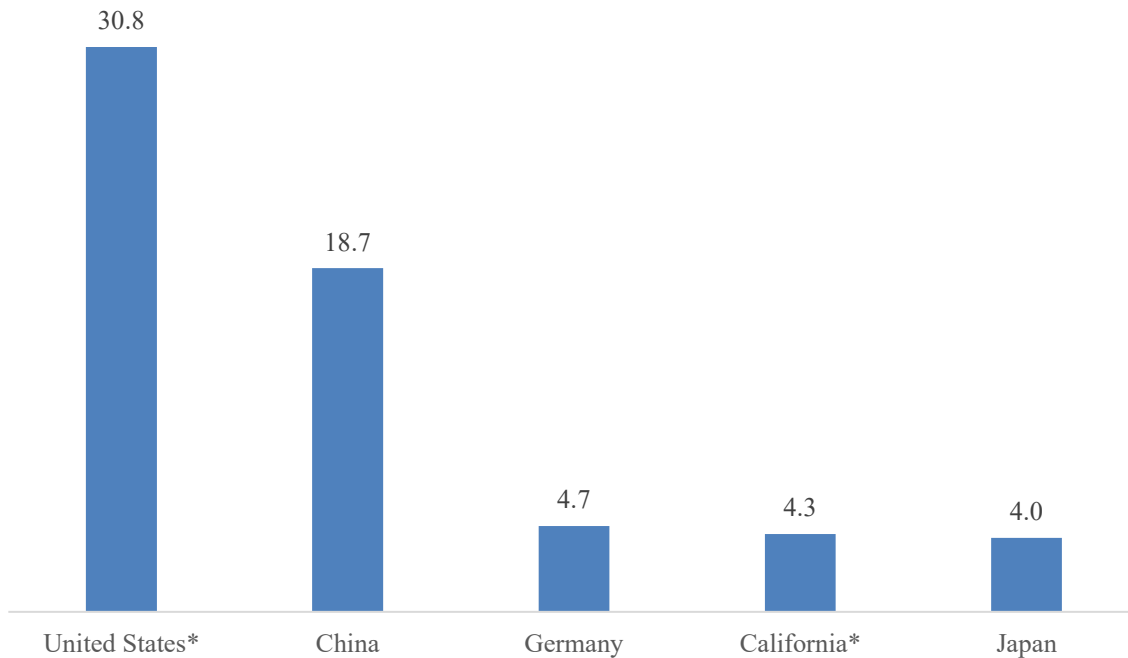
Key points of action for the government include facilitating efforts for companies and individuals to acquire the capabilities and access the resources they need to excel in the bioeconomy, support regional ecosystems that allow for the coordination of key stakeholders, and stimulate the creation and growth of businesses that support good-paying jobs at the regional level. The rest of the chapter addresses some of these ideas in more detail. The second subsection highlights some of the contrasts present in California, a place where immense wealth and ingenuity coexist with enormous socioeconomic challenges, while the third characterizes some of the developmental differences between inland and coastal regions and how they have evolved in recent years. The fourth subsection presents examples of ongoing efforts that are already contributing to the advancement and consolidation of the bioeconomy in California. Finally, the last section presents some recommendations and conclusions.

¹ [Zysman, John, D. Zilberman, and D. Breznitz. 2024. Pathways For A Green Transition To A Bio-Economy. BRIE Working Paper 2024-3. Berkeley Roundtable on the International Economy.](#)

7.2 California, land of contrasts

As is well known, the Golden State is the 4th largest economy in the world. With a Gross Domestic Product of close to \$4.3 trillion, California surpasses even Japan, India, and the United Kingdom (Figure 7.1). On a per capita basis, California's GDP is greater than that of all of the major economies. The state leads not only in economic scale but also in innovation and productivity: home to 57 fortune 500 companies, California produces more patents per capita than any other state in the U.S.², and ranks third in overall labor productivity in the country.³

Figure 7.1 - Gross domestic product, 2024 (\$ Trillion)



Source: [World Bank](#) and Bureau of Economic Analysis, 2025. *2025 data from BEA.

In addition, California has a top-tier research and educational ecosystem that includes the flagship 10 campus University of California system, private universities such as Stanford and Caltech, an extensive state university and community college network, four Department of Energy national laboratories, and the largest higher education expenditure in R&D of any state⁴, with public institutions investing alongside private partners in cutting-edge technologies and innovations. It also boasts serious private R&D capabilities within the private sector.

California leads in keystone industries such as manufacturing, tech, and agriculture. In the former, the state has more than 45,000 companies that employ 1.2 million workers specializing in computer and

² U.S. Patent & Trademark Office, 2024.

³ [Bureau of Labor Statistics. 2025. Productivity by State.](#)

⁴ [Rankings by total R&D expenditures.](#)

electronic products, transportation equipment—including zero emission vehicles, and aerospace technologies, among others.⁵

When it comes to the tech sector, California has a stage 1 innovation model powered by the tech giants anchored in Silicon Valley—like Meta, Apple, and Nvidia, that specialize in transforming the newest technologies into useful innovations.⁶ Thirty-three of the top 50 privately held artificial intelligence (AI) companies around the globe are located in the state, which is also a magnet for AI investment and AI talent.⁷

Crucially for the growth of the bioeconomy, California’s leadership in tech is complemented by its dominance in agriculture: California is the top agricultural state in the country, employing close to 850,000 farmworkers⁸ and generating enormous value for the economy—\$59 billion output in 2023. The state feeds the nation by producing nearly half of the vegetables and over three-quarters of the high value fruits and nuts grown in the country.⁹

At the same time, California is deeply interconnected with the rest of the world through trade and investment. Its main trade partners include markets as diverse as Mexico, Canada, China, Taiwan, South Korea, and Japan. In 2025, the state exported \$188 billion of goods—87 percent of that was manufactured products, positioning as the 2nd largest state exporter state in the U.S.¹⁰ California is not only the leading state producer of farm products but also the country’s largest agricultural exporting state (\$24 billion in 2023¹¹). Foreign direct investment is also strong in California: 18,500 foreign owned enterprises employ 800,000 workers in the state (close to 4.5% of total employment in 2024).¹² One in three workers in California are foreign-born and more than half of workers are immigrants or children of immigrants,^{13 14} reflecting the state’s capacity to attract talent from all over the world.

However, despite all its economic might, California faces immense challenges. The economic development that has made the state a technological and innovative powerhouse has also widened the economic divide among its citizens.

Today, Californians feel skeptical about the opportunities the Golden State can provide for them and future generations. Seventy percent of California adults believe the state’s children will be worse off financially than their parents when they grow up and about 60% think achieving the American dream of

⁵ <https://www.gov.ca.gov/2025/10/22/governor-newsom-outlines-californias-economic-dominance-at-the-california-economic-summit/>; [Bureau of Economic Analysis - Regional Data](#); [Bureau of Labor Statistics - Economy at Glance, California](#).

⁶ For a more nuanced take on stage 1 innovation models, see Breznitz, Dan. 2021. Innovation in Real Places. Strategies for Prosperity in an Unforgiving World.

⁷ <https://www.gov.ca.gov/2025/09/18/californication-of-ai-golden-state-is-1-in-ai-and-the-birthplace-of-modern-tech-so-yeah-be-quiet-ted-cruz/>

⁸ Workers employed for wages sometime during a typical year on California farms. California farms [employed](#) an average 420,000 FTE workers in 2022.

⁹ [California Department of Food and Agriculture. 2025. California Agricultural Statistical Review.](#)

¹⁰ [Payares-Montoya, Daniel and Sarah Bohn. 2026. California’s Economy. Public Policy Institute of California.](#)

¹¹ Other methodologies produce slightly different estimates. See, for example, [US Department of Agriculture](#).

¹² [World Trade Center Los Angeles. 2025. Foreign Direct Investment in California 2024.](#)

¹³ [Cuellar Mejia, Marisol and Hans Johnson. 2026. Immigrants in California. Public Policy Institute of California.](#)

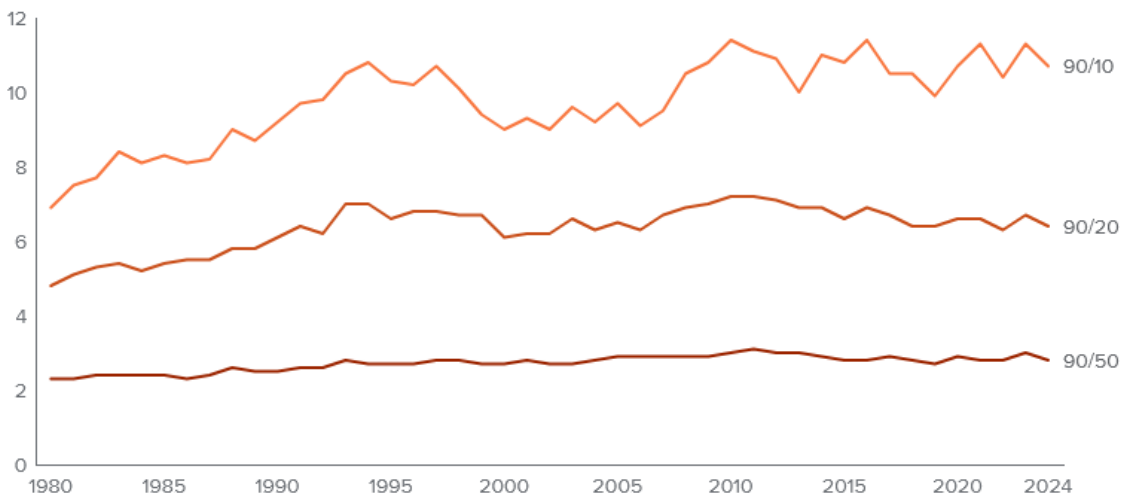
¹⁴ [Davalos, Monica. 2025. Over Half of All California Workers Are Immigrants or Children of Immigrants. California Budget & Policy Center.](#)

working hard and getting ahead is harder in California than elsewhere. Only one in three think that the American Dream still holds true.^{15 16}

Despite record increases in wages in recent years, affordability has become one of the most important issues in California, especially for low- and middle-income families.^{17 18} Pandemic-era inflation rates for consumer goods¹⁹, housing prices (double the national median)²⁰, and high electricity rates (second-highest in the country)²¹ place a financial strain on low- and middle- income Californians and make it very hard for them to make ends meet. For those at the bottom of the income distribution the situation is especially harsh as they spend greater shares of their income on goods and services that have become less affordable over the years.²²

In addition, the gap between high and low incomes is wider in California than in most other states and has been increasing amidst immense wealth creation (Figure 7.2).^{23 24} Top incomes have grown faster over the long term driven by technological change, globalization, and educational attainment, creating striking gaps between racial groups.

Figure 7.2 - Ratio between top incomes and others in California, 1980-2024



Source: [Public Policy Institute of California](#) based on IPUMS CPS-ASEC data.

¹⁵ [Mark Baldassare, Dean Bonner, Lauren Mora, and Deja Thomas. 2024. PPIC Statewide Survey: Californians and Their Economic Well-Being. Public Policy Institute of California.](#)

¹⁶ [Bonner, Dean. 2023. Is the American Dream in California Dying? Public Policy Institute of California.](#)

¹⁷ [Bohn, Sarah. 2025. Testimony: Cost Pressures and Affordability for Californians in Today's Economy. Public Policy Institute of California.](#)

¹⁸ [Baldassare, Mark, Dean Bonner, Lauren Mora, and Deja Thomas. 2026. PPIC Statewide Survey: Californians and Their Government. Public Policy Institute of California.](#)

¹⁹ [California Consumer Price Index.](#)

²⁰ [Johnson, Hans and Eric McGhee. 2025. Three Decades of Housing Challenges in the Golden State. Public Policy Institute of California.](#)

²¹ [Kerstein, Helen. 2025. Assessing California's Climate Policies—Residential Electricity Rates in California. Legislative Analyst's Office.](#)

²² [BLS - Consumer Expenditure Survey, 2022-2023.](#)

²³ [Thorman, Tess and Daniel Payares-Montoya. 2025. Income Inequality in California. Public Policy Institute of California.](#)

²⁴ [Thorman, Tess and Shannon McConville. 2025. Assets, Debts, and Wealth in California. Public Policy Institute of California.](#)

After a historical reduction during the pandemic, California’s poverty rate has rebounded to 17%. Close to one-third of Californians are living in or near poverty, with Latino and Black groups being affected the most.^{25 26} As the state faces budgetary constraints, the elimination of pandemic-era expansions supports,²⁷ and the potential suspension of federal safety-net programs, poverty is most likely to continue to rise in the near term.

Importantly, having a job is not a guarantee for being out of poverty in California: in 2023, 9.8% of workers aged 25–64 were living in poverty and 50% had a full-time job.²⁸ This situation impacts more severely service and agricultural workers, Latinos, and less-educated workers across the state.

Reversing some of these trends will be hard, especially in the face of strong headwinds in the short and long term. More immediately, federal policy on key areas like trade, immigration, the energy transition, and government employment and spending could negatively impact the state’s capacity to grow and create good jobs in some of the industries that have propelled California’s economic prosperity in recent decades.

To make matters worse, the aging of the state’s population and the shrinking of the workforce will create budgetary challenges as older adults demand more health care and other services, and fewer Californians contribute to the economy.^{29 30}

Finally, climate and water concerns are likely to significantly affect California’s agriculture in the coming decades if not addressed:

- **Climate and water challenges facing California agriculture.** California's geography makes drought and water scarcity inevitable challenges. Climate change will intensify these problems, creating economic, social, and environmental consequences that hit vulnerable communities hardest.
- **Threats to water supply.** California agriculture depends on a water system now under severe threat. By 2050, the Sierra Nevada snowpack—which provides roughly 30% of the state's annual water supply—could decline by up to 45%. This loss is critical because earlier snowmelt means less natural water storage during summer months when crops need irrigation most. Meanwhile, rising sea levels are increasing salt levels in the Sacramento-San Joaquin Delta, where California's two major water projects draw their supplies. This saltwater intrusion is already

²⁵ [Bohn, Sarah, Caroline Danielson, Sara Kimberlin, Patricia Malagon, Clare Stevens, and Christopher Wimer. 2025. Poverty in California. Public Policy Institute of California.](#)

²⁶ [Anderson, Alissa, Kayla Kitson, Laura Pryor, Adriana Ramos-Yamamoto, and Monica Saucedo. California’s Poverty Rate Soars to Alarming High Levels in 2023. 2024. California Budget & Policy Center.](#)

²⁷ For example, the federal Child Tax Credit, the expanded Earned Income Tax Credit for childless workers, and enhanced unemployment benefits.

²⁸ [Bohn, Sarah, Caroline Danielson, Sara Kimberlin, Patricia Malagon, Clare Stevens, and Christopher Wimer. 2025. Poverty Among California’s Workers. Public Policy Institute of California.](#)

²⁹ [Johnson, Hans, Eric McGhee, Paulette Cha, Shannon McConville, and Shalini Mustala. 2025. California’s Aging Population. Public Policy Institute of California.](#)

³⁰ [Lafortune, Julien, Sarah Bohn, Marisol Cuellar Mejia, Jenny Duan, Hans Johnson, and Shannon McConville. 2024. Labor Force Participation in California. Public Policy Institute of California.](#)

contaminating coastal groundwater aquifers along the central and south coasts, further compromising water quality for agriculture.

- **Direct impacts on crops.** Beyond water scarcity, climate change will stress crops in multiple ways: Reduced winter chill hours needed for many tree crops to produce fruit; more extreme heat days that damage plants and reduce pollination success; higher evapotranspiration rates that increase water demand just as supplies shrink; and expanded pest populations with faster reproduction cycles due to warmer temperatures. These combined pressures will reduce crop yields, increase production costs, and shrink water availability. Agricultural revenues are projected to decline across all regions—threatening an industry that produces over one-third of the nation's vegetables and two-thirds of its fruits and nuts.

Researchers emphasize that California's agricultural system developed under expectations of reasonably static hydrology—conditions that no longer exist. The convergence of reduced water availability, higher temperatures, more extreme weather variability, and increased biological stressors creates compounding vulnerabilities that could fundamentally reshape which crops can be grown where in California, with significant implications for both the state's economy and national food security. Worse, if not addressed, these issues could deepen the economic divide in a state that desperately needs to create economic opportunity for everyone.

7.3 Uneven regional development in California

California is one of the most diverse states in the nations, composed of different regions with unique advantages and challenges. The coastal regions, which include the Bay Area metro area, the Central Coast, and Los Angeles, Orange, and San Diego counties, are usually associated with economic prosperity, innovation, and opportunity. Other parts of the state, like the Central Valley and Sierra, the Inland Empire, Sacramento, and the Northern region, are synonymous with low-wage jobs, economic decline, and scarce opportunities to get ahead.³¹

The contrast between the state's coastal and inland regions is the result of uneven economic development. Since the 1990s, coastal cities have benefited from a globalized, knowledge-driven economy and breakthroughs in new high-added value industries, while inland California remains mainly rural, less economically diverse, and has struggled with the post-Cold War decline in defense spending and the loss of manufacturing jobs and investment.³²

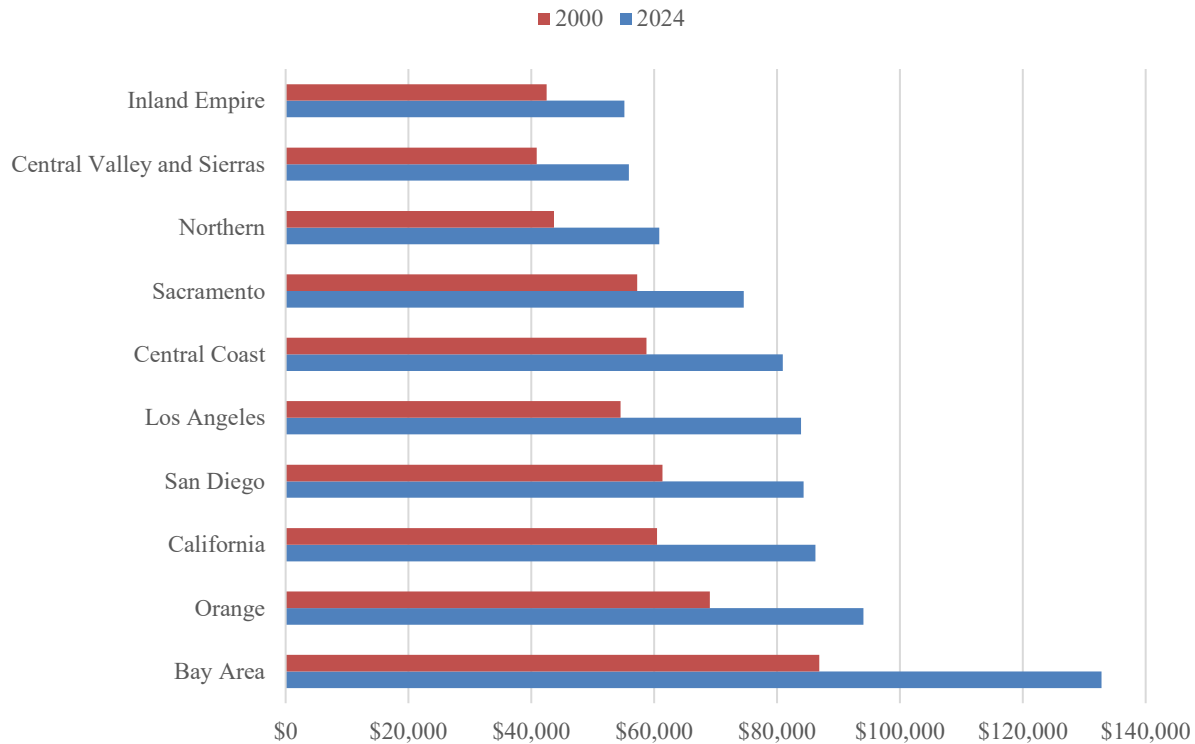
Evidence of the widening gap between California regions is reflected in disparities in per capita income, poverty rates, access to good jobs, and educational attainment.

³¹ Coastal California includes the Bay Area, the Central Coast, and Los Angeles, Orange, and San Diego counties. Inland California refers to the Central Valley and Sierra, the Inland Empire, the Northern region, and Sacramento. Regions are defined by counties; starting with the three largest counties— Los Angeles, Orange, and San Diego, then Northern (Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Tehama, Trinity, Sutter, Yuba), Sacramento (El Dorado, Placer, Sacramento, Yolo), Bay Area (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma), Central Valley and Sierras (Alpine, Amador, Calaveras, Fresno, Inyo, Kern, Kings, Madera, Mariposa, Merced, Mono, San Joaquin, Stanislaus, Tulare, Tuolumne), Central Coast (Monterey/San Benito, San Luis Obispo, Santa Barbara, Ventura), and Inland Empire (Imperial, Riverside, San Bernardino).

³² [Little Hoover Commission. 2023. Equitable Economic Development Across California.](#)

During the 21st century California regions have grown apart in income as four-fifths of all economic activity remains concentrated in California coastal regions.³³ While the Bay Area increased its per capita income approximately 53% between 2000 and 2024, the Central Valley and Sierra and the Inland Empire only grew between 30% and 38%, contributing mightily to the disparity between regions. (Figure 7.3).³⁴

Figure 7.3 - Regional per capita income, 2000 and 2024



Source: [Public Policy Institute of California](#) based on Bureau of Economic Analysis, 2025.

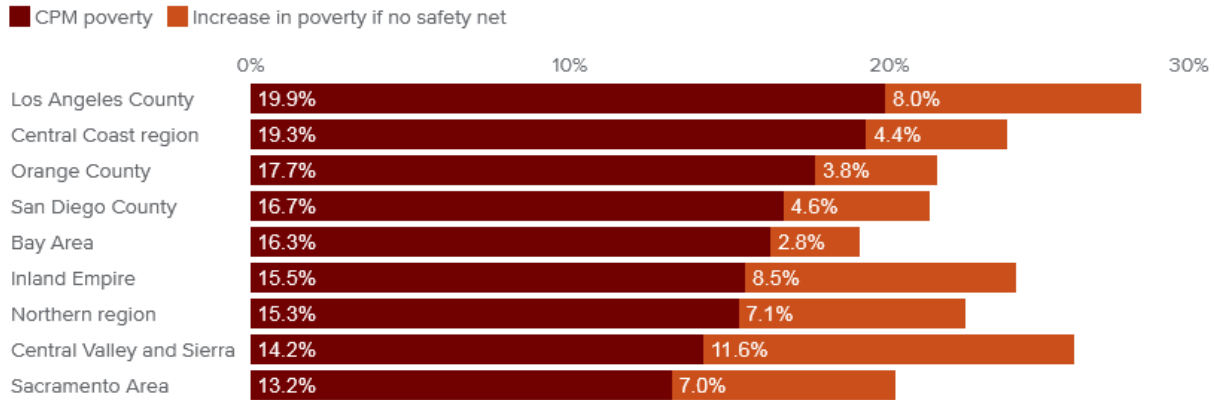
With the exception of Los Angeles, California’s inland regions have the highest poverty rates in the absence of safety net programs. Los Angeles (poverty rate of 28%) is followed by the Central Valley and Sierra (26%), the Northern region (22%), and the Inland Empire (24%) (Figure 7.4). The poverty rate in the Bay Area is the lowest one (19%). While higher incomes in coastal areas make more residents ineligible for safety net programs, higher living expenses, like housing, put many below the poverty line.³⁵

³³ In 2023, 80 percent of the state’s GDP was concentrated in the coastal areas: the Bay Area (34%), Los Angeles County (25%), Orange County (9%), San Diego County (8%), and the Central Coast (4%).

³⁴ [Payares-Montoya, Daniel and Sarah Bohn. 2026. California’s Economy. Public Policy Institute of California.](#)

³⁵ [Bohn, Sarah, Caroline Danielson, Sara Kimberlin, Patricia Malagon, Clare Stevens, and Christopher Wimer. 2025. Poverty in California. Public Policy Institute of California.](#)

Figure 7.4 - Regional poverty rates, 2023



Source: [Public Policy Institute of California](#) estimates from the California Poverty Measure, 2023.

These disparities can be explained in part by the type of opportunities California regions are able to provide to its citizens. As the structure of the state’s economy changed in the last decades (Table 7.1) so did the economic structure of the state’s regions. With the stagnation of manufacturing activity, the prevalence of finance, and the growth of professional services and tech, coastal regions have been able to benefit the most in comparison to inland California through changes in industry employment and the labor force.³⁶

Table 7.1 - GDP share by industry, 2000 and 2025

Industry	2025	2000	Change (p.p.)
Finance, insurance, real estate, rental, and leasing	18.7%	23.3%	-4.7
Professional and business services	18.4%	15.5%	2.9
Information	17.0%	4.3%	12.7
Manufacturing	10.7%	11.2%	-0.4
Educational services, health care, and social assistance	9.2%	7.1%	2.1
Retail trade	6.0%	7.4%	-1.4
Wholesale trade	4.6%	6.7%	-2.1
Arts, entertainment, recreation, accommodation, and food services	4.2%	5.8%	-1.6
Construction	3.3%	7.1%	-3.7
Transportation and warehousing	3.3%	3.3%	-0.1
Other services (except government and government enterprises)	1.6%	4.4%	-2.8
Utilities	1.4%	1.9%	-0.4
Agriculture, forestry, fishing and hunting	1.2%	1.5%	-0.3
Mining, quarrying, and oil and gas extraction	0.4%	0.5%	-0.2

Source: Authors’ calculations based on Bureau of Economic Analysis, 2025. Private industries.

³⁶ In 2000 manufacturing was the third largest economic sector and in 2025 it was the fourth largest—excluding government, after being surpassed by information. The financial sector remained the largest industry in the state followed by professional services.

The Bay Area has a larger share of workers in professional, scientific, and technical services, with tech jobs heavily concentrated there and in Los Angeles.³⁷ Inland regions, on the other hand, have a higher share of jobs in agriculture, logistics, and retail that pay comparatively less median and average wages.³⁸ Inland regions tend to have higher unemployment rates than coastal ones even despite showing an important recovery during the post-pandemic period.³⁹

California's regional economies differ dramatically in their employment composition and wage structures, with professional services being the most common employment sector in the Bay Area, while transportation, warehousing, and logistics dominate in the Inland Empire and Central Valley. The Bay Area has the highest median wage at \$37 per hour in 2024, compared to \$24 in the Inland Empire and \$22 in the Central Valley and Sierra region, reflecting the concentration of higher-paying professional and technical occupations in coastal areas versus lower-wage agricultural, retail, and logistics jobs in inland regions.⁴⁰

Sector-specific trends reveal these structural differences. Trade, transportation, and utilities jobs have grown 15.5% in the Inland Empire and 9.4% in the Central Valley since the pandemic, while the Bay Area has seen an 8.4% decline in leisure and hospitality employment and a 6.1% decline in trade, transportation, and utilities. These diverging patterns reflect both the sectoral composition of each region and the varying performance of those sectors, driven by factors including migration patterns, cost-of-living pressures, and remote work persistence.⁴¹

Human capital disparities are also present across the state, with bachelor's degree attainment varying dramatically across regions (Figure 7.5). While in the Bay Area half of those age 25 or older have completed a bachelor's degree in the Inland Empire and Central Valley and Sierra only two out of ten have achieved that milestone. A more educated workforce is not only able to access higher earnings and better job benefits through new economic opportunities, but the regions where they live can also benefit from higher investment and more economic growth as companies locate there to take advantage of a more capable, productive human capital.

³⁷ [Cuellar Mejia, Marisol and Sarah Bohn. 2024. Each California Region Tells a Different Job Story. Public Policy Institute of California.](#)

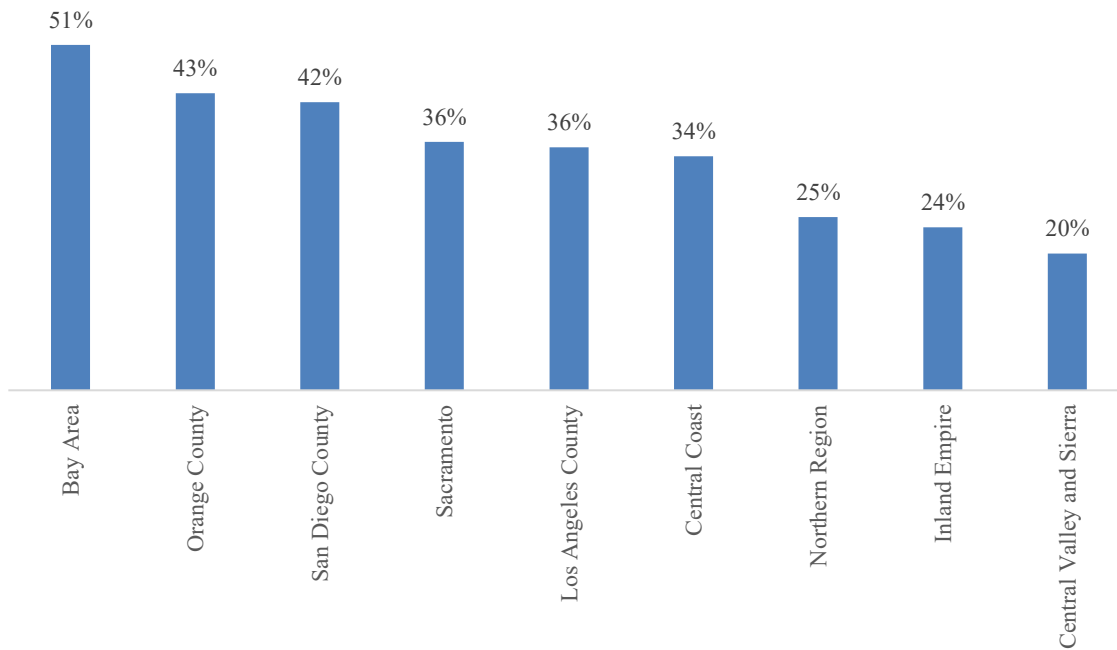
³⁸ [Cremin, Sean and Tess Thorman. 2025. Who are California's Workers? Public Policy Institute of California.](#)

³⁹ [Employment Development Department. 2025. California Jobs Market Report.](#)

⁴⁰ [Cremin, Sean and Tess Thorman. 2025. Who are California's Workers? Public Policy Institute of California.](#)

⁴¹ [Thorman, Tess and Daniel Payares-Montoya. 2025. Income Inequality in California. Public Policy Institute of California.](#)

Figure 7.5 - Bachelor's degree completion for population age 25+



Source: Authors' calculations based on [National Institute on Minority Health and Health Disparities, Census Bureau](#), and [American Community Survey](#), 2019-2023.

7.4 Institutional levers for advancing the bioeconomy in California

As the need to transition to a bioeconomy increases, new institutional arrangements will be needed as well. These arrangements include regulations, policies, and institutions that push the state towards the green transition while supporting economic growth and social well-being. The good news is that California has already taken important steps that could make this transition smoother.

To start with, California is a leader when it comes to the decarbonization of the economy and the energy transition. The state has a scoping plan to achieve carbon neutrality and reduce anthropogenic greenhouse gas (GHG) emissions by 85 percent below 1990 levels by 2045.⁴² To achieve this goal, major policies and programs as well as important investments in a range of projects have been put in place, including clean energy generation, zero-emission vehicles, and battery storage technology.

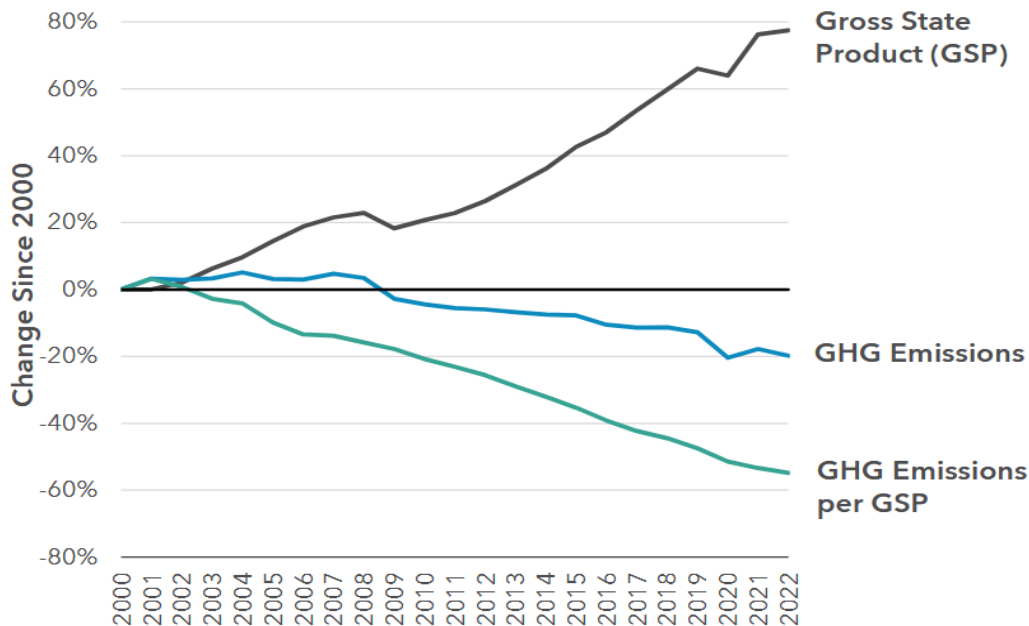
These efforts have materialized in the decoupling of economic growth from GHG emissions for most of this century, with sectors like transportation, electricity, industrial, and agriculture seeing leading the way in emission reductions.^{43 44}

⁴² [California Air Resources Board. 2024. California Greenhouse Gas Emissions from 2000 to 2022: Trends of Emissions and Other Indicators.](#)

⁴³ <https://ww2.arb.ca.gov/news/california-greenhouse-gas-emissions-decline-across-most-sectors>

⁴⁴ Some examples of interventions include regulations such as the [Advanced Clean Cars](#), the [Low Carbon Fuel Standard](#), and the [Renewables Portfolio Standard](#), programs like [Cap-and-Trade](#), and investments like [California Climate Investments](#).

Figure 7.6 - California has been able to decouple growth from GHG emissions



Source: [California Air Resources Board, 2024](#).

In relation to economic development, California is currently implementing a state economic blueprint for advancing an innovative and entrepreneurial economy at the regional level that supports the creation of good-paying jobs.⁴⁵ The blueprint identifies strategic sectors and subsectors that were defined based on each region's capabilities and comparative advantages, as well as the prioritization made by local stakeholders. The bioeconomy is specifically mapped in the blueprint as an emerging subsector that requires entrepreneurs, researchers, and innovators to access capital and other resources to crystallize their ideas and compete in the world markets. All inland regions prioritized the bioeconomy to be one of their focus areas of economic development.

Importantly, other sectors and subsectors that are complementary to the bioeconomy are also included in the blueprint and have been mapped by inland regions. These include agricultural production, food processing, medtech, biotech, agritech, artificial intelligence, and clean energy.

One example of this approach includes the Circular Bioeconomy Innovation Collaborative led by the University of California, Merced and Lawrence Berkeley National Lab. The Collaborative aims to accelerate the circular bioeconomy in the North San Joaquin Valley by improving agriculture sustainability and fostering the creation of good-paying jobs in the region. Using resources from the National Science Foundation, the state, and the private sector, more than 100 organizations are currently working together to establish bioindustrial manufacturing capabilities to create products, materials, and fuels from renewable sources that can be taken to the market.^{46 47}

Other institutional arrangements that have been in place even before the blueprint can also be articulated to support the bioeconomy. One of these cases is the Fresno DRIVE (Developing the Region's Inclusive

⁴⁵ [California Jobs First. 2025. State Economic Blueprint.](#)

⁴⁶ <https://newscenter.lbl.gov/2023/05/11/californias-northern-san-joaquin-valley-bioeconomy/>

⁴⁷ <https://www.beamcircular.org/news-updates/innovationcampusfundingannouncement>

and Vibrant Economy) initiative, created in 2020 by civic, business, higher education, and community organizations.⁴⁸ With a \$65 million award from the Economic Development Administration and \$32 million from the state government, DRIVE launched the Fresno-Merced Farms Food Future (F3) Coalition. F3 is helping entrepreneurs and innovators to develop new ag technology, advance technology testing and adoption of regenerative farming practices among farmers to grow food sustainably, and training workers in partnerships with community colleges and other organizations to improve their productivity and connect them to good jobs.⁴⁹ Likewise, BEAM Circular, based in the San Joaquin Valley, endeavors to support circular bioeconomic innovation in the Central Valley through a portfolio of public-private projects in industrial biomanufacturing that is articulated to the Stanislaus 2030 economic development planning initiative.⁵⁰

7.5 Closing the gap: Transforming theory into practice

It is important to acknowledge that the bioeconomy does not try to force inland regions to become something they are not. Instead, it leverages what they already have — land, agriculture, a large workforce — in a way that the knowledge economy of the past three decades did not, and in so doing creates a new model for economic development.

Turning inland agricultural assets into economic advantages. Inland California's agricultural dominance — which has historically meant low-wage farmwork — can become a strategic asset in a bioeconomy that needs biological feedstocks, land, and farming infrastructure. Rather than competing with the coast on its own terms, inland regions can specialize in supplying the raw materials and manufacturing capacity that a bioeconomy demands.

Creating coastal-inland synergies. Coastal California's strengths in AI, life sciences, and tech innovation can be paired with inland California's agricultural base and available land. Coastal innovation develops the technologies; inland regions provide the biological inputs and manufacturing scale. Both can benefit from the bioeconomy rather than one region growing at the other's expense.

Generate better-paying inland jobs. As noted, a core problem is that inland regions emphasize low-wage sectors — agriculture, logistics, and retail — while the coast captures professional and technical employment. Bioindustrial manufacturing, agtech, clean energy, and food processing are ways to create higher-wage employment in inland communities without requiring workers to relocate to coastal cities, thus fostering opportunities for economic development and mobility in their local communities.

Workforce development through regional institutions. Fresno DRIVE and the F3 Coalition, along with UC Merced, UC Davis and UC Riverside and the state university system, are models that connect community colleges, research institutions and training programs directly to bioeconomic industries and can build human capital pipelines in place, enabling inland residents

⁴⁸ [Washburn, Owen. 2025. How Fresno, California's civic and philanthropic leaders catalyzed inclusive, tech-driven economic growth. Brookings Institution.](#)

⁴⁹ <https://www.f3initiative.org/>

⁵⁰ <https://www.beamcircular.org>

to access better-paying careers without leaving their regions — addressing the educational attainment gap that currently disadvantages inland workers.

Regional specialization through the state economic blueprint. California's development blueprint explicitly maps the bioeconomy as a priority for all inland regions and identifies complementary sectors like agtech, biotech, food processing, and clean energy that align with what inland regions already do. This gives inland areas a framework to attract investment and build specialized clusters rather than chasing industries with no natural local fit.

Applied research infrastructure placed in inland regions. The creation of a facility modeled on Kalundborg Helix Lab in Denmark would create a research and education center designed to strengthen collaboration between industry and academia. It could be linked with a research facility founded at UC Berkeley. Such a collaboration would address the historical pattern which concentrates research institutions and the economic activity they generate on the coast.

Addressing climate threats that disproportionately harm inland economies. As noted above declining snowpack, water scarcity, and heat stress threaten inland agriculture. Bioeconomy solutions — regenerative farming, water-efficient crops, climate-adapted agricultural technologies — can help inland regions adapt their primary industry rather than watch it deteriorate, preventing a widening of the gap through agricultural collapse.

7.6 Conclusions and recommendations

This chapter has identified many of California's shortcomings, many of which have been in building for years. The state stands at a critical juncture where its greatest challenges may also present its most significant opportunities. The bioeconomy offers a promising pathway to simultaneously address the state's environmental imperatives while bridging the widening economic divide between coastal and inland regions. Success, however, will require deliberate action and sustained commitment.

Several key insights emerge from this analysis. First, California's regional disparities are profound and worsening. The 2.5-fold increase in Bay Area per capita income since 1998 compared to just 1.5 times growth in inland regions reflects fundamental differences in economic structure, human capital, and access to high-wage employment. These gaps manifest not only in income but in poverty rates, educational attainment, and economic opportunity, creating a two-tier state that undermines California's promise of prosperity for all.

Second, the bioeconomy represents a unique convergence of California's strengths—world-class research institutions, agricultural dominance, technological leadership, and climate policy commitment. The state's existing advantages in life sciences, AI, clean energy, and agricultural innovation position it to lead the global bioeconomic transition. Critically, this transition need not be a zero-sum game between regions. Instead, coastal areas' technological prowess and inland regions' agricultural assets and manufacturing capacity create natural synergies that could benefit the entire state.

Third, institutional frameworks matter tremendously. California's carbon neutrality goals, regional economic development blueprint, and initiatives like the Circular Bioeconomy Innovation Collaborative and Fresno DRIVE demonstrate that the necessary policy architecture is emerging. However, the pace and

coordination of these efforts must accelerate. The bioeconomy transition will not wait for perfect planning, and regions that move quickly to build capabilities, attract investment, and develop specialized ecosystems will capture disproportionate benefits.

Fourth, the urgency is real. Climate change threatens California's agricultural foundation through declining snowpack, increasing heat stress, and water scarcity. Federal policy uncertainty around trade, immigration, and climate action adds further pressure. The state's aging population and workforce challenges compound these issues. Without bold action, existing disparities will likely deepen, exacerbating social tensions and undermining the state's economic competitiveness.

The path forward requires several critical commitments. State government must move swiftly to facilitate capability building, resource access, and regional ecosystem development. This means investing in education and workforce training aligned with bioeconomy needs, ensuring infrastructure supports new industries, and creating regulatory frameworks that enable rather than hinder innovation. Regional coordination is essential—local stakeholders must work together to identify comparative advantages, attract complementary investments, and build specialized clusters that can compete globally.

Importantly, the bioeconomy must deliver tangible benefits to working Californians, particularly in inland regions. This means creating not just jobs, but good-paying jobs with benefits and advancement opportunities. It means ensuring that agricultural workers and communities benefit from sustainable farming innovations rather than being displaced by them. It means connecting educational institutions with industry needs so that inland residents can access pathways to high-wage careers without leaving their communities.

California has both the obligation and the opportunity to demonstrate that environmental sustainability and inclusive prosperity are not competing goals but complementary imperatives. The bioeconomy provides the framework for this demonstration. Whether the state seizes this moment will depend on its willingness to act decisively, coordinate effectively across regions and sectors, and maintain focus on the twin objectives of environmental stewardship and broadly shared economic advancement. The stakes—for California's people, its economy, and its leadership role—could not be higher.