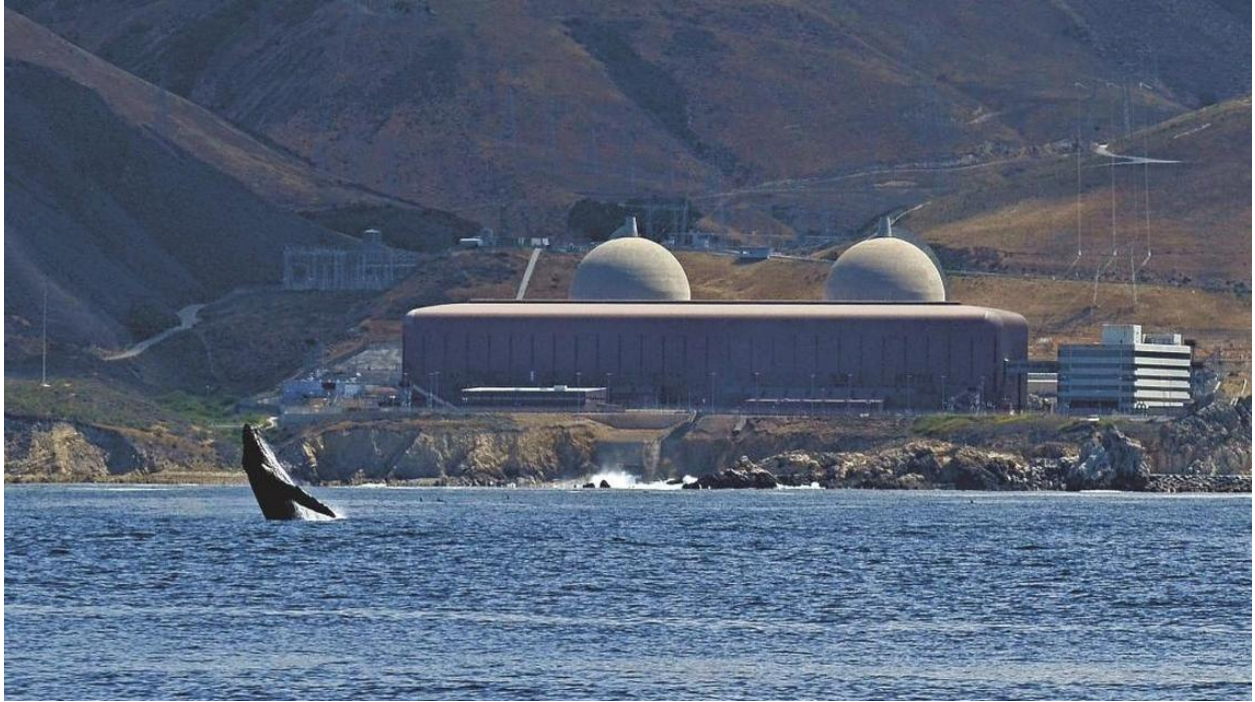

Extending Service for the Diablo Canyon Nuclear Power Plant



Economic Impact Assessment

Prepared for:

Pacific Gas and Electric Company

Prepared by:

David Wells Roland-Holst, Drew Behnke, Samuel Neal, Johnathan Chang

Berkeley Economic Advising and Research, LLC www.bearecon.com

July 28, 2026

© All rights reserved.

Pacific Gas and Electric Company

The authors thank many PG&E staff for helpful discussions and information support, but retain responsibility for any errors or omissions. The views expressed in this paper are those of the authors and do not necessarily reflect the views and policies of Pacific Gas and Electric, California State agencies, or San Louis Obispo County public agencies. PG&E does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use.

 Printed on recycled paper

Executive Summary

Operations of the Diablo Canyon Nuclear Power Plant (DCPP) were extended through 2030 in response to the growing risk of electricity shortfalls and blackouts, and slower-than-expected deployment of replacement renewable energy. As a matter of diligence to support its strategic planning, stakeholder engagement, and public information, PG&E commissioned this assessment of the expected impacts of extended DCPP operation on the local, state, and regional economy.

This assessment makes two primary contributions to strategic planning, public and private information, and constructive energy policy dialog. The first of these is informational - a general overview of economic issues related to extension DCPP operations. This occupies much of the narrative background in the report. The second contribution is technical - a rigorous analysis of three main dimensions of DCPP impact on the local and state economies. The findings of the technical analysis are summarized here.

Economic Impact Assessment

Generally, this economic impact assessment finds that DCPP operations are a potent and inclusive catalyst for growth. Our analysis shows how DCPP operations confer and diverse and significant array of economic benefits across their host counties and the state economy generally. Using the latest and most detailed data available, combined with advanced economic impact assessment tools, it demonstrates how continued operation of DCPP will create hundreds of millions of dollars in additional income and support thousands of jobs outside the energy sector. Moreover, regardless of the status of prior DCPP targeted tax and prior fee arrangements, DCPP operations contribute (directly and indirectly) more than \$80 million in combined state and local taxes and over \$160 million in Federal taxes.

DCPP and the San Luis Obispo Economy

Given that facility spending is concentrated almost entirely within San Luis Obispo County, it comes as no surprise that the largest effects are to be seen here. In Table ES1, total value added or Gross State Product (GSP) from the sector is estimated at roughly \$317 million per year, while the impact on overall SLO GSP is estimated to be \$420 million per year. The largest impacted sectors are spread across those affected from payrolls, nonlabor input demand, etc. Most of the multiplier effects are induced (\$100 million) rather than indirect (about \$3 million), passing through payrolls and contracting to local real estate and other services (e.g. homeownership and real estate, restaurants, medical). This imbalance is to be expected for a highly specialized technical facility like DCPP,

where payrolls are the primary linkage to local markets, and it highlights the importance of recognizing so called general equilibrium economic impacts.

Table ES1: Total Annual Economic Impact of Extending DCPD Operations, San Luis Obispo County (Annual change in Industry value-added in 2023 Dollars)

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	Utilities	\$ 316,501,947	\$ 1,910,239	\$ 698,391	\$ 319,110,576
2	RealEstate	\$ -	\$ 79,691	\$ 29,336,741	\$ 29,416,433
3	HealthCare	\$ -	\$ 7	\$ 15,661,659	\$ 15,661,667
4	RetailTrade	\$ -	\$ 33,362	\$ 15,048,387	\$ 15,081,749
5	Hospitality	\$ -	\$ 34,612	\$ 9,085,946	\$ 9,120,558
6	OthPrivServ	\$ -	\$ 15,347	\$ 5,701,539	\$ 5,716,886
7	FinInsurance	\$ -	\$ 128,473	\$ 4,718,436	\$ 4,846,909
8	WhlSalTrade	\$ -	\$ 68,710	\$ 4,029,447	\$ 4,098,157
9	ProfSciTech	\$ -	\$ 289,455	\$ 3,516,318	\$ 3,805,774
10	Information	\$ -	\$ 77,433	\$ 2,611,156	\$ 2,688,589
11	WasteMgmt	\$ -	\$ 160,423	\$ 2,220,447	\$ 2,380,870
12	Transport	\$ -	\$ 103,983	\$ 1,860,372	\$ 1,964,356
13	ArtEntRec	\$ -	\$ 3,838	\$ 1,911,634	\$ 1,915,472
14	Education	\$ -	\$ 421	\$ 1,242,468	\$ 1,242,888
15	Construction	\$ -	\$ 75,092	\$ 917,721	\$ 992,813
16	Manufacturing	\$ -	\$ 55,246	\$ 868,606	\$ 923,852
17	GovtEnt	\$ -	\$ 12,306	\$ 533,424	\$ 545,730
18	MgmtEnt	\$ -	\$ 4,150	\$ 347,451	\$ 351,601
19	AgForFsh	\$ -	\$ 447	\$ 218,224	\$ 218,671
20	MiningMin	\$ -	\$ 9,345	\$ 65,923	\$ 75,268
21	Non-NAICS	\$ -	\$ -	\$ -	\$ -
22	PubAdmin	\$ -	\$ -	\$ -	\$ -
	Total	\$316,501,947	\$3,062,580	\$100,594,290	\$420,158,818

Figure ES1: Total Annual Economic Impact of Extending DCPD Operations, San Luis Obispo County, (2023 Dollars Annually)

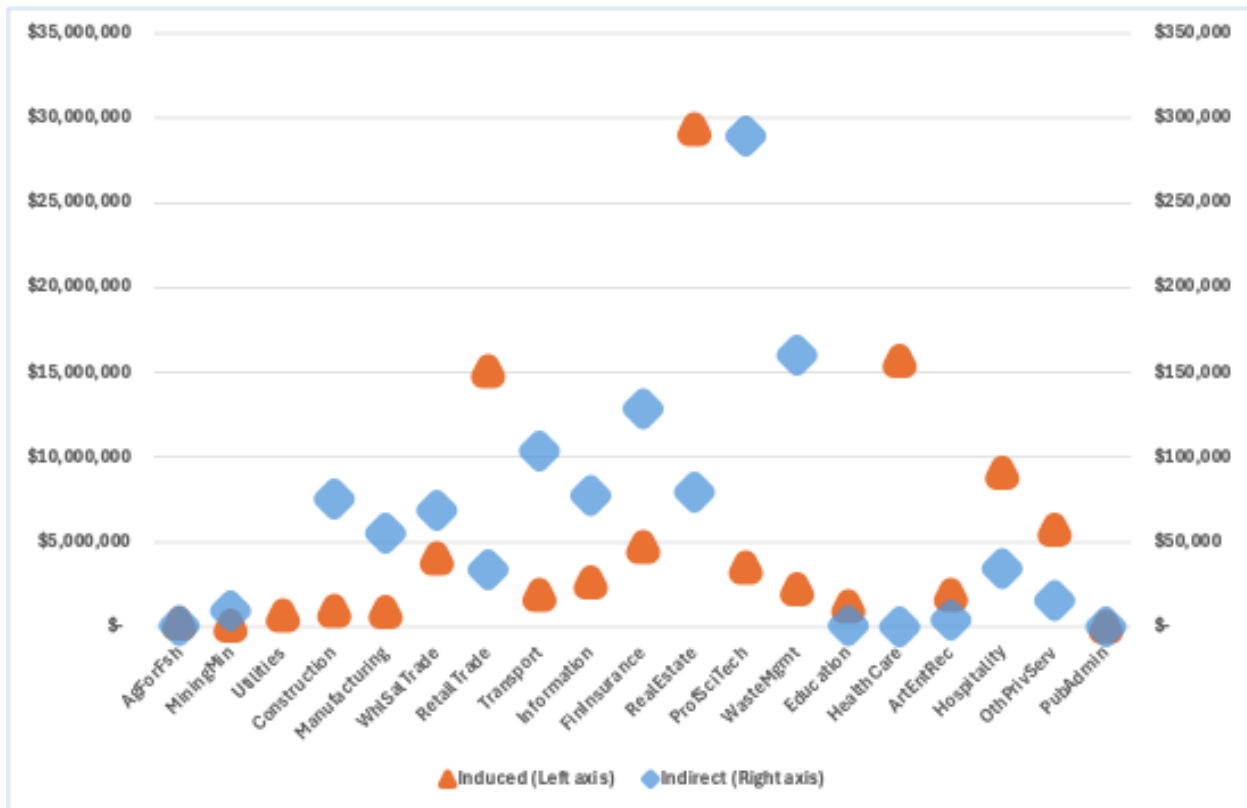


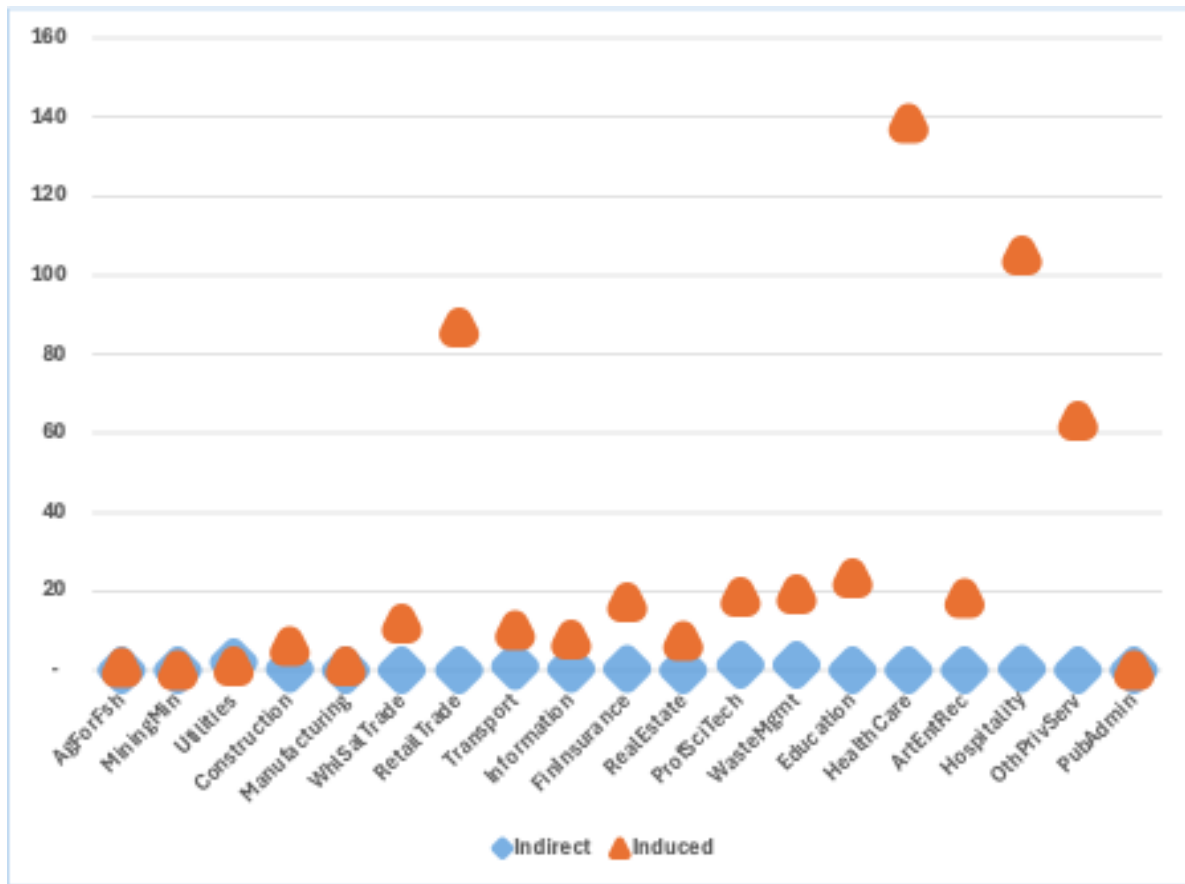
Figure ES1 illustrates the diverse impacts of DCPD operations, order this time by sector rather than magnitude. Because induced impacts are so much greater than indirect ones, two difference vertical scales are used. Adjusting for this average difference, however, the great diversity of DCPD’s beneficial economic spillovers is quite apparent. The facility’s primary service might be provision of clean electric power, but its local benefits are significant and quite extensive across the local economy.

Regarding job creation, we find widespread benefits impacts for San Luis Obispo County. Table ES2 suggests that DCPD is responsible for increases in direct employment in its own operations, but also for about 54% more new jobs linked to “upstream” suppliers (about 1%) and “downstream” services (53%). Full accounting of payroll and other expenditures identifies at least 1,015 FTE jobs directly associated with facility expense, while another 551 FTE jobs are supported annually by indirect and induced economic stimulus from DCPD. Induced job creation is primarily in service sectors, which is a logical payroll multiplier effect. In California, 70% of GSP is household consumption and 70% of household consumption is for services. In a post-industrial economy like ours, about half (49%) of our income is spent on service sectors. This means that, although DCPD employees represent higher than average income households, their spending stimulates much more inclusive economic opportunity across the region.

**Table ES2: Total Annual Jobs Impact of Extending DCPD Operations,
San Luis Obispo County (Change in Industry FTE Employment in 2023 Dollars)**

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	Utilities	1,015.72	2.19	1.20	1,019.11
2	RealEstate	-	1.44	18.60	20.04
3	HealthCare	-	1.32	19.31	20.63
4	RetailTrade	-	0.92	10.27	11.20
5	Hospitality	-	0.44	6.04	6.48
6	OthPrivServ	-	0.41	17.20	17.61
7	FinInsurance	-	0.40	105.00	105.40
8	WhlSalTrade	-	0.25	7.81	8.06
9	ProfSciTech	-	0.18	11.93	12.10
10	Information	-	0.15	7.50	7.66
11	WasteMgmt	-	0.13	86.85	86.98
12	Transport	-	0.09	4.04	4.12
13	ArtEntRec	-	0.08	62.98	63.06
14	Education	-	0.06	1.15	1.20
15	Construction	-	0.03	2.55	2.58
16	Manufacturing	-	0.01	18.18	18.20
17	GovtEnt	-	0.01	23.35	23.35
18	MgmtEnt	-	0.01	0.03	0.04
19	AgForFsh	-	-	0.75	0.75
20	MiningMin	-	-	138.43	138.43
21	Non-NAICS	-	-	-	-
22	PubAdmin	-	-	-	-
	Total	1,015.72	8.12	543.17	1,567.00

Figure ES2: FTE Annual Jobs Impact of Extending DCPD Operations, San Luis Obispo County (Change in Industry Employment in 2023 Dollars)



The following tables and figures summarize DCPD’s fiscal impacts on the SLO economy. Despite the uncertainty surrounding the Unitary Tax, it is clear from these results that DCPD makes very substantial contributions to public finances at the local, state, and national levels. Table ES3 reports total state revenue, and here that, as a result of the stimulus originating with DCPD and generating new GSP across the SLO economy, payroll taxes will increase by over \$1.7 million and producer taxes by over \$26 million. Meanwhile, SLO households will pay over \$8 million and enterprises over \$22 million in state and local income taxes as a direct, indirect, and induced result of DCPD operations. In summary, state and local coffers take in about \$59 million more every year because of DCPD operations.

At the Federal level, incremental revenue from SLO sources linked to DCPD are even larger, comprising \$45 million in social insurance taxes, \$1.3 million in production taxes, \$32.2 and \$1.8 million from Household and Corporate income taxes, respectively. The total Federal fiscal contribution attributable to DCPD operations is over \$80 million annually, and this takes no account of systemwide fees on DCPD power output.

Table ES3: State and Local Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax- Employee Contribution	\$ 808,101			\$ 808,101	\$ 1,616,202
Social Insurance Tax- Employer Contribution	\$ 950,193			\$ 950,193	\$ 1,900,386
TOPI: Sales Tax		\$ 12,397,026		\$ 10,020,370	\$ 22,417,396
TOPI: Property Tax		\$ 12,077,093		\$ 349,087	\$ 12,426,180
TOPI: Motor Vehicle License		\$ 305,238		\$ 303,271	\$ 608,508
TOPI: Severance Tax		\$ 12,282		\$ 12,282	\$ 24,565
TOPI: Other Taxes		\$ 1,513,622		\$ 703,837	\$ 2,217,459
TOPI: Special Assessments		\$ 298,158			\$ 298,158
OPI: Corporate Profits Tax				\$ 949,442	\$ 949,442
Personal Tax: Income Tax			\$ 8,219,581	\$ 8,219,581	\$ 16,439,162
Total State and Local Tax Payments	\$ 1,758,294	\$ 26,603,419	\$ 8,219,581	\$ 22,316,164	\$ 58,897,457

Figure ES3: State and Local Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)

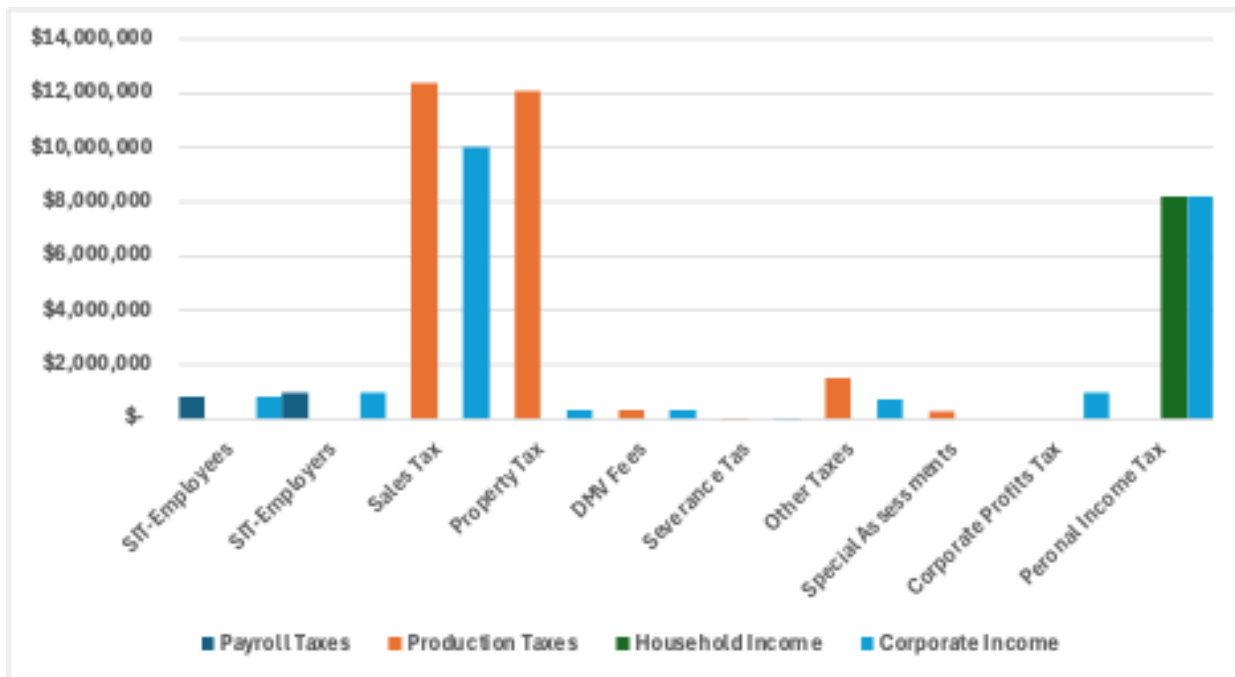
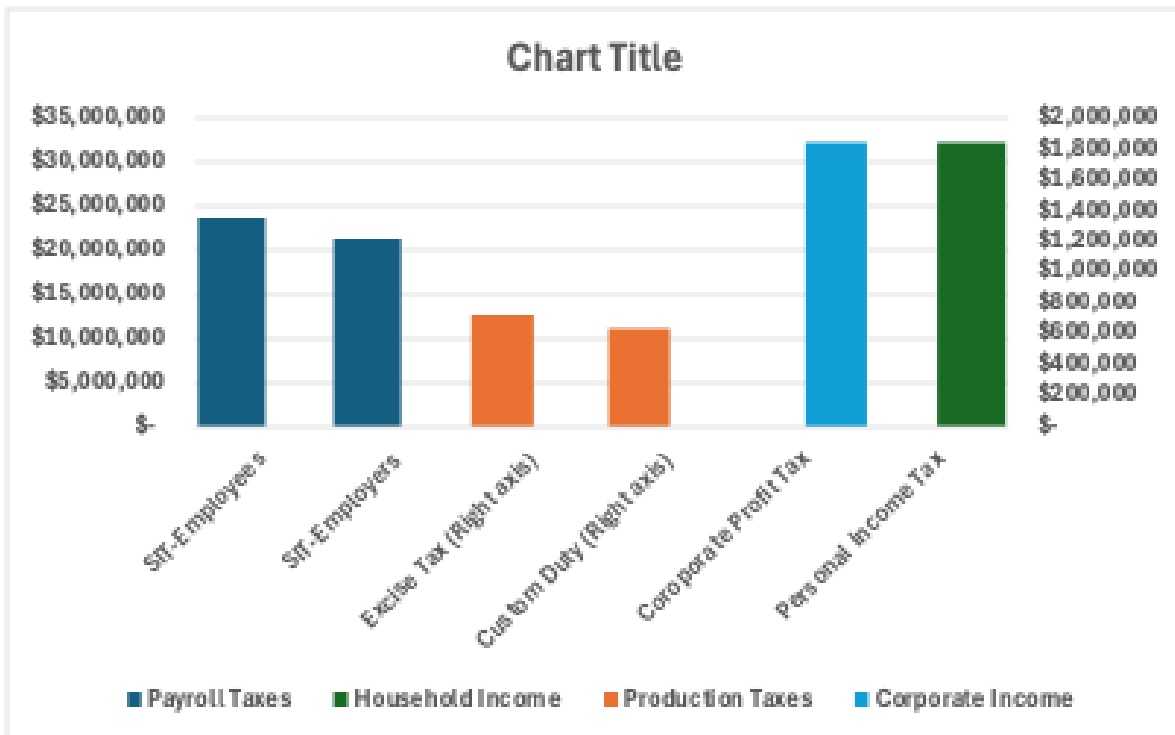


Table ES4: Federal Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax- Employee Contribution	\$ 23,704,197				\$ 23,704,197
Social Insurance Tax- Employer Contribution	\$ 21,327,718				\$ 21,327,718
TOPI: Excise Taxes		\$ 726,161			\$ 726,161
TOPI: Custom Duty		\$ 640,117			\$ 640,117
OPI: Corporate Profits Tax				\$ 1,841,214	\$ 1,841,214
Personal Tax: Income Tax			\$ 32,158,246		\$ 32,158,246
Total Federal Tax Payments	\$ 45,031,915	\$ 1,366,278	\$ 32,158,246	\$ 1,841,214	\$ 80,397,652

Figure ES4: Federal Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)



Turning now to the same assessment for Santa Barbara (SB), the results are qualitatively similar but much smaller for two reasons. Firstly, this county's population of DCPD workers is much smaller than SLO and facility linkages to the SB economy are much less extensive. Technically, this means that all three categories of effects are smaller, Direct effects because of a smaller constituency and indirect/induced effects because of weaker economic links to operations. Having said this the results remain economically important, with DCPD operations generating direct income of \$32 million and indirect or induced income of \$11.7 million every year.

Since payrolls are the main source of DCPD stimulus here, the importance of indirect and induced effects is even more important. For SLO, these multiplier effects were 31% the magnitude of direct effects, while the corresponding figure for SB is 37%. Thus we see significantly more diverse stimulus across the SB local economy, but in terms of income and employment effects. Summarized in Table @, the latter show that about half an additional FTE job is created in SB for every DCPD job holder residing in the county. Moreover Figure @ reveals again that the diversity of this robust indirect and induced job creation, with services again dominating.

From a fiscal perspective, DCPD contributions to state and Federal coffers via the SB "channel" are smaller because the primary stimuli, project expenditures, is almost exactly 10% (\$31,925,950 vs \$321,128,165) that applied to SLO. Even so, fiscal revenues follow a very similar pattern and are by no means trivial at the state (\$2.3 million) or Federal (\$8.2) million. Again, these revenues take no account of fees or other taxes assessing on DCPD power production and delivery.

Table ES 5: Impacts on Santa Barbara County

	Direct	Indirect	Induced	Total	
GSP	\$ 32,142,689	\$ 207,836	\$ 11,532,055	\$ 43,882,580	
Employment (FTE)	141.00	0.67	67.19	208.82	
	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
State Taxes	\$ 191,644	\$ 1,093,679	\$ 890,443	\$ 86,454	\$ 2,262,219
Federal Taxes	\$ 4,614,078	\$ 39,211	\$ 3,376,780	\$ 167,656	\$ 8,197,725

Table ES6: Impacts on the State of California

	Direct	Indirect	Induced	Total	
GSP	\$ 601,337,577	\$ 222,138	\$ 299,709,843	\$ 901,269,558	
Employment (FTE)	141.00	0.67	67.19	208.82	
	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
State Taxes	\$ 191,644	\$ 1,093,679	\$ 890,443	\$ 86,454	\$ 2,262,219
Federal Taxes	\$ 4,614,078	\$ 39,211	\$ 3,376,780	\$ 167,656	\$ 8,197,725

Logically, San Luis Obispo County has the most to gain from DCPD operations in relative terms, while Santa Barbara experiences qualitatively similar but smaller gains because its local direct income from DCPD is about 10% that of SLO. Having noted this, the state economy captures much larger benefits than the two counties combined because DCPD operations are intimately linked across PG&E's systemwide transmission and marketing services. The result is total economic benefits to the rest of the state are even larger than in SLO and SB combined, generating \$901 million in additional GSP and over 3,800 additional jobs. In other words, DCPD operations generate roughly \$3 of California income for every dollar of its own operating cost and over two additional FTE jobs for every one of its own production workers. Thus DCPD is not only the largest single producer of clean power in California, it is a rich source of private and public income and opportunity.

Real Estate Market Assessment

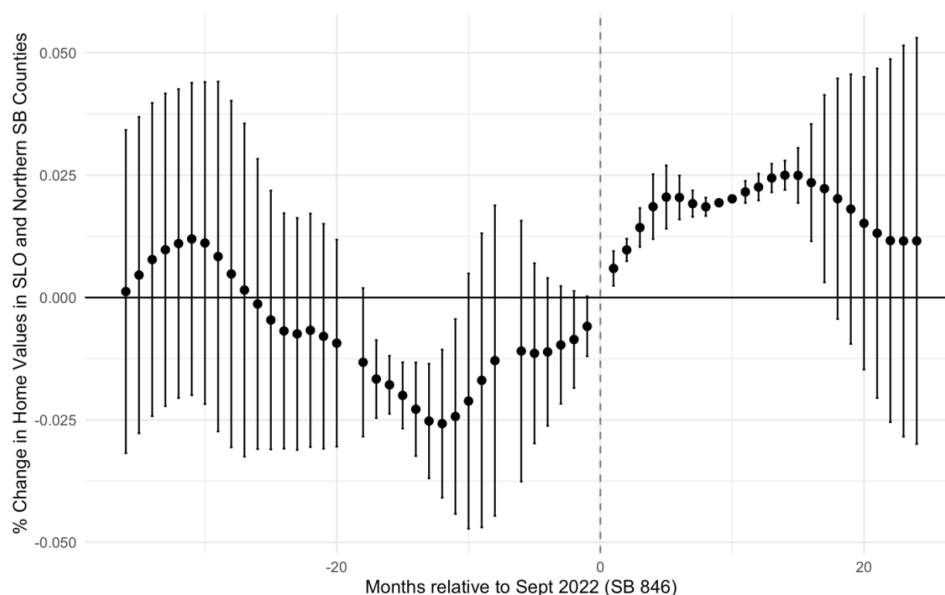
Because it is a major local employer with relatively high wage workers, DCPD operations have important spillover effects on property values. For this reason, every significant economic assessment of DCPD operations has addressed the issue of real estate market effects. This section reviews the general issues involved and presents a more technical analysis to support generally positive conclusions regarding DCPD's contribution to sustaining property values, the core asset for most American households. The same forces also support provision of many public and private goods and services associated with higher value residential communities.

Our real estate market assessment combined trend analysis with an event study, and both yielded consistent results. For the event study, the analysis is presented below in Figure X. The X-axis represents months relative to the September 2022 announcement. Each dot represents the estimated difference in home values between San Luis Obispo and Northern Santa Barbara and Monterey and Ventura for that relative month. The vertical dashed line is September 2022 which represents our baseline period which all other months are compared to. The horizontal line at 0 represents no announcement

effect. In other words, if a dot is on this line, it means that home values in San Luis Obispo and Northern Santa Barbara did not behave differently in that month relative to those in Monterey and Ventura. Each dot has an error bar which represents the 95% confidence interval. This means if the bar crosses the horizontal line at 0 the effect is not statistically significant at conventional levels.

The event study demonstrates several things. First, we find support that San Luis Obispo and Northern Santa Barbara home values exhibit a parallel trend to those in Monterey and Ventura before the announcement. The dots hover around zero, and while there is some noise, the majority of results are not statistically significant. Second, immediately after the announcement, we find that home values in San Luis Obispo and Northern Santa Barbara increased in value more than those in Monterey and Ventura. The magnitudes represent a roughly 1.5 – 2.5% and are statistically significant. Finally, in the longer run (~18 months) the effect appears to flatten and then dissipate. This suggests that the market may have absorbed the announcement with little persistent gap to the comparison group. Overall, the event study suggests a short-lived increase in home values in San Luis Obispo and Northern Santa Barbara from the announcement, before eventually tapering off.

Figure ES5: Event Study Analysis



Utilizing a so-called difference-in-differences model, we find causal evidence that following the closure announcement, yield spread of bonds in SLO County increased 0.26 percentage points (26 basis points) more than bonds issued by comparable counties.¹ This provides strong evidence that the market believed that SLO County showed

¹ We include controls for income, county, distance, trade time, and trade volume. P-value = 0.001, which is very statistically significant

increased risk following PG&E's announcement to shut down DCP. This result is consistent and remains statistically significant even when we use different combinations of controls variables.

Our initial econometric analysis found a short-lived increase in home values in San Luis Obispo and Northern Santa Barbara following the SB 846 announcement, and these effects taper off within 18 months. This is consistent with a second, more rigorous analysis that finds no statistically significant long-run average effect of the announcement on local housing values. These effects overall are consistent with prior research that finds property value impacts from nuclear plants vary depending on local housing market conditions. In weaker housing markets, concerns about nuclear facilities can depress values, but in high-demand locations, housing scarcity may outweigh such concerns. San Luis Obispo and the surrounding coastal California areas represent one of the most desirable real estate markets in the country, suggesting that the premium attached to living in this area likely dominates any potential stigma associated with DCP. In addition, the plant provides stable employment and local economic activity, which could further offset negative perceptions. Taken together, the evidence indicates that DCP's continued operation has not had a discernible impact on local housing values.

Bond Market Assessment

Among the many potential economic impacts of the prospective DCP closure, one of the most scrutinized was its fiscal implications for the various government institutions of San Luis Obispo County. When economic sentiment about a regional economy turns negative, bond markets react by pricing higher anticipated risk into bond rates. In some cases, the effects of this on overall public budgets can be greater than the loss of individual revenue sources. Because the cost of capital affects the entire budget of local public entities, these "second order" risk effects are potentially as significant as the direct, indirect, and induced revenue impacts of the DCP closure. Conversely, the continued operation of a large and economically robust, high income employer can improve investor sentiment and lower bond rates in local markets.

And indeed, we observe a general increase in yield spread when we look at counties not directly affected by event announcement (see Figure 4). Thus, in order to determine whether there was an additional increase for bonds within SLO County, relative to the comparison counties which should be relatively unaffected by this announcement, it is important to use the difference-in-differences technique mentioned previously.

Figure ES6: Change in bond risks within SLO County, as measured by bond yield spread

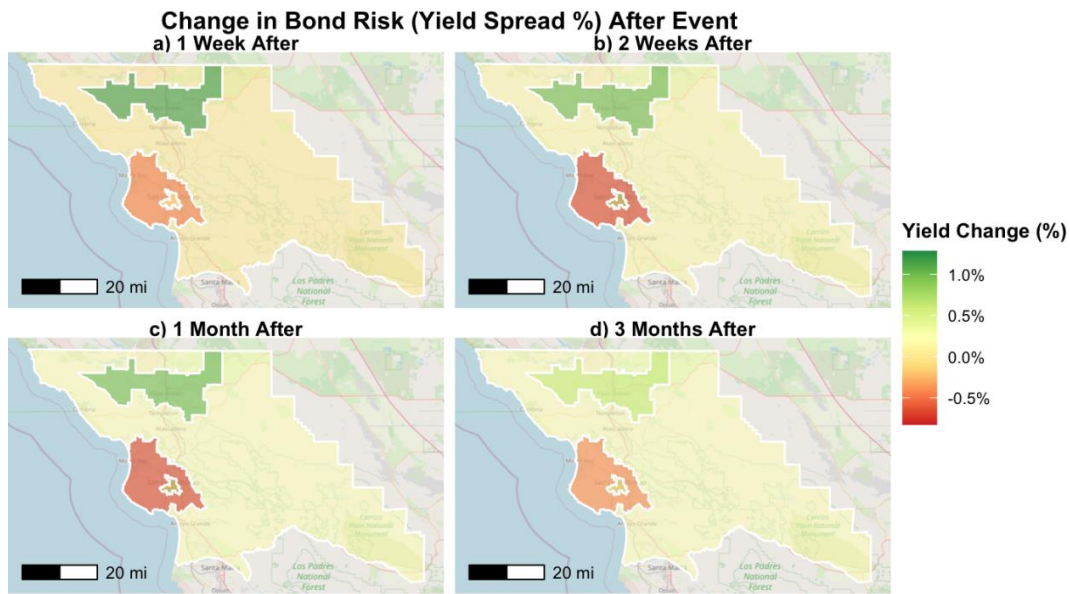
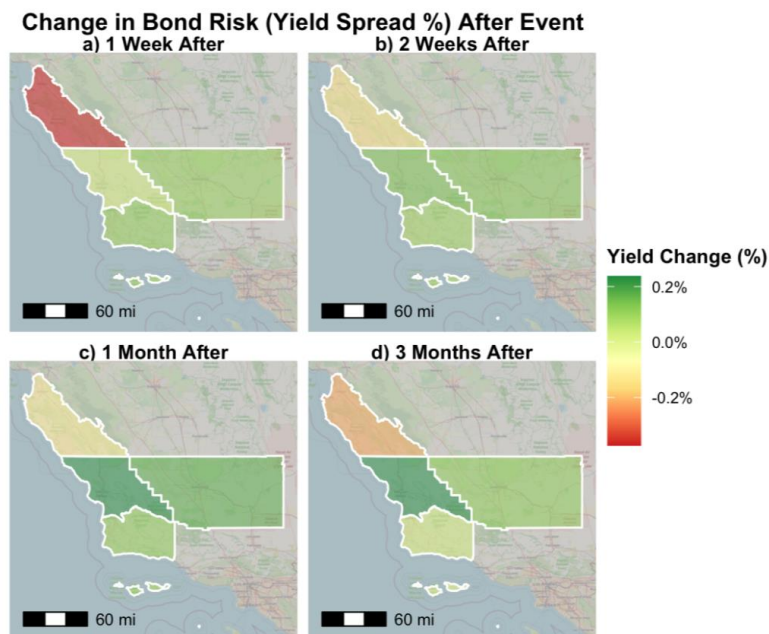


Figure ES7: Change in bond risk outside SLO County, as measured by bond yield spread



Our rigorous statistical analysis study finds that the DCPD closure announcement led to a measurable increase in the perceived fiscal risk for municipal issuers in San Luis Obispo County, translating to an estimated 24-basis-point increase in their cost of capital. While this effect is statistically significant, the magnitude is modest. The market appears to have priced in a specific, county-level risk premium rather than a geographically widespread shock. These findings suggest that while the closure announcement was not completely fiscally neutral, the market did not anticipate a significant deterioration in the region's

credit quality at the time of the announcement. Conversely, our results suggest that extending operations will continue to support a favorable local investment climate, with competitive public capital costs and strong balance sheets.

Contents

Executive Summary	- 3 -
Economic Impact Assessment.....	- 3 -
Real Estate Market Assessment	- 11 -
Bond Market Assessment	- 13 -
Economic Impact Assessment	- 19 -
1 Introduction	- 19 -
1.1 Factors Prompting Extension of Power Services	- 19 -
1.2 Historical Background	- 21 -
1.3 Overview of DCPD and its operations.....	- 22 -
1.4 Diablo Canyon Power Plant Generation	- 25 -
1.5 National and State Electricity Generation.....	- 27 -
1.6 Emergent Trends in Electricity Demand	- 29 -
2 An overview of DCPD operations	- 34 -
2.1 Employment and Workforce.....	- 34 -
2.2 Expenditures on Goods and Services.....	- 41 -
2.3 Operational Costs	- 43 -
2.4 Property Tax.....	- 47 -
2.5 Operating Revenues	- 48 -
3 General Economic Impact Assessment	- 51 -
3.1 Approach.....	- 51 -
3.2 Methodology	- 52 -
3.3 Data Requirements	- 53 -
3.4 Results.....	- 61 -
3.5 Conclusions	- 82 -
4 Real Estate Market Assessment.....	- 83 -
4.1 General Considerations	- 83 -
4.2 Analysis	- 84 -
4.3 Results.....	- 88 -

4.4	Conclusion.....	- 92 -
5	Bond Market Assessment.....	- 94 -
5.1	Approach.....	- 94 -
5.2	Data	- 95 -
5.3	Methodology	- 97 -
5.4	Results.....	- 98 -
5.5	Conclusion.....	- 101 -
6	Conclusions of the Economic Impact Assessment.....	- 102 -
6.1	Economic Impact Assessment.....	- 102 -
6.2	Real Estate Market Assessment.....	- 102 -
6.3	Bond Market Assessment.....	- 103 -
7	Recommendations.....	- 104 -
8	Extensions of the Present Analysis	- 107 -
8.1	Extended Energy Services	- 107 -
8.2	Complementary Local Services	- 109 -
8.3	Resource Services.....	- 109 -
9	References	- 112 -
10	Appendix 1 – The Volumetric Performance Fee	- 113 -
10.1	Adjustment potential	- 113 -
10.2	Purpose and use of fees	- 113 -
10.3	Mandatory spending and reporting.....	- 114 -
10.4	Spending hierarchy and limitations.....	- 114 -
10.5	Other VPF Use Cases	- 114 -
10.6	Examples of projects funded by the VPF	- 115 -
10.7	Oversubscription and cost overruns	- 116 -
10.8	VPF Impacts on Rates	- 117 -
10.9	Broader cost landscape.....	- 118 -
11	Appendix 2 – Estimating Indirect, and induced economic impacts of DCP operations.....	- 119 -

Abbreviations

BEAR - Berkeley Economic Advising and Research
CAISO - California Independent System Operator
CARB - California Air Resources Board
CEC - California Energy Commission
CED - California Energy Demand Forecast
CHP - Combined Heat and Power
CPUC - California Public Utilities Commission
DCPP - Diablo Canyon Power Plant
DR - Demand Response
EV - Electric Vehicle
GHG - Greenhouse Gases
IOU - Investor Owned Utility
LCR - Local Capacity Requirement
LSE - Load Serving Entity
LTPP - Long Term Procurement Plan
PG&E - Pacific Gas and Electric
POU - Publicly Owned Utility
PPP – Public Private Partnership
PV - Photovoltaic
RPS - Renewables Portfolio Standard
SCE - Southern California Edison
SDG&E - San Diego Gas & Electric
SLO - San Luis Obispo
WECC - Western Electricity Coordinating Council

Prospective Closure of the Diablo Canyon Nuclear Power Plant

Economic Impact Assessment

1 Introduction

Operations of the Diablo Canyon Nuclear Power Plant (DCPP) were extended through 2030 in response to the growing risk of electricity shortfalls and blackouts, and slower-than-expected deployment of replacement renewable energy. As a matter of diligence to support its strategic planning, stakeholder engagement, and public information, PG&E commissioned this assessment of the expected impacts of extended DCPP operation on the local, state, and regional economy.

1.1 Factors Prompting Extension of Power Services

The decision to extend operations reversed a 2016 agreement between the plant's operator, PG&E, and a coalition of environmental and labor groups to shut the plant down by 2025. The key factors that led to the extension included the following:

- **Grid reliability concerns:** California experienced grid instability and rolling blackouts during extreme heat waves in 2020 and 2022, which highlighted the vulnerability of the state's energy supply.

Diablo Canyon provides a significant and stable baseload and is the largest single source of clean energy in California, accounting for nearly 10% of the state's electricity generation.

- **Slow deployment of renewables:** The state's transition to new renewable energy and storage projects was not progressing as quickly as planned, exacerbated by global supply chain disruptions, inflation, and permitting delays. The California Energy Commission (CEC) found that by 2022, almost 40% less renewable capacity came online than expected.
- **Impact of climate change:** Increasing temperatures and extreme weather events have amplified the stress on California's energy system. Droughts have threatened hydropower generation, and wildfires have damaged transmission lines, further destabilizing the grid.

- **Clean energy goals:** While originally viewed as a step toward a renewable-only future, state officials began to reframe Diablo Canyon's carbon-free nuclear power as a vital "bridge" resource to help meet aggressive clean energy and climate goals by 2045.
- **Federal incentives:** The potential availability of federal funding from the Department of Energy's Civil Nuclear Credit Program made the extension more financially viable and helped offset some costs.

Timeline of key events

- **2016:** PG&E and a coalition of environmental and labor groups announced an agreement to retire the plant by 2025.
- **2020 & 2022:** Heat waves and grid shortfalls caused rolling blackouts, spurring renewed concerns over energy reliability.
- **August 2022:** Governor Gavin Newsom proposed extending Diablo Canyon's operational life, citing the urgent need for reliability during the state's clean energy transition.
- **September 2, 2022:** Governor Newsom signed Senate Bill 846 into law, providing a pathway and initial funding for extending the plant's operations until 2030.
- **December 2022:** The California Public Utilities Commission (CPUC) voted to invalidate the previous retirement decision and formally direct PG&E to pursue the extension.
- **November 2023:** PG&E filed an application with the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses for Diablo Canyon's two units.
- **December 2023:** The CPUC authorized the extension of operations through 2030, contingent on NRC approval.
- **August 2025:** The NRC approved the license extension, and Diablo Canyon officially entered its extended operational period.

1.2 Historical Background

The area surrounding the Diablo Canyon Nuclear Power Plant has a rich and complex history shaped by natural features and human activity, from the Indigenous cultures that thrived before European contact to the significant transformations brought about by colonization and modern energy infrastructure. This history reflects both the environmental significance of the landscape and the changes resulting from human interactions with it over centuries.

1.2.1 *Geology and Physical Geography*

The Diablo Canyon area is characterized by a unique geological landscape shaped by tectonic activity, coastal processes, and diverse ecosystems.

- **Geological Features:** The region is located along the Pacific Coast of California and is influenced by the San Andreas Fault system. The area's geology consists of sedimentary rock formations, including sandstone and shale. The rugged coastline has been sculpted by tectonic subduction (the Pacific Plate being driven under the Continental Plate), erosion and wave action.
- **Physical Geography:** The Diablo Canyon is characterized by steep coastal cliffs, rolling hills, and marine environments. Surrounding the plant, the landscape includes some pockets of rich biodiversity, comprising both coastal and chaparral ecosystems. The nearby marine environment supports a diverse population of marine species, making it ecologically significant.
- **Climate:** The region has a Mediterranean climate, with mild, wet winters and warm, dry summers, which influences the local flora and fauna.

1.2.2 *Precolonial Human Settlement*

Before European contact, the central coast of California, including the Diablo Canyon area, was inhabited by Indigenous peoples.

- **Indigenous Tribes:** The Chumash and Salinan tribes were the primary Indigenous groups in the area. The Chumash utilized the coastal environment for fishing, gathering, and trade, while the Salinan engaged in hunting and foraging in the inland areas.
- **Cultural Practices:** The Native Americans developed a rich cultural and spiritual relationship with their environment, crafting tools and creating art from local materials. They engaged in trade with neighboring tribes and utilized the Pacific

Ocean's resources for sustenance, along with acorns and other local plants for their diet.

- **Settlement Patterns:** Villages were typically situated near waterways or coastlines, facilitating access to food sources and trade routes.

1.2.3 Human Settlement Since Spanish Occupation

The arrival of European settlers dramatically transformed the landscape and the lives of Indigenous peoples in the Diablo Canyon region.

- **Spanish Colonization (1770s):** Spanish explorers and missionaries arrived in the late 18th century, claiming land and establishing missions. The Santa Barbara Mission, founded in 1786, served as a base for further exploration and settlement in the coastal regions.
- **Land Grants and Development:** Following the Spanish colonial period, the Mexican land grant system further altered land ownership patterns. Ranching and agriculture became prevalent as European settlers moved into the area, diminishing the Indigenous population through disease and displacement.
- **20th Century Developments:** With the growth of the agricultural economy and the rise of the nuclear power industry, the Diablo Canyon Nuclear Power Plant was established in the 1970s. Its construction brought debates about environmental impact and energy needs in California. The area remains a subject of discussion regarding the state's continually growing energy needs and environmental sustainability.

1.3 Overview of DCPD and its operations

Of the five nuclear power plants that have operated in California over the past century, DCPD is the only one that remains active. It occupies just under 1,000 acres of a property owned by Pacific Gas and Electric Company situated near Avila Beach in San Luis Obispo County (

Figure 1).

Figure 1: Location of Diablo Canyon Power Plant



Map Source: Google Earth

The PG&E operated plant contains two 4-loop pressurized water nuclear reactors with steam generators housed in steel-reinforced concrete containment (.

In 2016 it was announced that the plant would be decommissioned by August 2025. While DCPD generates carbon-free energy, nuclear power is not renewable and the expectation at the time was that the lost production capacity could be effectively replaced by low-carbon renewable energies.

Figure 1.2). The two units first went online in May of 1985 and March of 1986 with net capacities of 1,122 MW and 1,118 MW, respectively, giving the plant a total generation capacity of more than 2,200 megawatts. DCPD produces approximately 18,000 gigawatt hours (GWh) of electricity annually without emitting greenhouse gases, which is enough to provide carbon-free energy to more than 4 million Californians.

In 2016 it was announced that the plant would be decommissioned by August 2025. While DCPD generates carbon-free energy, nuclear power is not renewable and the expectation at the time was that the lost production capacity could be effectively replaced by low-carbon renewable energies.

Figure 1.2: Diablo Canyon Power Plant in 2022



Photo Source: The Tribune News

However, in subsequent years the state's energy shortages and issues with rolling blackouts during peak demand periods caused policymakers to revisit this decision. Ultimately it was determined that the plant's contribution to easing grid strain during peak load periods and help in meeting the state's clean energy goals in a cost-effective manner warranted an extension which resulted in the state passage of SB 846 in 2022² authorizing up to five additional years of operation under specified conditions. Following the conditional extension of its operating license, Unit 1 is currently licensed to operate through October 31, 2029 while Unit 2 is licensed to operate through October 31, 2030. Additionally, an extension operating license renewal application was submitted³ in November 2023 to the Nuclear Regulatory Commission (NRC) and is currently under consideration. If approved, the extension would extend the reactors' operating license for an additional 20 years beyond its current expiration date.

Past barriers to extension have included concerns about earthquake safety most notably arising following the 2011 earthquake in Japan which created a tsunami that caused extensive damage to the Fukushima Nuclear Power Plant. As a result, PG&E voluntarily suspended its license renewal application at the time that was underway in 2011 while it completed technical studies on risk to operations from seismic activity in the region. Moreover, SB 846 instituted requirements that additional seismic assessment be conducted moving forward. This resulted in a 2023 study which, relying on an updated seismic hazard model developed in 2015, concluded that total damage risks remained below the maximum risk criteria set by the US Nuclear Regulatory Commission (NRC).⁴

² <https://www2.arb.ca.gov/2022-senate-bill-846-dodd-bill-diablo-canyon-powerplant-extension-operations-chaptered>

³ <https://www.nrc.gov/reactors/operating/licensing/renewal/applications/diablo-canyon>

⁴ <https://www.pge.com/assets/pge/docs/about/pge-systems/seismic-assessment.pdf>

Meanwhile, Diablo Canyon Power Plant has been recognized for its safety record, continually receiving the highest nuclear power generation performance safety rating category from the NRC.⁵

1.4 Diablo Canyon Power Plant Generation

DCPP is California’s largest source of clean energy. The plant itself includes two reactors which have a generation capacity exceeding 2,200 megawatts and produce about 18,000 gigawatt hours (GWh) of electricity annually, which is enough to meet demands of more than 4 million Californians.⁶ In 2024 DCPP generated 18,379 GWh of power accounting for 8.5 percent of California’s in-state generation capacity, a slight increase over recent years (**Error! Reference source not found..1**). By producing carbon-free electricity this generation served to offset 6-7 million tons of GHS that would be generated if this electricity was instead generated via conventional resources.⁷ These avoided emissions are substantial and are equivalent to the exhaust of 1.6 million cars. Moving forward, DCPP is expected to help contribute to California’s clean energy goals.

Table 1.1: Diablo Canyon Power Plant Generation by Year

	2020	2021	2022	2023	2024	Average
Generation (GWh)	16,280	16,477	17,627	17,714	18,379	17,295
% in-state capacity	8.43	8.35	8.67	8.18	8.50	8.43

Source: CEC Energy Almanac

In addition to being the largest California provider of clean energy, DCPP is a relatively cheaper generation option than most clean energy alternatives, an important feature in an economy and a state where cost of living concerns are constantly at the forefront of policy discussions. Over the period 2020-2024, DCPP’s generation totaled 86,427 GWh with a \$5,558 million ratepayer revenue requirement / recovery.⁸ This implies a generation-weighted net implied cost of \$64.31/MWh. Above constellation plant costs and the recent average CAISO-wide price of \$40/MWh, this remains well below the the Renewable Portfolio Standard (RPS) average expenditure requirements of approximately

⁵ <https://seuc.senate.ca.gov/system/files/2025-08/08-19-2025-pge-testimony.pdf>

⁶ <https://seuc.senate.ca.gov/system/files/2025-08/08-19-2025-pge-testimony.pdf>

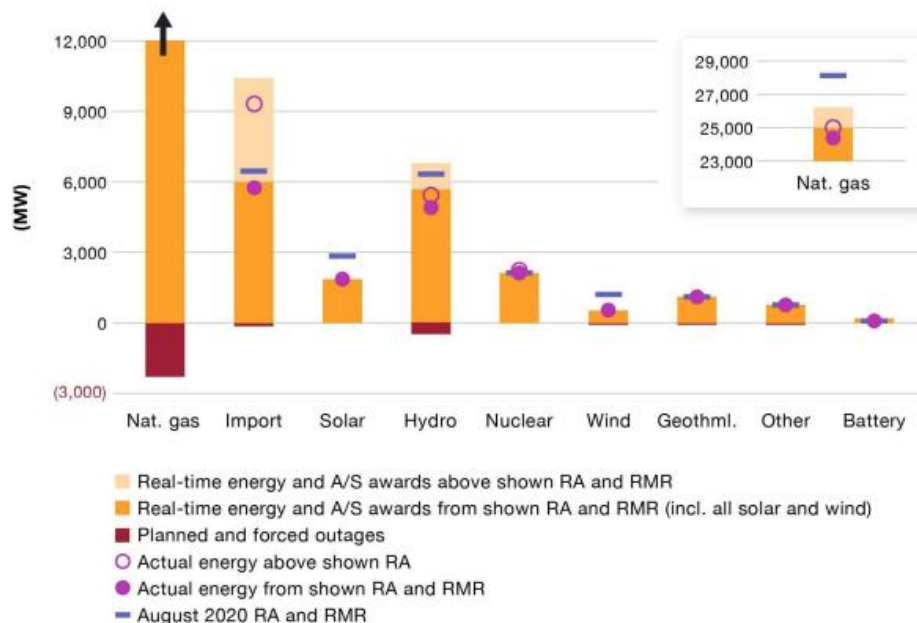
⁷ <https://www.pge.com/en/about/pge-systems/nuclear-power.html>

⁸ <https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A2503015/8314/572574800.pdf>

\$100/MWh.⁹ In other words, with lower costs of clean energy generation DCPD can play a role in helping California meet its clean energy demands in a cost-effective manner.

Another of the motivations for extending the DCPD's operation timeline is that the state has faced issues with blackouts during peak periods such as heatwaves and nuclear energy is more robust to heatwaves than many other generation sources. For example, during the 2020 heatwave which caused major disruptions to the California energy system, only Nuclear and Geothermal power contributed more than 1 GWh of energy at normal capacity and without disruption (Figure 1.3). Meanwhile, planned and forced outages were substantial for several other generation sources including natural gas, which is responsible for more than a third of California's power. This highlights a key benefit of nuclear generation in that it is robust to extreme weather conditions, an important feature given increasing heatwaves in California where energy demand is high and exposed populations require reliable energy to help protect themselves.

Figure 1.3: Performance of California Energy Resources During 2020 Heatwave



Source: Aborn et al 2021

In addition to providing a reliable baseload power, another benefit of nuclear power that has been highlighted in California is that high volumes of energy can be generated from small spaces. For example, a recent study¹⁰ assessed the land areas needed to replace DCPD generation using other clean energy sources. The study finds that alternative clean energy sources would require substantially more land area to meet DCPD generation

⁹ <https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/documents/energy/rps/2025/2025-padilla-report.pdf>

¹⁰ <https://energy.stanford.edu/news/extending-diablo-canyon-nuclear-plant-would-help-california-meet-its-climate-goals-new-study>

volumes. For example, the footprint of a solar project producing the equivalent amount of energy as DCPD would utilize approximately 90,000 acres whereas DCPD uses less than 1,000 acres (Figure 1.4). This contrast highlights the efficiency with which DCPD generates significant amounts of clean energy over a relatively small area, an important feature in a state with many competing land uses.

Figure 1.4: Land Area Needed to Produce DCPD Capacity with Solar Energy



Source: Aborn et al 2021

1.5 National and State Electricity Generation

California has a distinct energy mix from the United States overall (

Table 1.2). Whereas coal-powered plants generate 15% of the US's electricity, California's focus on clean energy mean that coal-power only accounts for 2% of electricity consumed in California. California gets more than 60% of its energy needs from clean sources (hydropower, wind, solar, geothermal, nuclear) compared to a little over 40% nationwide. Renewable energy (hydropower, wind, solar) is also more widely utilized in California accounting for 45% of statewide energy compared to less than 25% of overall generation nationwide.

Table 1.2: Electricity Generation Sources in California and the US Overall

Source	United States	California
Natural gas	41%	34%
Coal	15%	2%
Nuclear	19%	10%
Hydropower	6%	13%
Wind	10%	12%
Solar	7%	21%
Geothermal	<1%	5%
Biomass	1%	2%
Oil/Other	<1%	<1%
Unspecified	N/A	2%

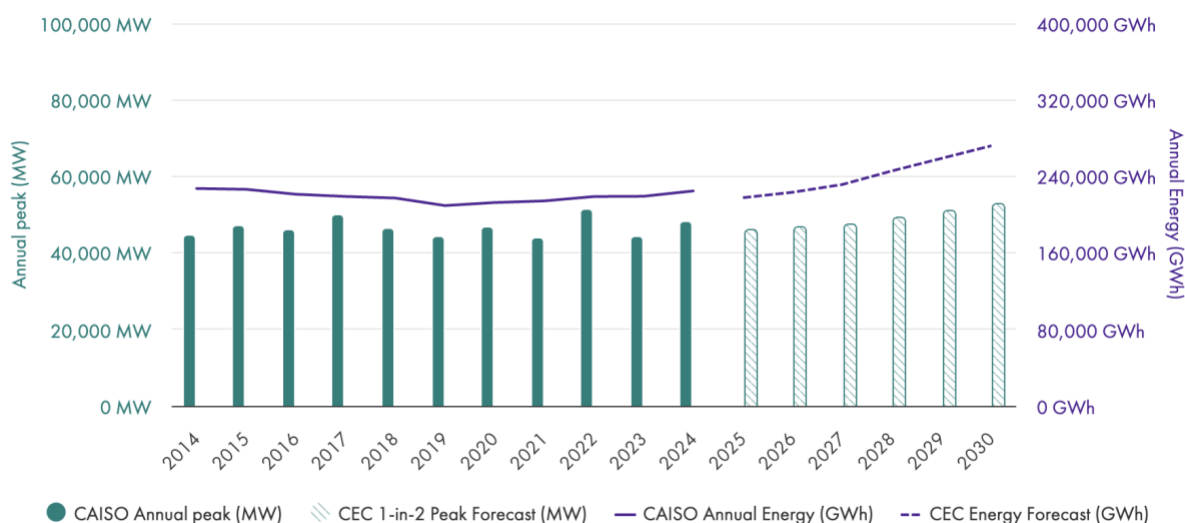
Source: California – CEC; US – EIA.

To meet its energy needs, California relies on a mix of in-state generation and energy imports. In 2024, California sources produced more than 275,000 gigawatt-hours accounting for 75% of the electricity used in the state. The state's remaining energy needs were met by importing energy from the Southwest (18% of the state's energy demands) or Northwest (7%).¹¹

¹¹ <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2023-total-system-electric-generation>

1.6 Emergent Trends in Electricity Demand

Figure 1.5: CAISO historical and projected annual peak load and energy



Source: 2024 CEC California Energy Demand Annual Consumption and Sales Forecasts

Looking to the future, in 2024 the California Energy Commission (CEC) projected that, despite energy efficiency improvements, California would see annual increases in the demand for electricity of 2.7% per year through 2030 and of 1.6% per year after 2030.¹² More recent evidence suggest that these estimates may be far too conservative. Growth in two of the most intensive areas of electric power use, data centers and cryptocurrency production, continues to accelerate across the United States. Recent LBL projects indicate that electric power demand by 2035 could be 40% higher, the largest decadal increase in US history (Figure 1.6). California could follow the same trend, but because it is over-represented in the IT sector it would be more realistic to assume in-state demand will grow even faster than the national average. In that case, California will face an unprecedented challenge to accelerate electric power production. Even if it only wants to maintain its current level of import dependence, keeping pace with this kind of demand growth could require doubling electric power capacity by 2040, far exceeding current expectations and investment planning.

¹² 2024 CEC California Energy Demand Annual Consumption and Sales Forecasts

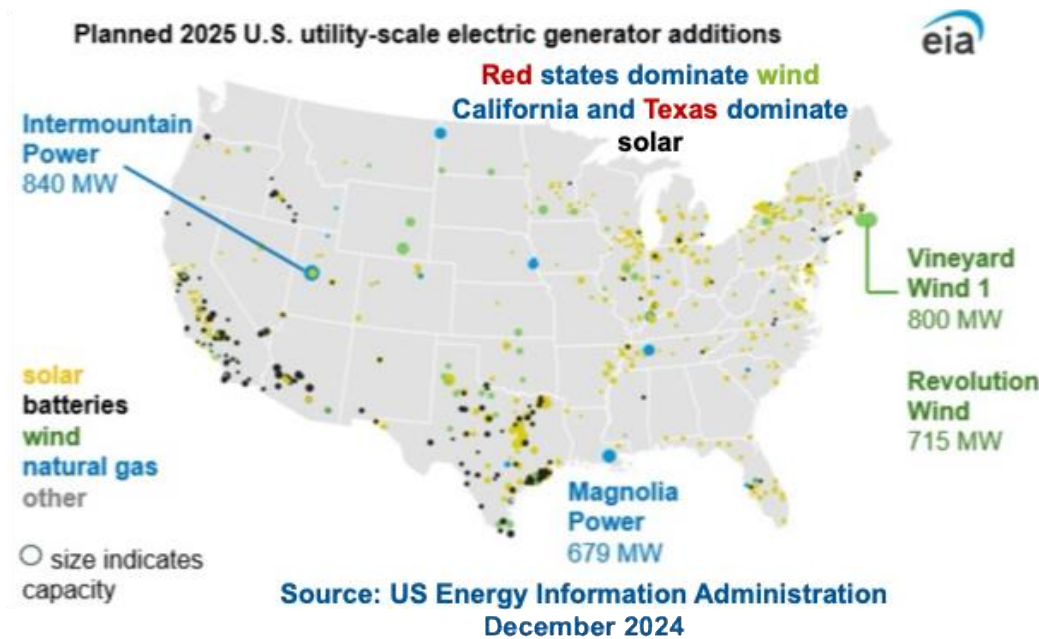
Figure 1.6: US Lower-48 Net On-grid Electricity Demand



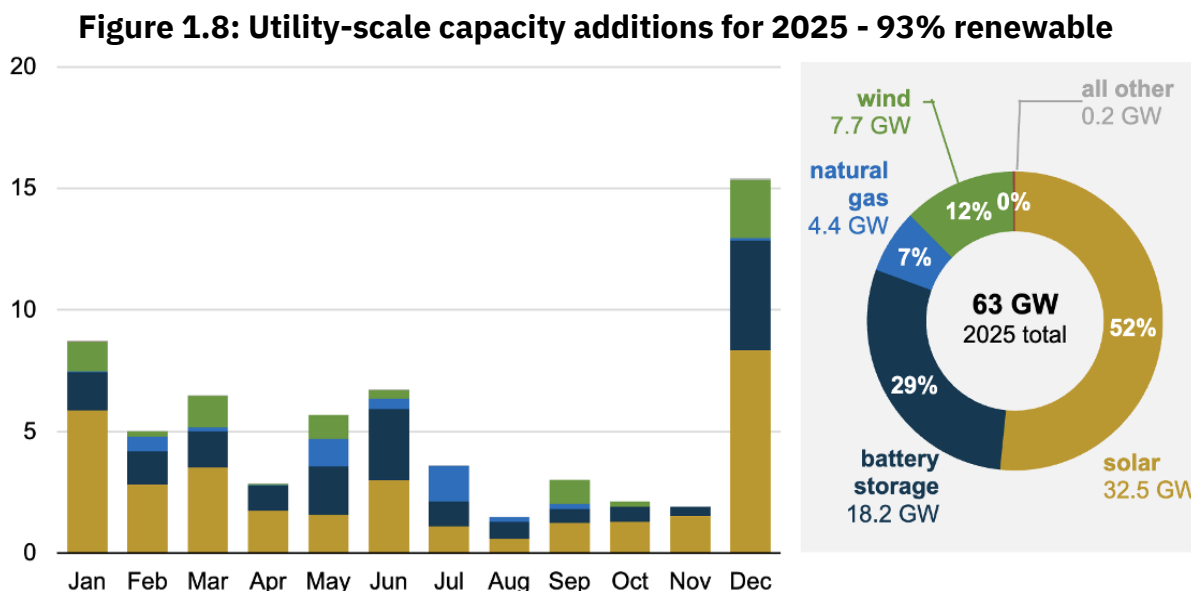
Source: LBNL: 2022

Meanwhile, information services are a primary driver of accelerated electricity demand, and the landscape of these investments is extensive and inclusive.

Figure 1.7: US Data Center Capacity Growth



Nationally, Federal approvals of large-scale generation capacity are currently dominated by renewables (Figure 1.8), apparently in recognition of significant improvements in cost and approval time relative to conventional generation technologies.



Data source: U.S. Energy Information Administration, *Preliminary Monthly Electric Generator Inventory*, December 2024

To meet rising demand, California has been proactive on renewable generation. Because of its well-known and determined commitment to decarbonize electric power, the state nearly doubled renewable production over the 15-year period 2008-2023 (Figure 1.9). To avoid increased import dependence this great achievement will have to be replicated, and amplified to produce clean energy that covers the rest of the 40% demand increase without recourse to higher exports or new in-state fossil fueled electric power generation.

Figure 1.9: Renewable Electric Power Production, California

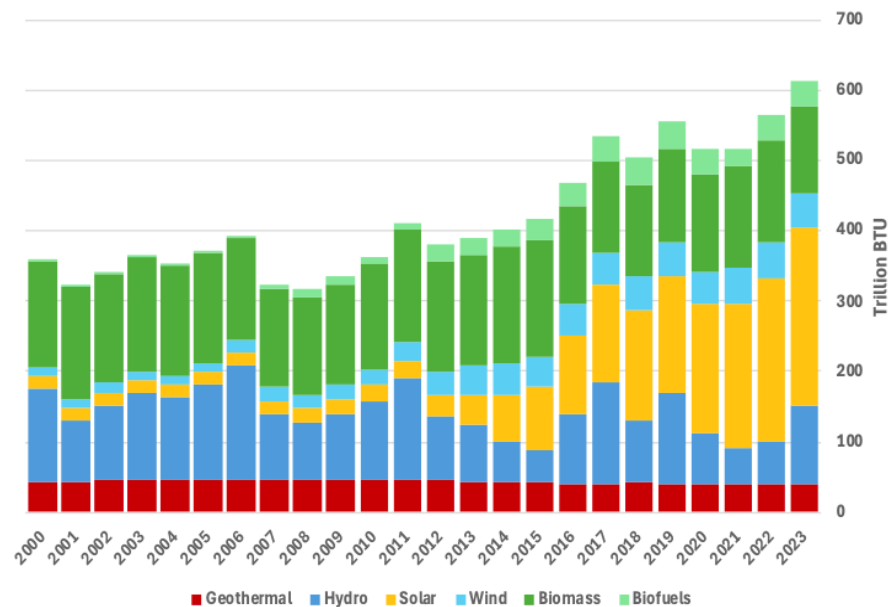
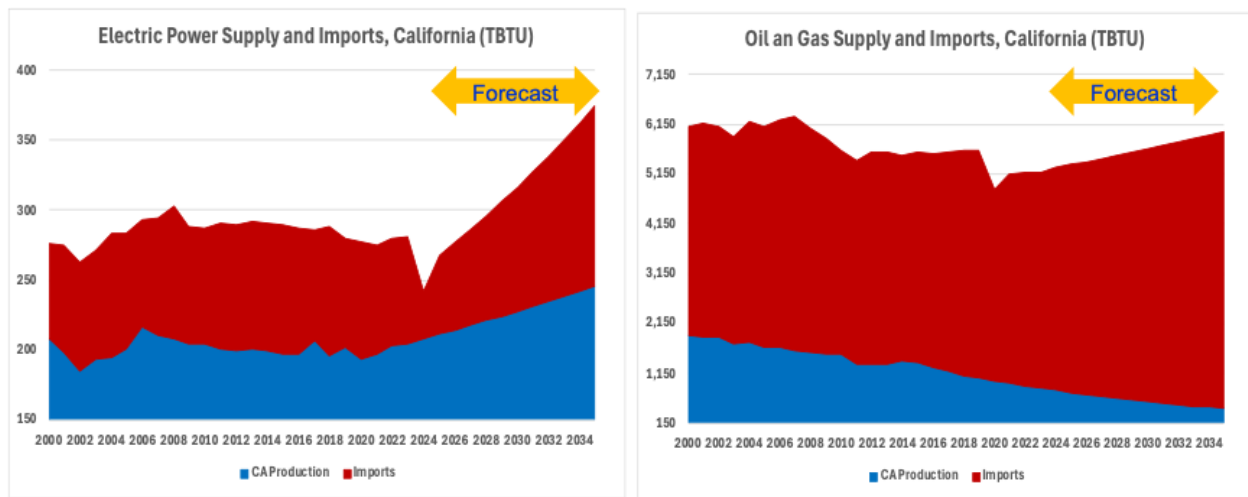


Figure 1.10: California's Energy Supply, In-state and Imported, by Type



The stakes in the energy supply race are high and likely to escalate, as are attendant climate and economic risks. Starting this new energy era, California is already the country's largest state energy importer (Figure 1.10). Indeed, if it were a country, California would be the world's sixth-largest energy importer after Germany.

These dramatic increases in electric power demand will only increase reliance on DCP as a foundational source of clean, local energy with consistent capacity to backstop intermittent renewables and moderate upward pressure on rates. One of the key drivers of this increase in demand is meeting the energy requirements of an increasing number

of datacenters statewide. As an example of this, the California Independent System Operator (ISO), which is responsible for about 80% of California's electricity demand and is a key purchaser of DCPD energy, is now planning for an increase in both annual energy requirements and annual peak energy demand with 10% higher peak demands and 20% higher annual energy demands forecast in 2030 relative to 2024.¹³

In order to reliably meet these increased energy needs and clean energy goals in a cost-effective manner, California will need to rely on a diversified mix of clean energy sources of which nuclear energy can play an important role.

¹³ CAISO 2025 Summer Loads and Resource Assessment Overview

2 An overview of DCPD operations

The primary driver of DCPD's economic impact is its operating expenditure on human resources, nonlabor inputs, contracted goods and services, and generation processes. This section summarizes the main operating cost components in preparation for estimating economic impacts in Section 3.

2.1 Employment and Workforce

DCPD is the largest private employer in San Luis Obispo County and provides a range of high paying jobs to residents in San Luis Obispo County, Santa Barbara County, and around the nation. Historically, the only larger employers in the area have been the public agencies San Luis Obispo County, California Polytechnic State University, Atascadero State Hospital, and the California Men's Colony.

2.1.1 Active workforce

Size: In total, DCPD employs more than 1,300 workers with an additional 1,100 required during planned refueling outages.¹⁴

Workforce Composition: The DCPD workforce consists of active personnel, which includes both permanent and temporary staff, as well as a large body of retired personnel with specialized skills. The transition from a planned shutdown to extended operations created challenges related to workforce retention and training.

During refueling outages: Approximately every 18 months, the plant hires an additional 1,100 temporary workers for each reactor, for up to 2,200 total, creating a boost to the local economy.

Shift from decommissioning to extension: Following the 2022 legislation (SB 846) to extend operations, PG&E had to pivot its staffing strategy from decommissioning to retaining and hiring workers. This included hiring hundreds of new employees to replace those who had retired or moved on, expecting the plant to close.

Specialized skills: The workforce is highly specialized and includes:

- Engineers
- Nuclear reactor operators
- Plant security personnel
- Mechanical and electrical tradespeople

¹⁴ <https://seuc.senate.ca.gov/system/files/2025-08/08-19-2025-pge-testimony.pdf>

Union representation: Employees are represented by various unions, including the International Brotherhood of Electrical Workers (IBEW) and the International Association of Machinists.

2.1.2 Inactive and retired workforce

Pre-extension retirement wave: Before the state decided to extend the plant's life, a significant number of experienced employees were eligible for retirement. In 2018, decommissioning documents indicated that 60% of the workforce was eligible for retirement before the original 2024 closure date.

Retention programs: To mitigate the "brain drain" of experienced personnel, PG&E and the state implemented employee retention programs. A 2018 agreement included a 25% retention bonus for workers who stayed until the planned 2025 shutdown.

Transition planning: The planned shutdown enabled unions to negotiate a "just transition" for workers, including retraining programs for those who wished to stay for the decommissioning phase, which would have kept the work with existing employees rather than outside contractors.

Knowledge transfer: The retirement wave created a significant challenge for knowledge transfer from more experienced workers to newly hired or younger employees. PG&E expressed concern that high attrition rates would negatively impact plant operations.

2.1.3 Workforce Retention Programs

In part to address "brain drain" risks associated with operation uncertainties five years ago SB 846 called for PG&E to institute a retention program to ensure safe operation of the plant by skilled, qualified employees.

Adam Peck, site vice president for staffing and continued operations at the nuclear generating station, told the Diablo Canyon Independent Safety Committee at its September public meeting that the retention program has been successful.

The period of 2016-2020 had a 98-percent participation level and the 2021-2023 period had a 95-percent participation level, Peck said. The retention program, which gives employees a 25-percent bonus at the end of the retention period, is partially responsible for the successful hiring of more than 300 new employees over the past year, he said.

The retention of qualified, skilled workers with nuclear experience is key for the plant's "knowledge transfer" program, according to Allen Wilson, senior director of engineering,

projects and outages for PG&E. "The knowledge transfer and proficiency committee is used to identify engineering needs and develop and monitor the knowledge transfer plans as they are identified."

"Managers are using two levels of engagement to manage proficiency. Employee engagement—which includes such things as pre-job briefings, peer-to-peer coaching, training and qualification, and mentoring—is one level. The other level is leadership engagement, which includes field and training observations and excellence in standards," Wilson said. An added benefit of the program is that it gives managers a "firsthand view of what's going on at the plant" where they can see obstacles a team might be encountering. "It also provides coaching and mentoring opportunities."

Subject-matter experts are paired with employees who have less experience in certain areas to help them move from novice level to one of experience and eventually expertise in that field, Wilson said.

Time for knowledge transfer is allotted in daily work schedules, he said.

Employees who do not come from a nuclear background or have not graduated from a university where nuclear safety culture is embedded are "from Day 1 . . . indoctrinated in the nuclear safety culture," Wilson said.

2.1.4 Future workforce

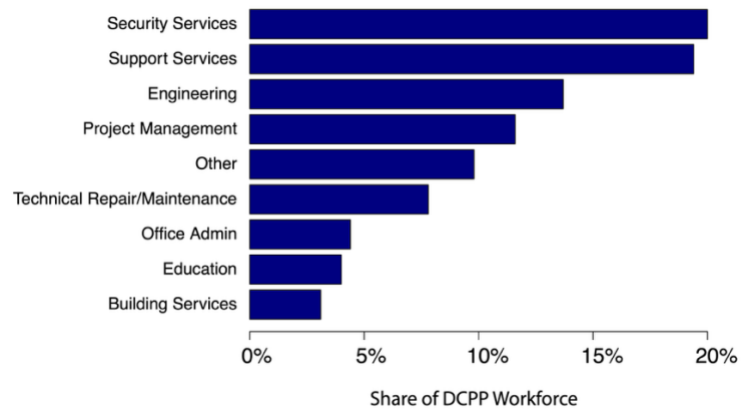
Continued hiring: As part of its preparation for extended operations, PG&E has continued hiring and training new employees.

Union priorities: The workforce extension and retention programs remain a priority for unions, which played a major role in the negotiations leading to the plant's continued operation. The focus is now on ensuring a skilled workforce is maintained to operate the plant safely through its new end-of-life dates of 2029 (Unit 1) and 2030 (Unit 2).

2.1.5 Job Classification and Geographic Distribution

Employees of DCPD work under a range of classifications and occupations with 20% each devoted to classifications related to security services and support services, respectively, 14% involved in engineering, and 12% in project management (Figure 2.1). Other major job categorizations include technical repair and maintenance (8%), office administration (4%), education (4%), and building services (3%).

Figure 2.1: Job Classification of DCPD Employees, 2023



Source: DCPD 2013

These job classifications cover a wide range of occupations (Table 2.1) with large shares of workers in technical occupations such as nuclear power reactor operators (12%), nuclear technicians (11%), nuclear engineers (8%), and electrical engineers (5%)

Table 2.3: Share of Jobs by Occupation

Occupation Description	SOC Code	% Jobs
Nuclear power reactor operators	51-8011	11.8
Security guards	33-9032	11.3
Nuclear technicians	19-4051	9.5
Nuclear engineers	17-2161	8.3
First-line supervisors of production and operating workers	51-1011	4.9
Electrical & electronics repairers, powerhouse, substation, relay	49-2095	4.7
Electrical engineers	17-2071	4.6
Business operations specialists, all other	13-1199	3.2
Industrial machinery mechanics	49-9041	3.1
First-line supervisors of mechanics, installers, and repairers	49-1011	2.7
Training and development specialists	13-1151	2.4
General and operations managers	11-1021	2.2
Project management specialists	13-1082	2
Architectural and engineering managers	11-0041	1.9
Electricians	47-2111	1.8
Managers, all other	11-0099	1.2
Industrial production managers	11-0051	1.1

Source: Estimates derived from national BLS Industry-Occupation Matrix for Nuclear Electric Power Generation

Local employees of DCPD primarily reside in San Luis Obispo and northern Santa Barbara Counties (Figure 2.6; Table 2.4) illustrating their broad influence on local economies across the region. Each of Arroyo Grande, San Luis Obispo, and Atascadero have at least 160 DCPD employees residing. As such, the influence of DCPD employees is substantial. For example, in Atascadero more than 1% of the total workforce is employed by DCPD. In addition to the local communities shown, DCPD also employs approximately 60 employees in other California counties and 4 employees in other states. In 2023, total annual payroll across all employees residing in either San Luis Obispo and Santa Barbara Counties reached nearly \$180M.

Figure 2.6: Residential location of local DCPD Employees

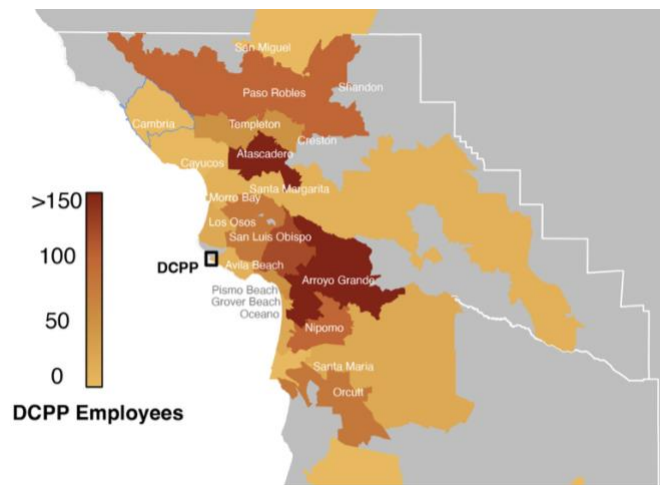


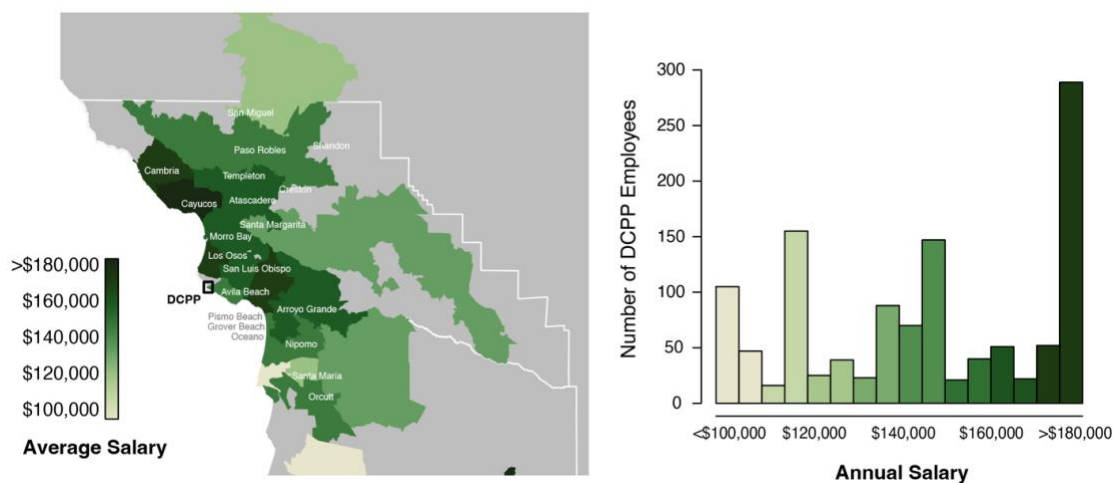
Table 2.4: Payroll by Employee City of Residence 2023

City of Residence	Number of Employees	Average Annual Salary	Total Annual Payroll
Arroyo Grande	186	\$153,004	\$28,458,812
Atascadero	164	\$151,650	\$24,870,578
Avila Beach	10	\$146,237	\$1,462,373
Cambria	2	\$160,427	\$320,854
Cayucos	2	\$181,704	\$363,407
Grover Beach	65	\$143,905	\$9,353,830
Los Osos	29	\$166,363	\$4,824,519
Morro Bay	18	\$157,536	\$2,835,649
Nipomo	106	\$147,770	\$15,663,569
Oceano	28	\$145,265	\$4,067,422
Paso Robles	108	\$142,356	\$15,374,485
Pismo Beach	46	\$168,244	\$7,739,236
San Luis Obispo	210	\$159,454	\$33,485,324
San Miguel	4	\$125,246	\$500,982
Santa Margarita	11	\$137,722	\$1,514,937
Shell Beach	7	\$168,569	\$1,179,980
Templeton	53	\$156,212	\$8,279,219
Cities in Santa Barbara County	141	\$137,659	\$19,409,871
Cities in Other Counties - California	63	\$154,976	\$9,763,514
Out of State	4	\$167,487	\$669,948
All Locations	1,257	\$153,589	\$190,138,509

The combination of DCPD employing many highly skilled technical jobs in addition to workforce representation from a variety of labor unions among non-technical occupations

(including IBEW, SEIU, and ESC) means that DCPD's workforce tends to make higher than average salaries (Table 2.4.2; Figure 2.7). The median annual household income for local DCPD employees is approximately \$147,000, more than 50% higher than the San Luis Obispo countywide median household income.¹⁵ Annual salaries among local DCPD employees are shown in Figure 2.7 by residence zipcode (left panel) and across all DCPD employees residing in either San Luis Obispo and Santa Barbara Counties (right panel).

Figure 2.7: Annual Salary by Residential Location Among Local DCPD Employees 2023



Source: PG&E. Left panel shows average DCPD employee salaries by residential zipcode right panel shows distribution of annual salaries across DCPD employees residing in San Luis Obispo or Santa Barbara Counties.

In addition to higher salaries, DCPD employees tend to receive better than average benefits including healthcare, pensions, and retirement plans. By maintaining a stable well compensated year-round workforce that is relatively insulated from state budget issues and broader economic changes, DCPD acts as a stabilizing force in the local economy helping offset volatility from factors such as fluctuating agricultural prices, recession-driven dips in tourism, and swings in government payrolls that have strained regional economic stability in recent years.

Aside from the contributions of current employees and their salaries, additional benefits arise from having PG&E as a major employer in the area. For example, PG&E and its employees provide hundreds of thousands of dollars in grants and donations to local non-

¹⁵ 2023 1-year ACS SLO median income is approximately \$91,000

profits every year as well as volunteered time. In addition, many retired DCPD employers remain in the area and their PG&E pensions tend to give them disposable income which can in turn induce additional spending and help bolster the local economy.

Collectively, these factors have sustained a major role for DCPD in the economy in San Luis Obispo County and surrounding areas.

2.2 Expenditures on Goods and Services

Another way that DCPD bolsters the economy is through direct expenditures. DCPD is a major purchaser of goods and services from local, state and national sources, averaging over \$285 million in expenditures per year nationally over the past 10 years. Purchases include procurement of parts, tools and services from a wide variety of businesses. Expenditures vary from year to year as shown in Table 2.3 along with the 5-year averages. The average obscures strong trends in declining expenditure from 2015-2022 which have since been reversed with 2023 and 2024 expenditures the highest they have been in the 10 years. This pattern reflects the planned decommissioning of the plant followed by the reversal of this decision.

Direct expenditures in San Luis Obispo County in 2024 totaled more than \$20 million highlighting the important role DCPD plays in the local economy. When specialty parts or expertise are unavailable locally, DCPD goes out of area to purchase goods and services first prioritizing sourcing from other parts of California (\$44M in 2024) before turning to outside vendors when in-state procurement is not feasible (\$234M in 2024).

Table 2.3: DCPD Expenditures by Study Area

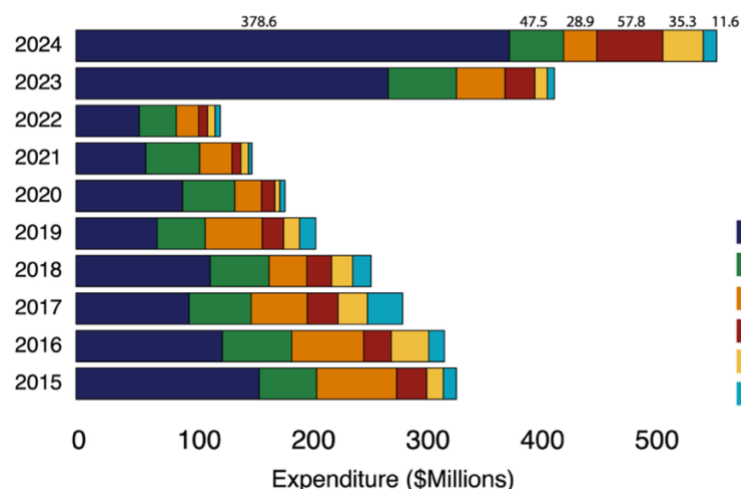
	2020	2021	2022	2023	2024	Average
San Luis Obispo County	\$5,134,451	\$6,347,886	\$7,210,273	\$9,947,529	\$20,274,798	\$9,782,988
California (Other Counties)	\$34,278,738	\$35,879,396	\$18,130,385	\$54,542,777	\$76,925,382	\$43,951,335
Nationwide (Other States)	\$143,240,469	\$111,477,946	\$100,724,807	\$353,457,430	\$462,539,026	\$234,287,936

Source: PG&E

Combined across expenditure locations, the largest category of direct spending most years is professional services (\$379M in 2024) following by manufacturing materials (\$58M), utilities (\$48M), and waste management (\$35M) (

Figure). While the value of expenditures vary by year, 2023 and 2024 expenditures have recovered from the recent decline and exceeded expenditures in each year since 2015.

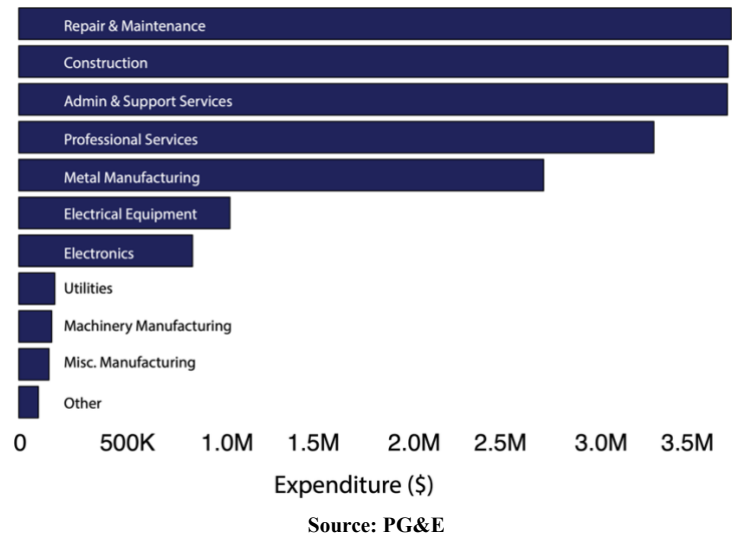
Figure 2.3: Total DCCP Expenditures by Category and Year



Source: PG&E

In San Luis Obispo County, the \$20M of 2024 direct expenditures included more than \$2M each spent in the categories of repair & maintenance, construction, admin & support services, professional services, and metal manufacturing, respectively Figure 2.4. In addition, more than \$900,000 was spent each on equipment and utilities. The total 2024 expenditure is a substantial increase over recent years and is higher than in any year since 2015 mirroring DCCP's direct increase in expenditures across the rest of the state. These expenditures represent a direct transfer from PG&E to local businesses.

Figure 2.4: 2024 Expenditures in San Luis Obispo County by Category



2.3 Operational Costs

After labor and capital investment, the Diablo Canyon Power Plant's operating costs are dominated by an input supply chain that can be summarized by its key components: uranium fuel procurement, ocean water for its once-through cooling system, and a network of specialized vendors for maintenance and hardware.

2.3.1 Uranium fuel supply

Fuel source: Diablo Canyon uses uranium fuel, which is sourced from the global market. The fuel is prepared and fabricated into fuel assemblies for use in the reactor.

Refueling cycle: A portion of the reactor's fuel assemblies is replaced with new ones during scheduled refueling outages, which occur approximately every 18 to 20 months. The plant's uranium usage is approximately 47.20 metric tons per year.

Increased fuel costs: Pacific Gas and Electric (PG&E) has noted that the cost of uranium fuel has increased significantly in recent years.

2.3.2 Ocean water cooling system

System type: The plant uses a "once-through cooling system" that draws in a massive volume of cold ocean water to condense the steam that drives its turbines.

Water volume: The plant draws in an estimated 2.5 billion gallons of seawater per day from the Pacific Ocean.

Closed loops: The seawater does not come into contact with the nuclear reactor. Instead, it cools a separate loop of water, which cools the steam in the plant's secondary loop.

Environmental impact: There have long been concerns about the environmental impact of this system, particularly the effect of warmer water being discharged back into the ocean and the killing of marine life drawn into the intake.

2.3.3 Maintenance and hardware

- **Contractors:** PG&E relies on a network of qualified contractors for maintenance, engineering services, and other site support.
- **Examples:** Fluor Corporation previously held a five-year contract to serve as an integrated services supplier for operations and maintenance at Diablo Canyon.
- **Outage support:** During scheduled refueling and maintenance outages, PG&E brings in additional contract workers to assist with replacing fuel, conducting maintenance, and testing systems and components.
- **Holtec International:** For the storage of spent nuclear fuel, Diablo Canyon uses the Holtec HI-STORM 100 cask system. Holtec was also responsible for manufacturing and delivering the specialized canisters.
- **Specialized equipment:** The aging nature of the plant requires specialized vendors for major maintenance and capital upgrades.

2.3.4 Technology

- Advanced software applications in all aspects of operations

Beyond uranium fuel, ocean water for cooling, and specialized hardware, Diablo Canyon's ongoing operations primarily rely on critical software technology, with a major focus on artificial intelligence (AI) to improve efficiency and manage vast amounts of critical data. This technology is key to maintaining a safe, reliable, and more efficient plant, especially as it operates beyond its originally planned lifespan.

- Neutron Enterprise software

A major technology input for Diablo Canyon is the Neutron Enterprise solution from the AI startup Atomic Canyon.

Purpose: To help plant staff and operators quickly search, retrieve, and analyze massive amounts of technical documentation and regulatory information. PG&E has billions of pages of records, many of which are decades-old and were originally on formats like microfiche.

Methodology: The software uses the latest optical character recognition (OCR), retrieval-augmented generation (RAG), and AI-powered search technology to cut search times from hours to seconds.

- **Hardware and security:** The AI is run on-site using specialized NVIDIA hardware. The system is designed to have no cloud access for security purposes, ensuring that sensitive documents and information do not leave the facility.
- **Efficiency gains:** By automating data retrieval, the AI allows qualified workers to spend more time on problem-solving, decision-making, and high-value tasks, instead of searching for information.
- **Simulation and predictive maintenance**

Another critical technological input is the use of simulation and predictive software.

Operator training: Nuclear operators undergo extensive training in advanced control room simulators, which precisely mimic the plant's operational characteristics under a wide range of normal, abnormal, and emergency conditions. This allows for rigorous training and practice in a safe, controlled environment.

Predictive analytics: While still in its early stages of application at Diablo Canyon, AI is expected to eventually assist with more complex tasks, such as scheduling maintenance. This would involve using data analysis to predict equipment failures before they happen, allowing for more proactive and efficient maintenance scheduling.

- **Control and monitoring systems**

Diablo Canyon's operations rely on sophisticated control and monitoring systems, which are maintained under strict regulatory oversight from the Nuclear Regulatory Commission (NRC).

Control room: A centralized control room houses the consoles and displays that allow licensed operators to manage the entire plant, including the reactor, turbine, and cooling systems.

- Real-time data: These systems provide operators with real-time data on plant performance, temperature, pressure, radiation levels, and other key parameters.
- Data storage and security
- On-site storage: To comply with NRC and Department of Energy regulations, Diablo Canyon maintains robust on-site data storage policies for all sensitive information.
- Cybersecurity: As an operational nuclear facility, it maintains stringent cybersecurity protocols to protect its control systems and data from external threats.
- Artificial intelligence (AI): PG&E is implementing AI technology from a company called Atomic Canyon to assist staff with finding and organizing data from the extensive plant documentation.
- NVIDIA hardware: To support the AI, PG&E brought in specialized NVIDIA hardware to run the software on-site, a setup specifically designed to not have cloud access for security purposes.

The direct expenditures characterized in the previous section represent a fraction of total DCCP operational expenses which exceeded \$1.1B in 2024 and which have remained steady over the past 5 years. Table summarizes total operational expenses estimated from general rate cases (GRC). These expenses are used to address the costs of operating and maintaining the utility system and are approved by CPUC as part of the budgeting process.

Table 2.4: Annual DCCP Operating Expenses

2020	2021	2022	2023	2024
\$1,094,915,000	\$1,078,665,000	\$1,068,689,000	\$1,088,391,000	\$1,170,951,000

Source: CEC Energy Commission Staff Report-SB 846

Operational costs are comprised of a variety of factors with the breakdown shown below in Table 2.5. Major cost subcategories include work management accounting for more than a quarter of total costs while loss prevention, operations, and support services each account for about 20%.

Table 2.5: Operating Costs as Percentages of Total Expenses

Operational Subcategory	2020	2021	2022	2023	2024
Engineering	11.7	10.3	10.9	7.9	8.3
Fuel Management	0.1	0.2	0.2	0.5	0.1
Loss Prevention	19.7	18.9	19.0	12.7	11.4
Materials and Services	1.2	1.3	1.9	1.3	0.9
Operations	17.8	18.6	18.7	12.9	14.9
Support Services	20.0	21.1	26.5	26.7	28.4
Work Management	26.6	27.2	26.5	26.7	28.4
Training – Develop and Conduct	2.9	2.4	2.2	3.6	2.5

Source: CEC Energy Commission Staff Report-SB 846

2.4 Property Tax

Diablo Canyon Power Plant has been a major source of funding for schools and other government agencies in the region since its opening. In the 2010s DCPD paid approximately \$25 million per year in taxes to San Luis Obispo County covering a variety of local agencies including school districts and general funds. For example, a decade ago annual payments to the San Luis Obispo School District often exceeded \$10M per year. In recent years, following a value reassessment related to uncertainty of future plant activities, the property tax valuation has been lowered resulting in smaller annual payments including \$3.71 to the SLO school district in the 2024-25 fiscal year. To help offset the lowered revenue to local agencies, PG&E created a community mitigation fund worth \$85 million including a \$75 million essential services mitigation fund that was paid out between 2017 and 2025. As a result, PG&E has paid more than \$185 million to San Luis Obispo County since 2018 and remains a major source of county revenue.¹⁶ Whether future property tax payments continue similar to their current values or are reassessed to be in line with earlier assessments will depend on whether future permitting is approved and whether legislative changes are made to how tax valuations are implemented.

¹⁶ <https://seuc.senate.ca.gov/system/files/2025-08/08-19-2025-pge-testimony.pdf>

2.5 Operating Revenues

DCPP revenues come from electricity sales to various outlets and are regulated by CPUC. Most of DCP's electricity sales revenue come from sales into organized markets like California ISO (\$640M in 2024) and from retail sales to residential or commercial retail customers (\$659M in 2024). These sales come at different prices where sales into ISO or similar authorities are sold at wholesale prices and sales to residential or commercial consumers are sold at retail prices. Combined, sales to market and retail customers typically make up 85-90 percent of DCP's total electricity sale revenues. Remaining revenue comes from allowing spare capacity to be dispatched to meet load demands (Table). Given revenue levels, sales volume, and DCP's operational cost revenue requirements, DCP is expected to continue playing a key role in providing clean energy to wholesale, residential, and commercial markets in California.

While specific annual revenue for the Diablo Canyon Power Plant is not publicly disclosed, official reports project hundreds of millions of dollars in net financial benefits from its extended operation. The plant is not a for-profit enterprise selling power on the open market. Instead, the electricity it generates is used by its owner, Pacific Gas and Electric (PG&E), to serve its customers.

Key financial details include the following:

- **Projected net benefits:** In March 2025, PG&E forecast that the plant's extended operation through 2030 would result in a net benefit of \$3.2 billion for California energy customers, which is approximately \$540 million per year.
- **Customer revenue return:** A 2024 Sacramento Bee opinion piece¹⁷ stated that the market revenue from the plant's generated energy would be around \$6.1 billion, and that 100% of this amount would be returned to customers to offset operational costs.
- **Loan funding:** The state of California approved a loan to PG&E to keep the plant operating past its original closure date. The loan is intended to be repaid from future federal funding, with the cost for extended operations not meant to be covered by ratepayers.

¹⁷ <https://www.sacbee.com/opinion/op-ed/article291055345.html>

- **Decreasing tax revenue:** Local tax revenue from the plant has declined as plant value has depreciated. As of 2025, PG&E had fully depreciated the plant, substantially reducing its tax obligation to local agencies.

The \$6.1 billion in market revenue from the Diablo Canyon Power Plant is returned to customers by **offsetting the costs of the plant's extended operation**. This is not a direct rebate or lump-sum payment but rather a reduction in the overall costs that would otherwise fall on ratepayers. The mechanism for this return is managed through the California Public Utilities Commission (CPUC).

How the revenue return process works:

1. **Revenues are used to cover operating costs.** The electricity generated by Diablo Canyon is sold on the California energy market. The revenues from these wholesale sales are applied to cover the costs of extending the plant's operation, such as maintenance, staff, and fuel.
2. **Ratepayers fund remaining costs (and receive excess).** The CPUC determines the annual "revenue requirement" for the plant, which is the total cost to run it. When market revenues are less than this cost, customers—including those of PG&E, Southern California Edison, and San Diego Gas & Electric—cover the remaining amount through a non-bypassable charge on their electricity bills. In the event of excess market revenue, that money is used to lower these charges.
3. **Revenue offsets the need for more expensive energy.** In addition to market revenues, a significant part of the financial benefit is Diablo Canyon's contribution to grid reliability. Because the plant provides a reliable, carbon-free energy source, utilities do not need to buy as much expensive and often more polluting power from other sources to meet demand, which further reduces costs for customers.
4. **No direct shareholder benefit.** State law prohibits PG&E's shareholders from profiting from the revenue generated by the plant's extended operations. This ensures that all market revenue is returned to customers, either by covering operating costs or through reduced fees.
5. **Rebates for specific incidents.** In some cases, customers have received specific, targeted refunds. For example, after regulators found PG&E mismanaged a 2021 unplanned outage, the utility was ordered to repay \$43.2 million to customers for the cost of replacement power. This was returned through rate adjustments, with the amount varying by customer usage.

2.5.1 Net financial effect of electric power revenues on customers

The \$6.1 billion figure refers to the estimated total market revenue, but the actual benefit to customers is the **net benefit**—the difference between the market revenue and the plant's operating costs. PG&E projects that the plant's extension will provide a net financial benefit of \$3.2 billion to California customers, averaging about \$540 million per year. This benefit is realized through lower electricity costs than if the plant were shut down and replaced with more expensive energy sources.

2.5.2 Technical revenue terms defined

- **Non-bypassable charges on customer bills related to DCPP:** There are two main non-bypassable charges related to Diablo Canyon on California customer bills: the Volumetric Performance Fee and other charges that cover the plant's operational costs. These charges are defined by state law and CPUC decisions and apply to customers of PG&E, Southern California Edison, and San Diego Gas & Electric.
- **Volumetric Performance Fee (VPF)¹⁸:** This fee was set in state legislation (SB 846) to provide compensation to PG&E for operating the aging plant and is applied at a rate of \$13 per megawatt-hour generated by Diablo Canyon.
 - It is not managed by the CPUC's standard ratemaking process, but rather was established directly in the legislation that authorized the plant's extended operations.
 - The charge is shared among customers of PG&E, SCE, and SDG&E, based on the principle that the plant's electricity benefits the entire state grid.
 - For 2026, the fee is estimated to cost PG&E customers \$190.8 million, SCE customers \$59.7 million, and SDG&E customers \$12.9 million, resulting in an estimated monthly increase of a few dollars for average residential bills.
- **Diablo Canyon Extended Operations Balancing Account (DCEOBA):** This is a CPUC-approved mechanism that tracks the costs and revenues associated with extending the plant's operational life.

¹⁸ The VFP is an important but also quite complicated revenue category, explained in more detail in Appendix @ below.

- **Costs recovered:** The DCEOBA tracks expenses like operations, maintenance, fuel, and other capital improvements necessary for the plant's continued operation.
 - **Revenue offset:** Market revenues from the sale of Diablo Canyon's electricity are used to offset these costs, helping to reduce the burden on ratepayers.
 - **Balancing process:** Each year, PG&E files an application with the CPUC to true-up the DCEOBA. If costs exceeded revenues, customers are charged for the difference. If revenues exceeded costs, customers would receive a credit on their bills.
 - **Annual True-up:** In late 2024, the CPUC approved \$722.6 million in ratepayer costs to cover the plant's continued operation through 2025. This cost was partially offset by market revenues.
- **Nuclear Decommissioning Charge:** This is a long-standing non-bypassable charge that predates the extension of Diablo Canyon. It is used to fund the eventual decommissioning of the state's nuclear plants.
 - This charge was part of the original agreement to retire Diablo Canyon and continues to fund the process of safely storing spent nuclear fuel.
 - The non-bypassable nature of this charge ensures that even customers who generate their own power through solar or other means contribute to this ongoing obligation.

Table 2.6: Annual DCPD Revenues

[TBC]

Source: PG&E

3 General Economic Impact Assessment

3.1 Approach

The overall impact of DCPD extension the SLO economy was the primary concern for those interested in this assessment, and most of the project research was devoted to this component. To estimate the local economic and fiscal effects of DCPD operations, we utilized a regional input-output model called IMPLAN that estimates impacts through industry-specific changes in economic activity. The IMPLAN system offers the most

detailed data available on the structure of the local, regional, and state economy, and it effectively supported our efforts to identify and evaluate the many dimensions of economic linkages between DCPD and the local, state, and regional economy.

3.2 Methodology

The complexity of the modern economy is such that decision making relying on intuition or rules-of-thumb alone is unlikely to achieve anything close to optimality. To estimate the impact of continued DCPD operations we utilize a variety of empirical techniques described in this and the following two chapters of the report. Our primary analysis uses a regional input-output model that estimates economy-wide effects through industry-specific activities of investment, employment, purchasing of resources and inputs, production, and sales. Input-output models are a common tool for impact analysis and are distinctive in their ability to trace the complex interdependence of industries, workers, and consumers across a regional economy. Input-output models excel in their ability to reveal not only direct linkages, but indirect and induced effects as they are transmitted through the “multiplier” process linking economic activities and livelihoods through expenditure chains that span the economy.

Conceptually, multipliers measure how expenditures in a specific sector spread through other sectors in the economy through diminishing rounds of new spending. In the context of DCPD, the “direct” effect refers to any changes in economic activity that DCPD is directly responsible for generating such as the number of jobs on site or total expenditures generated by the plant. The “indirect” effect reflects the economic activity of industries that support the operation of DCPD. This includes any associated jobs that are retained by the plant but do not work directly for PG&E (e.g. catering, security, maintenance and repair, etc.). Finally, the “induced” effect refers to the changes in household expenditures that result from the initial change in economic activity from the originating sector. This includes the local services that DCPD employees purchase (e.g. cappuccinos and haircuts) as well as any associated increased spending from those employed indirectly. Furthermore, induced effects capture subsequent rounds of spending as they move through the economy. For example, when a DCPD employee purchases a cappuccino, the barista may purchase lunch from a vendor who buys produce from a local farm, and so forth.

To conduct our analysis we rely on the IMPLAN input-output modeling tool. IMPLAN is both a software and a collection of databases, and the detailed, proprietary data of IMPLAN makes it one of the more commonly used input-output models. IMPLAN provides information for 528 industries and 21 different economic variables, but more importantly provides the input-output structural matrices that detail the interrelationship between industries, and between industries and households. With direct economic impacts as an

input, IMPLAN calculates the indirect and induced impacts through the use of constructed multipliers. IMPLAN data is available at the national, state, county, and zip-code level, making it particularly useful for impact analysis on regional economies.

3.3 Data Requirements

With IMPLAN, or any economic model, the key to high-quality estimates are accurate inputs to the impact assessment model. Inputs to the assessment (events in IMPLAN nomenclature) can be thought of as exogenous changes in specific economic activities to the economy, specific events that generate impacts measurable by the model. Events represent any direct change to the baseline economy, such as changes in specific industries for categories such as revenue, expenditures, or employment. As one industry changes, IMPLAN provides estimates for economic changes in every other actor across the study area.

Rather than considering some external economic shock or a new investment project, the goal of this study is to identify the detailed benefits accruing to the economy from extending the existing operations of DCCP. This means will need to identify existing economic linkages to DCCP operations. For a facility of this scale and complexity, several pathways transmit economic benefits to the local, state, regional, and national economy. These include payrolls, benefits, and retention programs, nonlabor operating expenditures, revenues adducible to existing operations, and taxes, fees, and other payments to public institutions and NGOs. Major DCCP cost components are summarized in the following table and discussed in greater detail in following subsections.

Table 3.1: Summary of Labor and Nonlabor Operating Costs, Taxes, and Fees (annual average)

	SLO	SB	Other CA	Other USA	Total
Employment	1,031	142	1,056	13	2,242
Ave per Capita	\$152,885	\$137,569	\$142,251	\$163,460	\$146,968
Expenditures					
Payroll	\$157,624,171	\$19,534,858	\$150,217,154	\$2,124,985	\$329,501,168
Nonwage Benefits	\$63,049,668	\$7,813,943	\$60,086,861	\$849,994	\$131,800,467
Retirement Spending	\$46,028,534				
Retention Scheme	\$34,699,573	\$4,300,427			
Expenditures on Goods and Services	\$4,626,218	\$276,722	\$29,024,308	\$284,051,473	\$317,978,722
Taxes and Fees	\$15,100,000				
Total Costs	\$321,128,165	\$31,925,950	\$239,328,323	\$287,026,453	\$779,280,357

Source: BEAR estimates from DCCP and official data.

3.3.1 Payrolls

The largest DCPD operating cost category is salary and benefits for existing, contingent, and retired members of the facility's highly skilled technical workforce. These costs can be expected to continue and even grow over time with the cost of living, including salaries for existing regular and contingent workers, as well as benefits to current and former employees (estimated to average 40% over base wages and salaries). For 2023 (the year we are using for IMPLAN impact assessment), current local employment is about 1300 and payroll totals about \$330 million. Because most of these workers arrived in the area to work for PG&E, the effect of these payrolls is a pure stimulus to the local economy.

The payroll stimulus is transmitted through employee spending, tax payments, and saving/investment behavior. For example, the average household in California spends about 70% of income on local goods and services and about 70% of their consumption targets services. Thus about half the direct payroll impact will stimulate labor-intensive services in and around the SLO region, and the "multiplier" impacts of this spending can be credited with creating and sustaining many jobs beyond the boundaries of the DCPD facilities.

The second set of effects we must consider are other expenditures to cover nonlabor operating cost and input requirements. Annual average nonlabor expenditures the plant makes in order to operate average of \$374 million on goods and services, with approximately \$18 million spent locally.

3.3.2 Retention Programs

Diablo Canyon's latest retention scheme is an updated, four-tiered bonus program to incentivize employees to stay until the plant's extended closure in 2030. It was developed by PG&E following the 2022 law (SB 846) that reversed the plant's planned decommissioning and relies on state funding to keep the highly-specialized workforce in place.

Rationale and background

The retention scheme was created to avoid the potential loss of experienced and knowledgeable employees who are needed to operate the plant reliably and safely until its extended shutdown.

- The plant's initial 2025 retirement plan prompted many long-term employees to consider other opportunities or retire early.

- The reversal of the decommissioning and the new 2030 closure deadline meant PG&E had to act quickly to retain its workforce to prevent operational inefficiencies.
- An earlier 2018 retention plan that also offered 25% bonuses was deemed too generous by the California Public Utilities Commission (CPUC) at the time, which scaled it back to 15%. However, in 2024, the CPUC ultimately approved the updated 25% bonus structure as part of a settlement agreement.

Key components of the scheme

- **Annual bonuses:** Eligible employees receive an annual incentive payment of 25% of their base pay. This rate is consistent with a previous retention plan that incentivized workers to remain during the originally scheduled closure process.
- **Four-tiered structure:** The new program differs from the previous two-tiered version by introducing four commitment periods. This provides shorter incentive cycles to adapt to the changing demographics of the workforce, particularly employees nearing retirement during the extended operations.
- **Total cost estimate:** The total estimated cost of the retention program for the period covering September 1, 2023, through November 1, 2030, is approximately \$390 million. Cost details:
 - The \$390 million figure is the agreed-upon direct cost of the program.
 - It does not include payroll taxes, fees, and other adjustments, which will be added to the total.
 - The actual amount of employee payments made over the period may vary and is unknown at this time. For the purposes of this assessment, it is assumed that the full allocation is spent in equal increments over a ten year period (i.e. \$39 million per year). It is further assumed that retention costs are allocated only to technical production staff in the San Luis Obispo and Santa Barbara areas.
 - Pacific Gas and Electric (PG&E) will record the incurred expenses through a special balancing account and recover the costs from customers.

- **State mandate:** The extension of the retention program was mandated by Senate Bill 846, which also approved a state loan to PG&E to help fund continued operations.

Cost recovery: PG&E will recover the costs of the retention program from ratepayers through the annual forecast and cost-recovery process. This places the burden of the bonuses on customers, not shareholders.

3.3.3 Nonlabor Operating Expenses

The other important information on nonlabor operating expenses relates to origin of the inputs being purchased. As we see in Table 3.2, total outlays for inputs varies quite substantially, with DCPD directing over two-thirds of its spending outside California and about 10% outside the US. Just as important is the composition of this spending, which goes for different goods and services by origin market. Table 3.2 aggregates very detailed DCPD expenditure data to elucidate these spending patterns.

Table 3.2: Nonlabor Operating Expenditures by NAICS Code and Origin of Goods and Services

NAICS-1	Sector	SLO	SB	CA	USA
11	AgForFsh	.00%	.00%	.00%	.00%
21	Mining	.00%	.00%	.01%	.05%
22	Utilities	.00%	.00%	.20%	16.12%
23	Construction	3.13%	27.04%	.18%	1.57%
31	Mfg-Metal	.00%	.00%	.00%	.02%
32	Mfg-Mach	.25%	31.27%	.01%	.05%
33	Mfg-Lite	1.23%	7.10%	.29%	7.71%
42	WhlSlTrade	.00%	.00%	.00%	.00%
44	Retail 1	.00%	.00%	.00%	.00%
45	Retail 2	.00%	.00%	.00%	.00%
48	Trasnport	.00%	.00%	.11%	.19%
49	Logistics	.00%	.00%	.00%	.00%
51	Information	.00%	.00%	.00%	.00%
52	FinInsurance	.00%	.00%	.00%	.00%
53	Real Estate	.00%	.80%	.02%	.03%
54	ProfSciTech	14.09%	3.85%	8.60%	59.78%
55	MgmtCos	.00%	.00%	.00%	.00%
56	WasteMgmt	49.62%	19.40%	1.69%	4.43%

61	Education	.58%	.00%	.01%	.07%
62	HealthCare	.61%	7.67%	.02%	.02%
71	ArttEntRec	.00%	.00%	.00%	.00%
72	Hospitality	.00%	.00%	.09%	.09%
81	OthPrvSrv	26.72%	2.88%	.60%	9.88%
92	PubAdmin	.00%	.00%	.00%	.00%

3.3.4 Facility Revenues

The issue of revenue is quite complex, and although the value of DCPD power output is measured in \$ billions, this revenue accrues to PG&E's systemwide operations and only some fraction of this money returns to the local economy. Previous work has considered revenue from electricity sales as another potential economic impact of DCPD operation, but others argue that expenditures and payroll represent a more accurate proxy of income to local operations. Some net income or profit would also normally accrue to a local business, but again this systemwide financial benefit is not returned directly to the generating location. The present study follows this logic, assuming that DCPD essentially breaks even and all-inclusive costs (labor, nonlabor, taxes, fees, etc.) represent the total net local economic stimulus of extending facility operations. Profits would be beneficial to the overall economy, but given that PG&E is a statewide IOU remaining profits from DCPD do not stay entirely within the region.

3.3.5 Taxes, Fees, and Contributions to Public Institutions

As of mid-2025, Diablo Canyon contributes over \$15.1 million annually in property taxes to San Luis Obispo (SLO) County and its communities. However, the overall taxes and fees are more complex due to the plant's extension and changing financial landscape.

Local taxes and contributions

- **Property taxes:** For the 2023–2024 period, the plant generated over \$15.1 million in property taxes for SLO County.
- **Diablo Canyon Depreciation and Unitary Taxes:** The Legislature sets tax policy, including decisions on tax rates and regulations. Including the \$85 million Community Impact Mitigation Program, PG&E has paid more than \$185,000,000 to San Luis Obispo County since 2018. Any changes to the tax structure for Diablo Canyon will require further legislative action.

The state needs to adjust the tax methodology/structure for Diablo Canyon in order to reinstate the unitary tax payments. Additionally, PG&E has been neutral on tax assessments that are fair on evaluations of assets; however, it's important to note, like any business, all taxes are passed onto customers through the cost of service – in our case, the cost of electricity.

This issue was raised by the County of San Luis Obispo and the San Luis Coastal Unified School District during legislation and since the passage of SB 846.

Legislature has taken no action and PG&E cannot initiate taxation, it's responsibility as the legislative branch of the State government.

- **Declining revenue:** Property tax revenue has been significantly reduced because, since extension in 2022, Diablo Canyon's unitary tax payments have been zero because the plant's value was fully depreciated. Local officials are lobbying for the California State Board of Equalization (BOE) to reinstate these payments, but no change has yet been announced.
- **Local government concern:** Local government and school officials are concerned that the revenue will not be restored to previous levels, despite the plant's extended life, which is impacting the budget for schools, police, fire, and other services.
- **Community Impact Mitigation Program:** PG&E contributes to this program, which benefits local schools and communities.

State fees and ratepayer charges

- **Volumetric Performance Fee:** A statewide fee, set by statute at \$13 per megawatt-hour, is charged to customers of PG&E and other California utilities to compensate for the extended operation of the plant.
- **Ratepayer costs:** In December 2024, the California Public Utilities Commission (CPUC) approved \$722.6 million in ratepayer costs to cover extended operations through the end of 2025.
- **Outage-related payments:** In July 2025, the CPUC ordered PG&E to pay \$43.2 million from shareholder funds back to ratepayers due to an outage at the plant's second unit. The CPUC determined that PG&E's mismanagement of the generator caused the outage.

Federal taxes

- Federal taxes, which include corporate and social security taxes, were last reported in the 2013 study. These figures are not current and do not reflect the plant's changed status.

For the 2023–2024 fiscal year, the \$15.1 million in property taxes from Diablo Canyon was distributed among San Luis Obispo County's government, local school districts, and other community services. Specific breakdowns for this period are not publicly detailed by the county, but historical distribution patterns and recent tax revenue shifts provide a general outline of how the funds are likely allocated.

Factors influencing the breakdown

- **PG&E depreciation:** Property tax revenue has declined significantly because PG&E has fully depreciated the plant down to its land value. This means that despite the extended operation, the assessed property value remains low, severely impacting the tax payments to local entities.
- **Voter-approved taxes:** While the base property tax rate in California is 1%, additional revenue is often collected through voter-approved special taxes, parcel taxes, and school bonds for specific local projects or services.
- **Local allocations:** Based on statewide property tax collection patterns, schools and community colleges often receive the largest share, followed by counties, cities, and special districts.

Affected local entities

Based on previous fiscal years and recent statements, the \$15.1 million in property taxes would have been distributed to the following key entities in San Luis Obispo County:

- **San Luis Coastal Unified School District (SLCSD)**
: Historically one of the largest beneficiaries of Diablo Canyon's property taxes, the district saw its revenue from the plant drop from \$10.5 million in 2016–17 to just \$3.7 million in 2024–25.

- **San Luis Obispo County government:** The county government uses these funds to support police, fire, parks, and other essential county services.
- **Avila Harbor District**
: A special district that has also received funding from Diablo Canyon property taxes.
- **Nearby cities:** Other cities within San Luis Obispo County would also have received a portion of the tax revenue to fund their local services.

Community Impact Mitigation Program

It is important to note that PG&E also makes additional contributions to the **Community Impact Mitigation Program (CIMP)**, which benefits local schools and communities separately from the property tax payments. These funds are intended to offset local impacts associated with the plant's decommissioning or, in this case, its continued operation.

The CIMP was initially established as part of the now-voided 2016 Diablo Canyon closure settlement, was funded by PG&E to support San Luis Obispo (SLO) County and its communities. Though the California Public Utilities Commission (CPUC) originally rejected the CIMP funding request, it was ultimately authorized by state legislation (SB 1090) in 2018 to mitigate the economic effects of the plant's anticipated shutdown. The CIMP funds are generally designated for schools, local government, and other special districts to help offset lost property tax revenue. Key components and beneficiaries of the program include:

- **Local school districts:** The San Luis Coastal Unified School District (SLCSD) was a primary recipient of these funds, intended to counteract the significant decline in property taxes experienced due to the plant's low assessed value.
- **San Luis Obispo County:** The county government and other public services receive funding to help maintain essential services and budgets.
- **Special districts:** Other local entities, such as the Avila Harbor District, have also been included as recipients of the mitigation funds.

With the passage of Senate Bill 846 in 2022, which extended the plant's operation, the context of the CIMP has shifted. Instead of decommissioning, the program is now

intended to help the community manage the impacts of continued operations, including the ongoing financial strain caused by reduced property tax revenue. PG&E is authorized to recover these ongoing costs from ratepayers.

3.4 Results

Below we present our results for the IMPLAN analysis. Results are presented in three parts, measuring effects individually on San Luis Obispo and Santa Barbara counties, then on the state of California as whole. In all three cases, the “event” represents all significant dimensions of DCCP operations as described in Section 3 above.

For each section, results are presented for all formal economic activities, aggregated according to the North American Industry Classification System (NAICS) at the 2-digit level. This scheme divides the economy into twenty types¹⁹ for both economic output and employment. These sectors are themselves aggregated from the 528 IMPLAN sectors and are self-explanatory with a few exceptions.

We use the 2023 version of IMPLAN, which is the most recent available at the time of this analysis. For this reason, results in are presented 2023 dollars to limit assumptions surrounding inflation. Employment estimates are for Full Time Equivalent (FTE) positions, which represent one employee working full time (or two half-time, etc.).

3.4.1 DCCP and the San Luis Obispo Economy

Given that facility spending is concentrated almost entirely within San Luis Obispo County, it comes as no surprise that the largest effects are to be seen here. In Table 3.3, total value added or Gross State Product (GSP) from the sector is estimated at roughly \$317 million per year, while the impact on overall SLO GSP is estimated to be \$420 million per year. The largest impacted sectors are spread across those affected from payrolls, nonlabor input demand, etc. Most of the multiplier effects are induced (\$100 million) rather than indirect (about \$3 million), passing through payrolls and contracting to local real estate and other services (e.g. homeownership and real estate, restaurants, medical). This imbalance is to be expected for a highly specialized technical facility like DCCP, where payrolls are the primary linkage to local markets, and it highlights the importance of recognizing so called general equilibrium economic impacts.

¹⁹ See <https://www.census.gov/programs-surveys/economic-census/year/2022/guidance/understanding-naics.html> for details.

Table 3.3: Total Annual Economic Impact of Extending DCPD Operations, San Luis Obispo County (Annual change in Industry value-added in 2023 Dollars)

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	Utilities	\$ 316,501,947	\$ 1,910,239	\$ 698,391	\$ 319,110,576
2	RealEstate	\$ -	\$ 79,691	\$ 29,336,741	\$ 29,416,433
3	HealthCare	\$ -	\$ 7	\$ 15,661,659	\$ 15,661,667
4	RetailTrade	\$ -	\$ 33,362	\$ 15,048,387	\$ 15,081,749
5	Hospitality	\$ -	\$ 34,612	\$ 9,085,946	\$ 9,120,558
6	OthPrivServ	\$ -	\$ 15,347	\$ 5,701,539	\$ 5,716,886
7	FinInsurance	\$ -	\$ 128,473	\$ 4,718,436	\$ 4,846,909
8	WhlSalTrade	\$ -	\$ 68,710	\$ 4,029,447	\$ 4,098,157
9	ProfSciTech	\$ -	\$ 289,455	\$ 3,516,318	\$ 3,805,774
10	Information	\$ -	\$ 77,433	\$ 2,611,156	\$ 2,688,589
11	WasteMgmt	\$ -	\$ 160,423	\$ 2,220,447	\$ 2,380,870
12	Transport	\$ -	\$ 103,983	\$ 1,860,372	\$ 1,964,356
13	ArtEntRec	\$ -	\$ 3,838	\$ 1,911,634	\$ 1,915,472
14	Education	\$ -	\$ 421	\$ 1,242,468	\$ 1,242,888
15	Construction	\$ -	\$ 75,092	\$ 917,721	\$ 992,813
16	Manufacturing	\$ -	\$ 55,246	\$ 868,606	\$ 923,852
17	GovtEnt	\$ -	\$ 12,306	\$ 533,424	\$ 545,730
18	MgmtEnt	\$ -	\$ 4,150	\$ 347,451	\$ 351,601
19	AgForFsh	\$ -	\$ 447	\$ 218,224	\$ 218,671
20	MiningMin	\$ -	\$ 9,345	\$ 65,923	\$ 75,268
21	Non-NAICS	\$ -	\$ -	\$ -	\$ -
22	PubAdmin	\$ -	\$ -	\$ -	\$ -
	Total	\$316,501,947	\$3,062,580	\$100,594,290	\$420,158,818

Figure 3.1: Total Annual Economic Impact of Extending DCPD Operations, San Luis Obispo County, (2023 Dollars Annually)

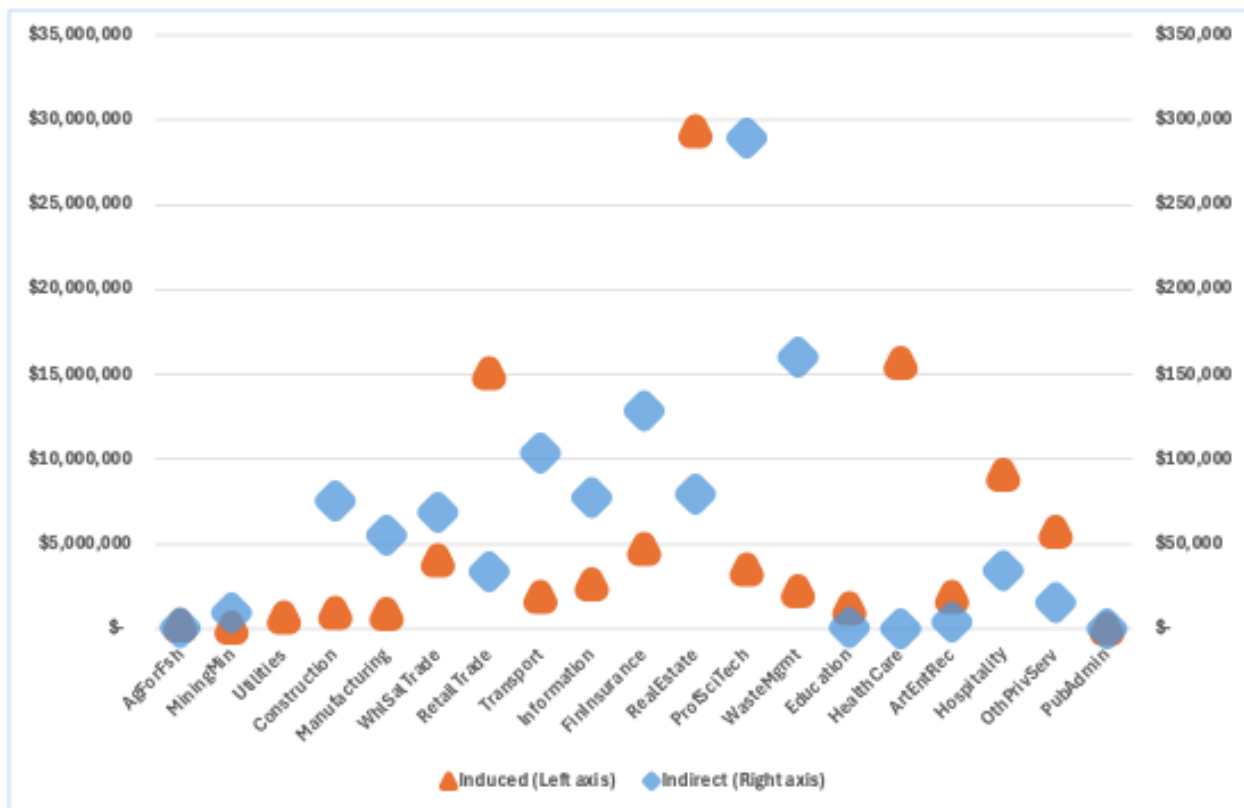


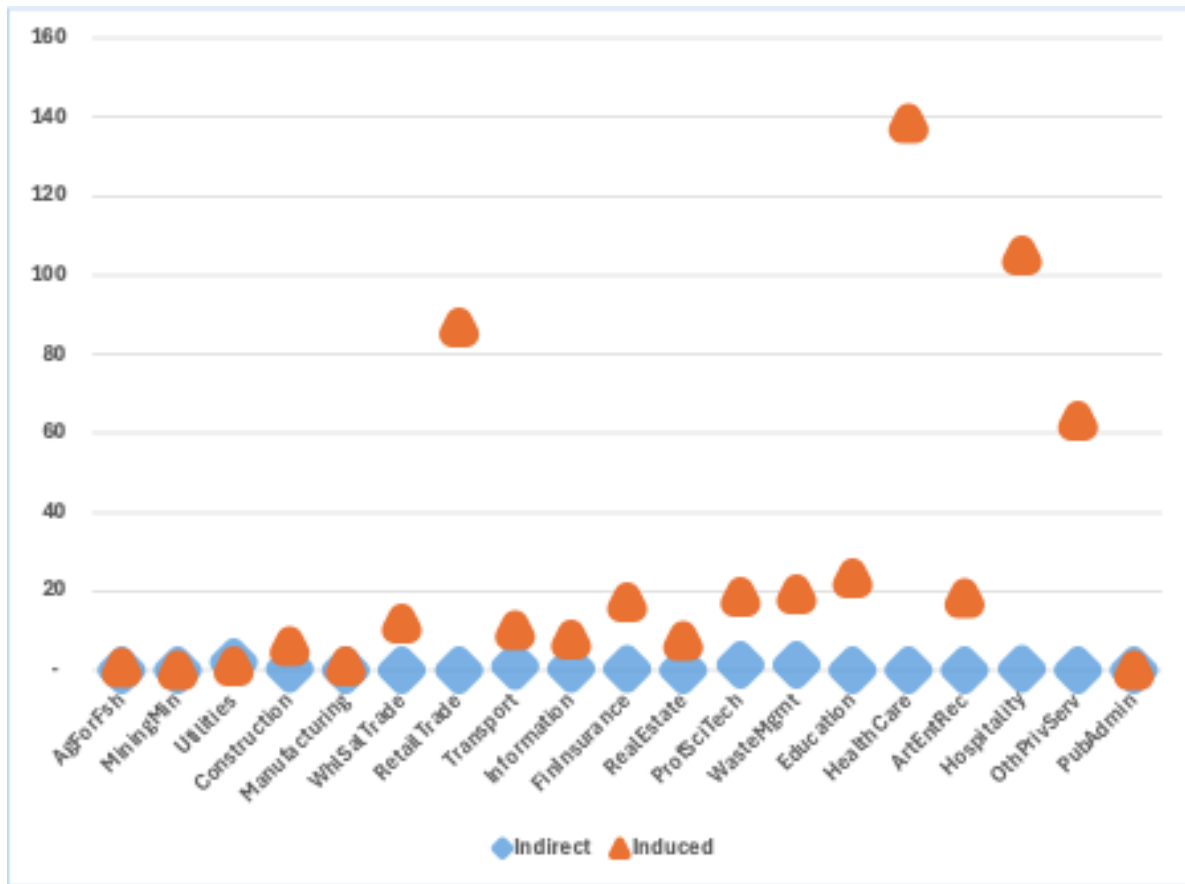
Figure 3.1 illustrates the diverse impacts of DCPD operations, order this time by sector rather than magnitude. Because induced impacts are so much greater than indirect ones, two difference vertical scales are used. Adjusting for this average difference, however, the great diversity of DCPD’s beneficial economic spillovers is quite apparent. The facility’s primary service might be provision of clean electric power, but its local benefits are significant and quite extensive across the local economy.

Regarding job creation, we find widespread benefits impacts for San Luis Obispo County. Table 3.4 suggests that DCPD is responsible for increases in direct employment in its own operations, but also for about 54% more new jobs linked to “upstream” suppliers (about 1%) and “downstream” services (53%). Full accounting of payroll and other expenditures identifies at least 1,015 FTE jobs directly associated with facility expense, while another 551 FTE jobs are supported annually by indirect and induced economic stimulus from DCPD. Induced job creation is primarily in service sectors, which is a logical payroll multiplier effect. In California, 70% of GSP is household consumption and 70% of household consumption is for services. In a post-industrial economy like ours, about half (49%) of our income is spent on service sectors. This means that, although DCPD employees represent higher than average income households, their spending stimulates much more inclusive economic opportunity across the region.

**Table 3.4: Total Annual Jobs Impact of Extending DCP Operations,
San Luis Obispo County (Change in Industry FTE Employment in 2023 Dollars)**

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	Utilities	1,015.72	2.19	1.20	1,019.11
2	RealEstate	-	1.44	18.60	20.04
3	HealthCare	-	1.32	19.31	20.63
4	RetailTrade	-	0.92	10.27	11.20
5	Hospitality	-	0.44	6.04	6.48
6	OthPrivServ	-	0.41	17.20	17.61
7	FinInsurance	-	0.40	105.00	105.40
8	WhlSalTrade	-	0.25	7.81	8.06
9	ProfSciTech	-	0.18	11.93	12.10
10	Information	-	0.15	7.50	7.66
11	WasteMgmt	-	0.13	86.85	86.98
12	Transport	-	0.09	4.04	4.12
13	ArtEntRec	-	0.08	62.98	63.06
14	Education	-	0.06	1.15	1.20
15	Construction	-	0.03	2.55	2.58
16	Manufacturing	-	0.01	18.18	18.20
17	GovtEnt	-	0.01	23.35	23.35
18	MgmtEnt	-	0.01	0.03	0.04
19	AgForFsh	-	-	0.75	0.75
20	MiningMin	-	-	138.43	138.43
21	Non-NAICS	-	-	-	-
22	PubAdmin	-	-	-	-
	Total	1,015.72	8.12	543.17	1,567.00

Figure 3.2: FTE Annual Jobs Impact of Extending DCPD Operations, San Luis Obispo County (Change in Industry Employment in 2023 Dollars)



The following tables and figures summarize DCPD's fiscal impacts on the SLO economy. Despite the uncertainty surrounding the Unitary Tax, it is clear from these results that DCPD makes very substantial contributions to public finances at the local, state, and national levels. Table 3.5 reports total state revenue, and here that, as a result of the stimulus originating with DCPD and generating new GSP across the SLO economy, payroll taxes would increase by over \$1.7 million and producer taxes by over \$26 million. Meanwhile, SLO households will pay over \$8 million and enterprises over \$22 million in state and local income taxes as a direct, indirect, and induced result of DCPD operations. In summary, state and local coffers take in about \$59 million more every year because of DCPD operations.

At the Federal level, incremental revenue from SLO sources linked to DCPD are even larger, comprising \$45 million in social insurance taxes, \$1.3 million in production taxes, \$32.2 and \$1.8 million from Household and Corporate income taxes, respectively. The total Federal fiscal contribution attributable to DCPD operations is over \$80 million annually, and this takes no account of systemwide fees on DCPD power output.

Table 5.5: State and Local Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax- Employee Contribution	\$ 808,101			\$ 808,101	\$ 1,616,202
Social Insurance Tax- Employer Contribution	\$ 950,193			\$ 950,193	\$ 1,900,386
TOPI: Sales Tax		\$ 12,397,026		\$ 10,020,370	\$ 22,417,396
TOPI: Property Tax		\$ 12,077,093		\$ 349,087	\$ 12,426,180
TOPI: Motor Vehicle License		\$ 305,238		\$ 303,271	\$ 608,508
TOPI: Severance Tax		\$ 12,282		\$ 12,282	\$ 24,565
TOPI: Other Taxes		\$ 1,513,622		\$ 703,837	\$ 2,217,459
TOPI: Special Assessments		\$ 298,158			\$ 298,158
OPI: Corporate Profits Tax				\$ 949,442	\$ 949,442
Personal Tax: Income Tax			\$ 8,219,581	\$ 8,219,581	\$ 16,439,162
Total State and Local Tax Payments	\$ 1,758,294	\$ 26,603,419	\$ 8,219,581	\$ 22,316,164	\$ 58,897,457

Figure 3.3: State and Local Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)

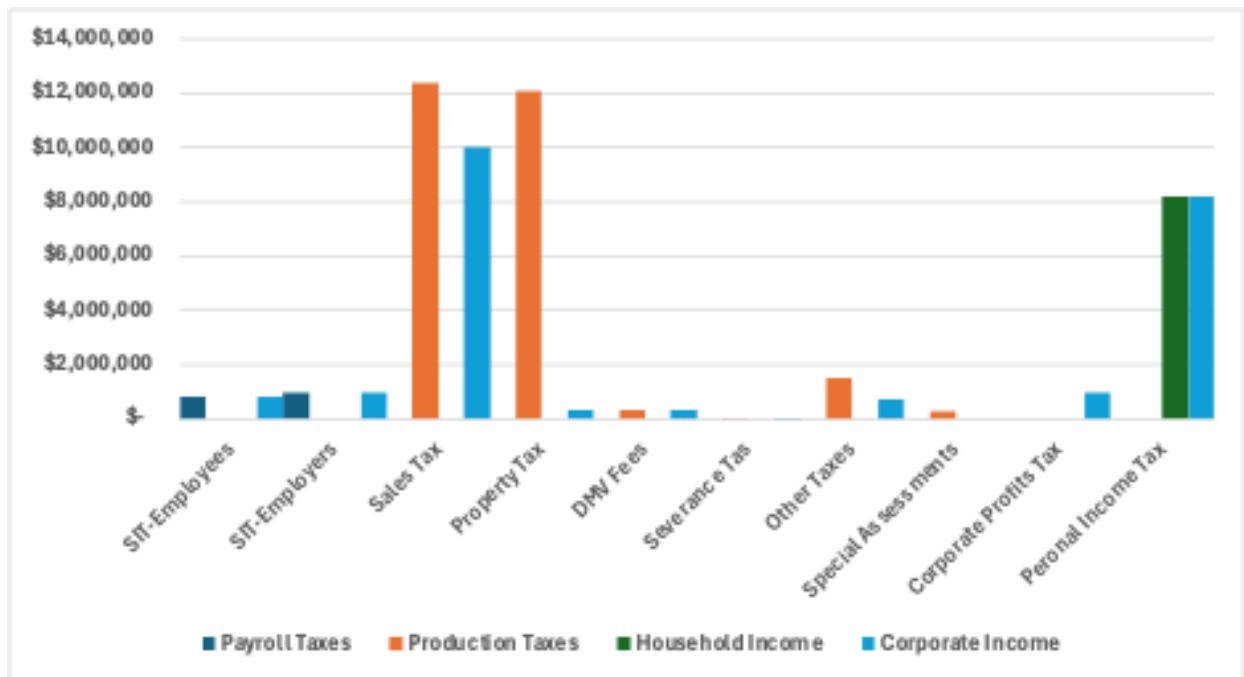
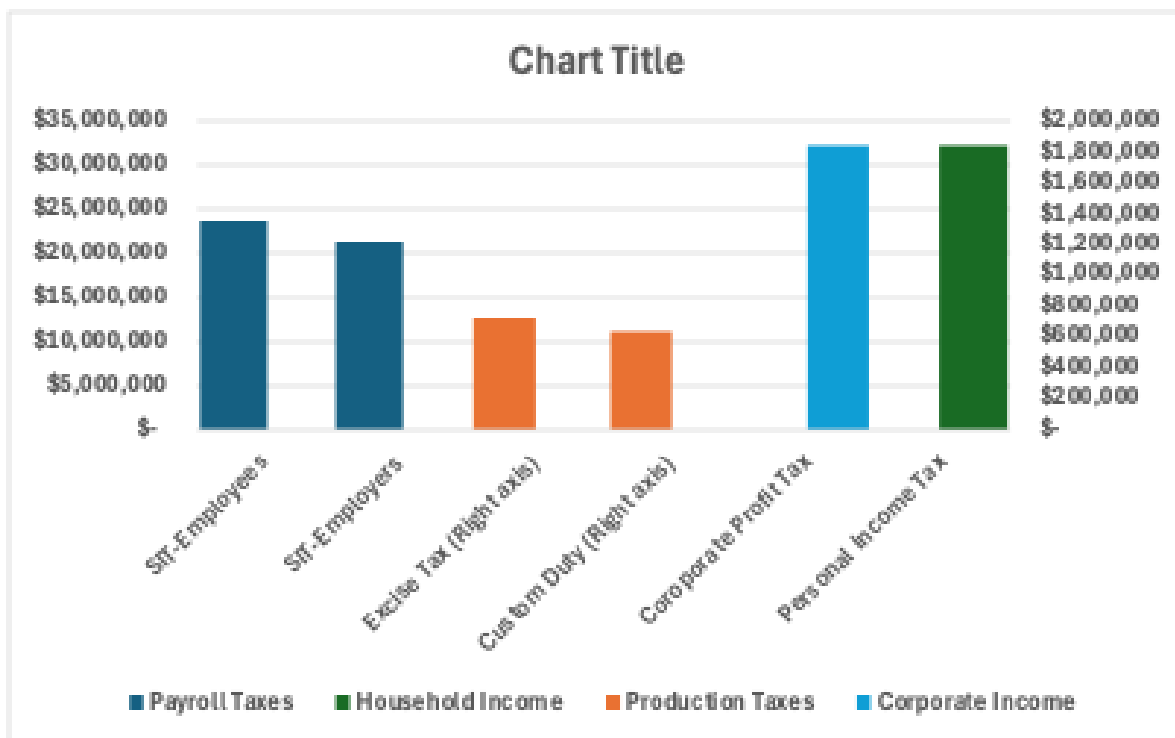


Table 3.6: Federal Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax- Employee Contribution	\$ 23,704,197				\$ 23,704,197
Social Insurance Tax- Employer Contribution	\$ 21,327,718				\$ 21,327,718
TOPI: Excise Taxes		\$ 726,161			\$ 726,161
TOPI: Custom Duty		\$ 640,117			\$ 640,117
OPI: Corporate Profits Tax				\$ 1,841,214	\$ 1,841,214
Personal Tax: Income Tax			\$ 32,158,246		\$ 32,158,246
Total Federal Tax Payments	\$ 45,031,915	\$ 1,366,278	\$ 32,158,246	\$ 1,841,214	\$ 80,397,652

Figure 3.4: Federal Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)



Turning now to the same assessment for Santa Barbara (SB), the results are qualitatively similar but much smaller for two reasons. Firstly, this county's population of DCPD workers is much smaller than SLO and facility linkages to the SB economy are much less extensive. Technically, this means that all three categories of effects are smaller, Direct effects because of a smaller constituency and indirect/induced effects because of weaker economic links to operations. Having said this the results remain economically important, with DCPD operations generating direct income of \$32 million and indirect or induced income of \$11.7 million every year.

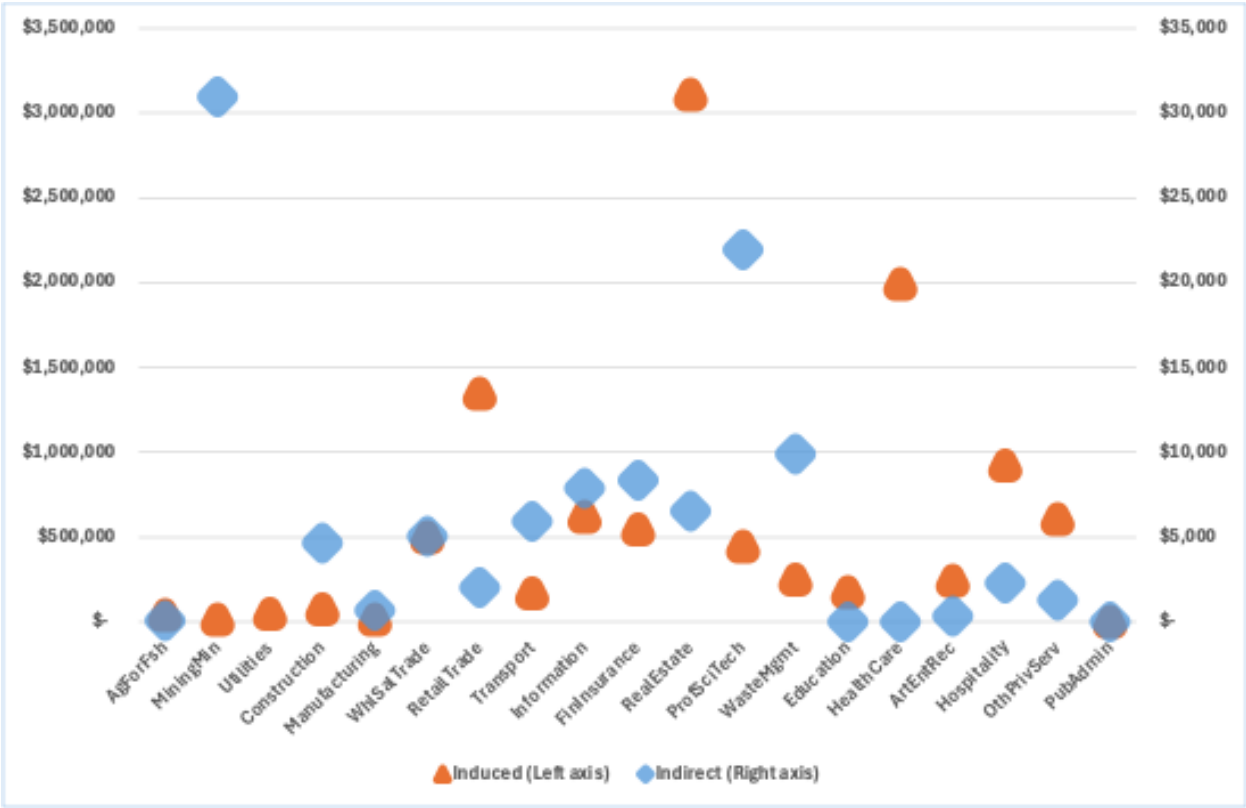
Since payrolls are the main source of DCPD stimulus here, the importance of indirect and induced effects is even more important. For SLO, these multiplier effects were 31% the magnitude of direct effects, while the corresponding figure for SB is 37%. Thus, we see significantly more diverse stimulus across the SB local economy, but in terms of income and employment effects. Summarized in Table 3.7, the latter show that about half an additional FTE job is created in SB for every DCPD job holder residing in the county. Moreover Figure 3.5 reveals again that the diversity of this robust indirect and induced job creation, with services again dominating.

From a fiscal perspective, DCPD contributions to state and Federal coffers via the SB "channel" are smaller because the primary stimuli, project expenditures, is almost exactly 10% (\$31,925,950 vs \$321,128,165) that applied to SLO. Even so, fiscal revenues follow a very similar pattern and are by no means trivial at the state (\$2.3 million) or Federal (\$8.2) million. Again, these revenues take no account of fees or other taxes assessing on DCPD power production and delivery.

**Table 3.7: Total Annual Economic Impact of Extending DCP Operations,
Santa Barbara County (Annual change in Industry value-added in 2023 Dollars)**

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	Utilities	\$ 32,142,689	\$ 94,927	\$ 45,116	\$ 32,282,732
2	RealEstate		\$ 6,552	\$ 3,112,707	\$ 3,119,260
3	HealthCare		\$ 1	\$ 1,991,121	\$ 1,991,121
4	RetailTrade		\$ 2,000	\$ 1,348,098	\$ 1,350,099
5	Hospitality		\$ 2,281	\$ 923,146	\$ 925,428
6	Information		\$ 7,887	\$ 618,151	\$ 626,038
7	OthPrivServ		\$ 1,302	\$ 602,923	\$ 604,224
8	FinInsurance		\$ 8,377	\$ 545,577	\$ 553,954
9	WhlSalTrade		\$ 5,064	\$ 495,642	\$ 500,706
10	ProfSciTech		\$ 21,939	\$ 444,981	\$ 466,920
11	WasteMgmt		\$ 9,913	\$ 248,245	\$ 258,159
12	ArtEntRec		\$ 322	\$ 242,689	\$ 243,011
13	MgmtEnt		\$ 1,943	\$ 227,028	\$ 228,971
14	GovtEnt		\$ 2,987	\$ 197,834	\$ 200,821
15	Education		\$ 32	\$ 176,638	\$ 176,669
16	Transport		\$ 5,934	\$ 168,442	\$ 174,376
17	Construction		\$ 4,670	\$ 72,067	\$ 76,737
18	MiningMin		\$ 30,990	\$ 14,690	\$ 45,680
19	AgForFsh		\$ 46	\$ 40,146	\$ 40,192
20	Manufacturing		\$ 669	\$ 16,814	\$ 17,483
21	Non-NAICS				
22	PubAdmin				
	Total	\$ 32,142,689	\$ 207,836	\$ 11,532,055	\$ 43,882,580

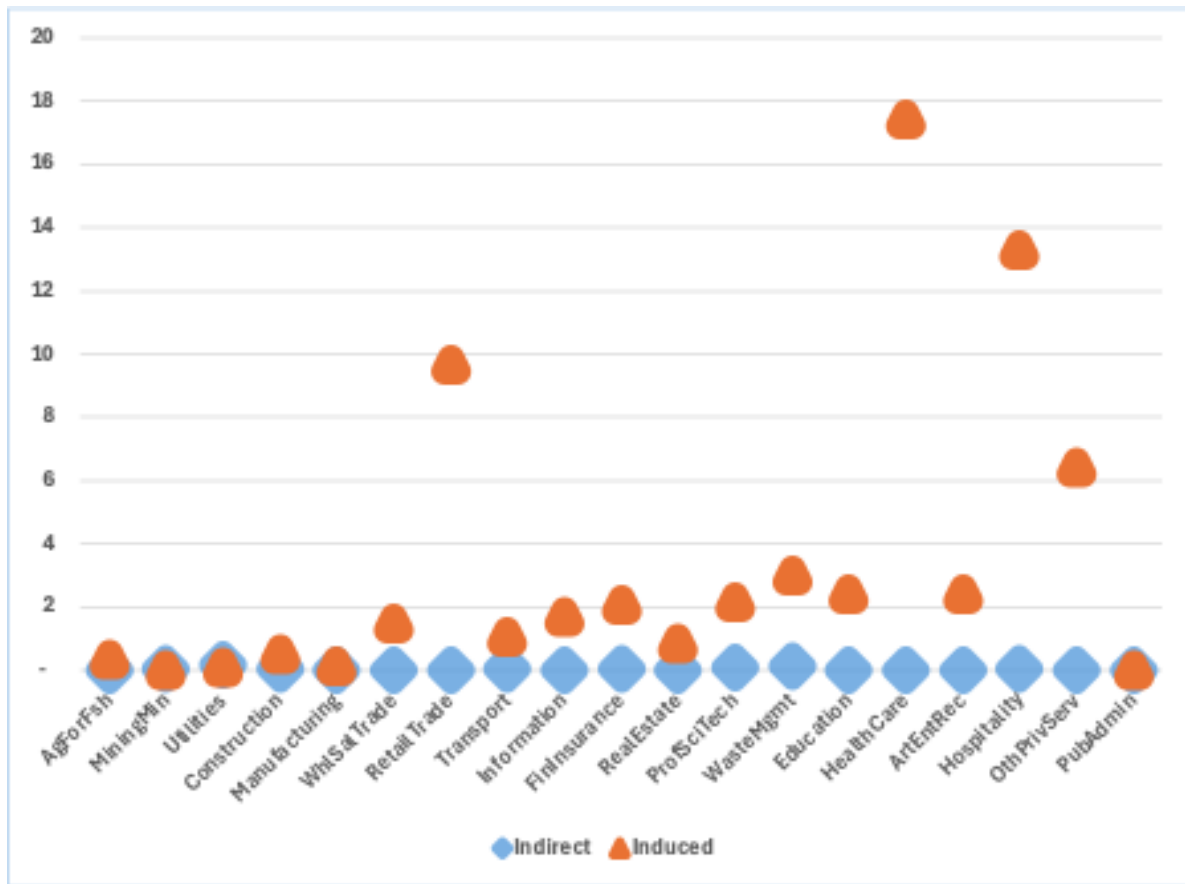
Figure 3.5: Total Annual Economic Impact of Extending DCPD Operations, Santa Barbara County, (2023 Dollars Annually)



**Table 3.8: Total Annual Jobs Impact of Extending DCPD Operations,
Santa Barbara County (Change in Industry FTE Employment in 2023 Dollars)**

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	Utilities	141.00	0.16	0.08	141.23
2	WasteMgmt		0.15	3.01	3.15
3	ProfSciTech		0.10	2.17	2.27
4	MiningMin		0.04	0.02	0.06
5	Transport		0.04	1.06	1.09
6	Hospitality		0.03	13.30	13.33
7	Construction		0.03	0.51	0.54
8	FinInsurance		0.03	2.07	2.10
9	Information		0.02	1.67	1.69
10	GovtEnt		0.02	1.39	1.41
11	WhlSalTrade		0.01	1.49	1.50
12	RealEstate		0.01	0.84	0.85
13	RetailTrade		0.01	9.66	9.67
14	MgmtEnt		0.01	0.80	0.80
15	OthPrivServ		0.01	6.43	6.44
16	Manufacturing			0.11	0.11
17	ArtEntRec			2.41	2.41
18	AgForFsh			0.34	0.34
19	Education			2.39	2.39
20	HealthCare			17.44	17.44
21	Non-NAICS				
22	PubAdmin				
	Total	141.00	0.67	67.19	208.82

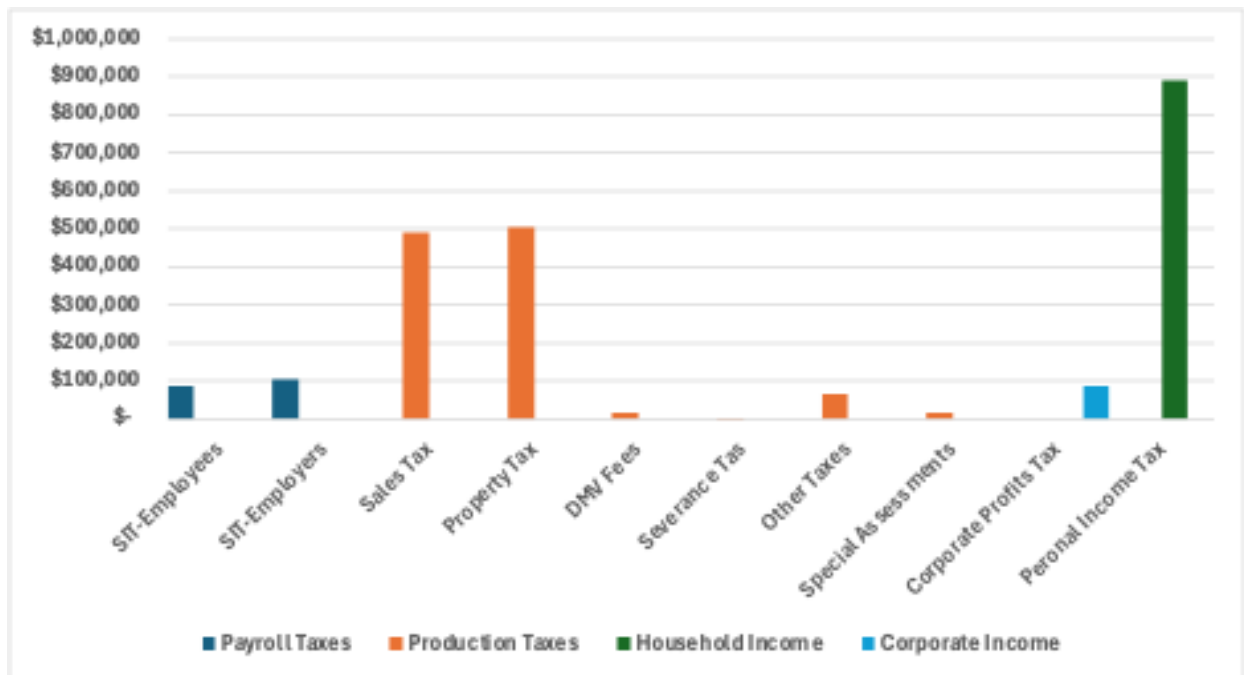
Figure 3.6: FTE Annual Jobs Impact of Extending DCPD Operations, Santa Barbara County (Change in Industry Employment in 2023 Dollars)



**Table 3.9: State and Local Tax Impact of Extending DCPD Operation,
Santa Barbara County, (2023 Dollars Annually)**

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax-Employee Contribution	\$ 88,078				\$ 88,078
Social Insurance Tax-Employer Contribution	\$ 103,566				\$ 103,566
TOPI: Sales Tax		\$ 491,819			\$ 491,819
TOPI: Property Tax		\$ 503,409			\$ 503,409
TOPI: Motor Vehicle License		\$ 14,830			\$ 14,830
TOPI: Severance Tax		\$ 598			\$ 598
TOPI: Other Taxes		\$ 65,875			\$ 65,875
TOPI: Special Assessments		\$ 17,148			\$ 17,148
OPI: Corporate Profits Tax				\$ 86,454	\$ 86,454
Personal Tax: Income Tax			\$ 890,443		\$ 890,443
Total State and Local Tax Payments	\$ 191,644	\$ 1,093,679	\$ 890,443	\$ 86,454	\$ 2,262,219

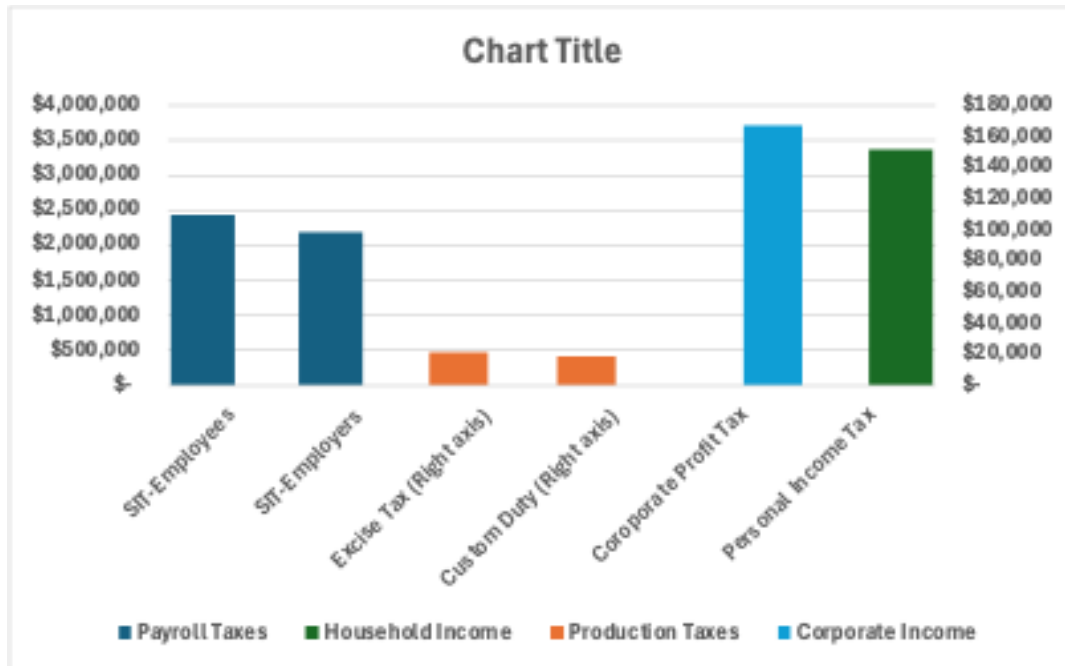
Figure 3.7: State and Local Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)



**Table 3.10: Federal Tax Impact of Extending DCPD Operation,
Santa Barbara County, (2023 Dollars Annually)**

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax- Employee Contribution	\$ 2,428,789				\$ 2,428,789
Social Insurance Tax- Employer Contribution	\$ 2,185,289				\$ 2,185,289
TOPI: Excise Taxes		\$ 20,840			\$ 20,840
TOPI: Custom Duty		\$ 18,371			\$ 18,371
OPI: Corporate Profits Tax				\$ 167,656	\$ 167,656
Personal Tax: Income Tax			\$ 3,376,780		\$ 3,376,780
Total Federal Tax Payments	\$ 4,614,078	\$ 39,211	\$ 3,376,780	\$ 167,656	\$ 8,197,725

Figure 3.8: Federal Tax Impact of Extending DCPD Operation, San Luis Obispo County, (2023 Dollars Annually)



3.4.2 Results for California

To reiterate, the California “event” modeling DCPD operations takes account of the entire state economy, not considering effects that are net of SLO and SB counties. In this way the results are closely related to those in the previous two subsections, but because California is its own jurisdiction they need to be appraised in this way.

The first thing to highlight about these results is the fact that DCPD operations confer nearly twice the direct benefits across California as they do to the two counties where their operations are concentrated (\$601 million vs \$349 million). This is not double counting, but a simple consequence of the fact that the utility sector is the primary buyer and distributor of DCPD output. Nearly every dollar of production cost corresponds to a dollar of added demand for systemwide distribution and marketing services, creating direct (Utility sector) value added and jobs (2,228 vs 1,156) across the state.

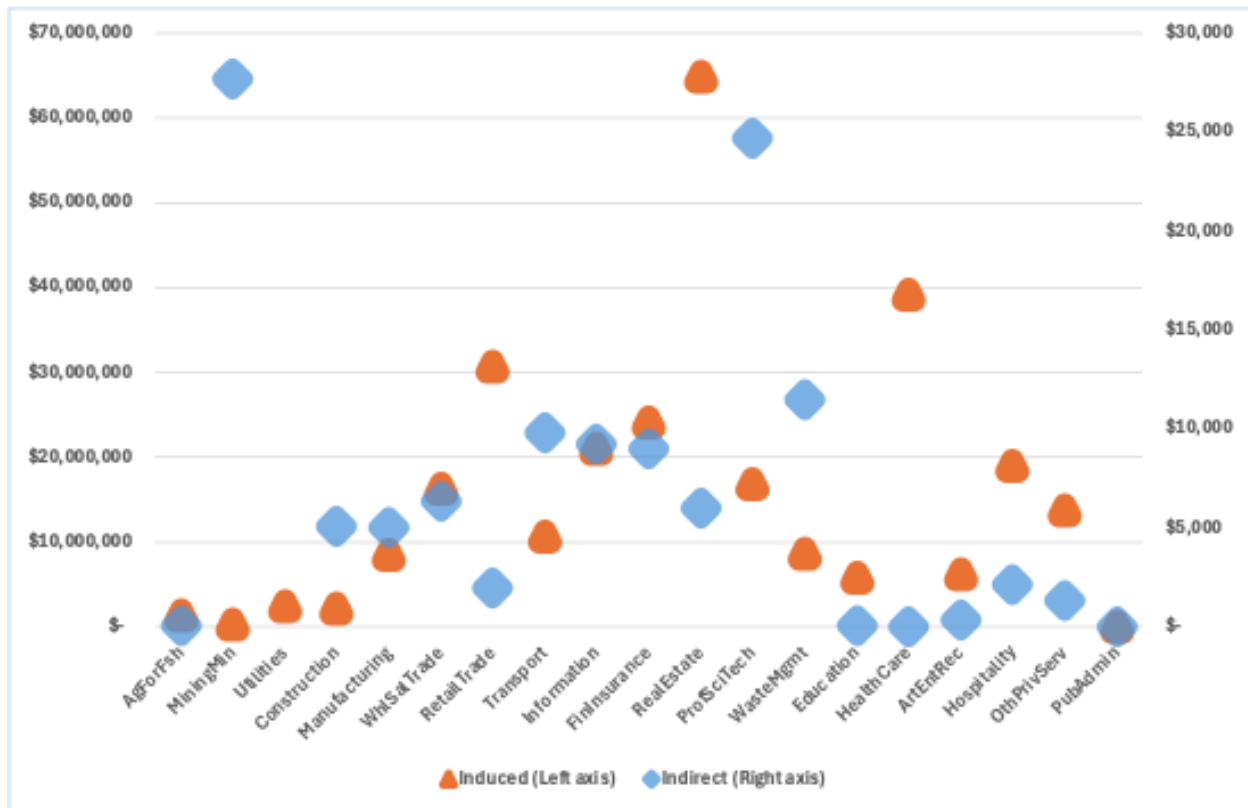
Another salient insight from these results is that, because expenditure chains are much longer across a much larger highly diversified state economy, indirect and induced impacts are much larger (more than 70% of direct effects). In terms of the two gold standards of economic policy, DCPD adds a total of \$901 million to annual GSP and 3,785 FTE to total employment across the state. Thus, the facility generates roughly \$3 of California income for every dollar of operating cost and over two additional FTE jobs for every one of its own production workers. For the same reason (“long” expenditure chains) Figure @ reveals that the statewide positive spillovers from DCPD are much more diversified, benefitting every sector of the economy through stronger indirect and induced impacts.

Of course, those (like PG&E) who create private income from producing private services also create public revenue, goods, and services by paying taxes. Again, the multiplier effects reveal that, in addition to any direct taxes and fees assessed on DCPD produced energy, the state can expect \$85 million in added revenue from DCPD stimulus to the state economy. This is complemented by added Federal revenues of approximately \$164 million.

**Table 3.11: Total Annual Economic Impact of Extending DCPD Operations,
State of California (Annual change in Industry value-added in 2023 Dollars)**

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	3 - 22 - Utilities	\$ 601,337,577	\$ 76,867	\$ 2,417,100	\$ 603,831,544
2	11 - 53 - Real Estate and Rental and Leasing		\$ 5,989	\$ 64,864,917	\$ 64,870,905
3	16 - 62 - Health Care and Social Assistance		\$ 0	\$ 39,208,757	\$ 39,208,757
4	7 - 44-45 - Retail Trade		\$ 1,946	\$ 30,638,560	\$ 30,640,506
5	10 - 52 - Finance and Insurance		\$ 9,024	\$ 24,147,610	\$ 24,156,634
6	9 - 51 - Information		\$ 9,234	\$ 21,043,984	\$ 21,053,218
7	18 - 72 - Accommodation and Food Services		\$ 2,154	\$ 18,955,487	\$ 18,957,640
8	12 - 54 - Professional, Scientific, and Technical Services		\$ 24,714	\$ 16,801,872	\$ 16,826,587
9	6 - 42 - Wholesale Trade		\$ 6,335	\$ 16,234,184	\$ 16,240,519
10	19 - 81 - Other Services (except Public Administration)		\$ 1,311	\$ 13,679,231	\$ 13,680,542
11	8 - 48-49 - Transportation and Warehousing		\$ 9,803	\$ 10,607,823	\$ 10,617,626
12	14 - 56 - Administrative and Support and Waste Management and Remediation Services		\$ 11,504	\$ 8,563,602	\$ 8,575,106
13	5 - 31-33 - Manufacturing		\$ 5,005	\$ 8,426,903	\$ 8,431,908
14	17 - 71 - Arts, Entertainment, and Recreation		\$ 334	\$ 6,202,971	\$ 6,203,305
15	15 - 61 - Educational Services		\$ 49	\$ 5,744,726	\$ 5,744,776
16	13 - 55 - Management of Companies and Enterprises		\$ 1,334	\$ 4,646,837	\$ 4,648,172
17	20 - 9A - Government Enterprises		\$ 23,720	\$ 3,733,422	\$ 3,757,141
18	4 - 23 - Construction		\$ 5,063	\$ 2,151,173	\$ 2,156,236
19	1 - 11 - Agriculture, Forestry, Fishing and Hunting		\$ 44	\$ 1,400,155	\$ 1,400,198
20	2 - 21 - Mining, Quarrying, and Oil and Gas Extraction		\$ 27,708	\$ 240,530	\$ 268,237
21	21 - 93 - Non-NAICS				
22	22 - 9B - Administrative Government				
	Total	\$ 601,337,577	\$ 222,138	\$ 299,709,843	\$ 901,269,558

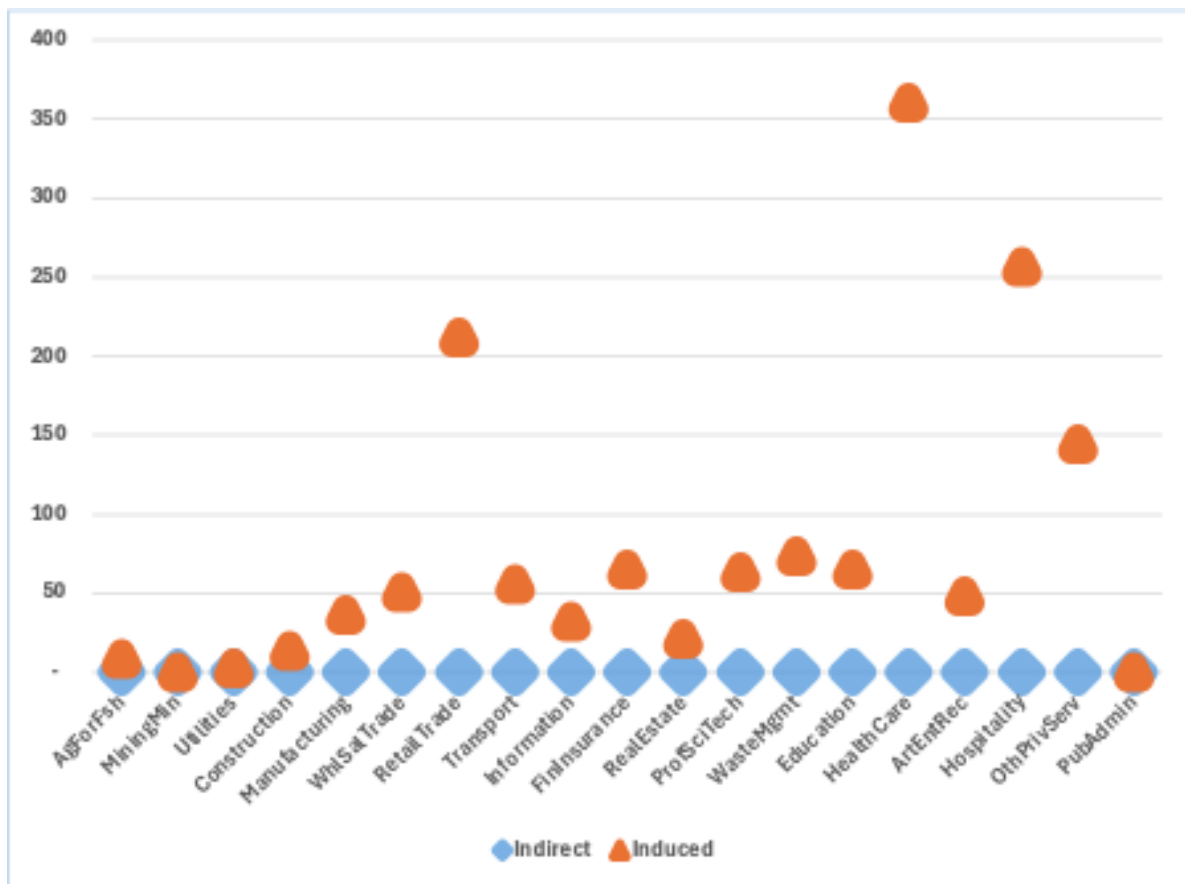
Figure 3.9: Total Annual Economic Impact of Extending DCPD Operations, State of California, (2023 Dollars Annually)



**Table 3.12: Total Annual Jobs Impact of Extending DCP Operations,
State of California (Change in Industry FTE Employment in 2023 Dollars)**

Rank	NAICS-2 Sector	Direct	Indirect	Induced	Total
1	Utilities	2,228.00	0.06	2.91	2,230.97
2	GovtEnt		0.12	26.39	26.51
3	WasteMgmt		0.10	73.65	73.75
4	ProfSciTech		0.08	63.56	63.64
5	Transport		0.06	55.44	55.50
6	MiningMin		0.03	0.22	0.25
7	Construction		0.03	13.25	13.28
8	Hospitality		0.03	256.85	256.88
9	FinInsurance		0.02	65.16	65.18
10	Information		0.02	32.52	32.54
11	WhlSalTrade		0.01	50.56	50.57
12	RetailTrade		0.01	212.24	212.25
13	RealEstate		0.01	21.24	21.25
14	Manufacturing		0.01	36.03	36.04
15	OthPrivServ		0.01	144.17	144.18
16	MgmtEnt		0.01	20.10	20.11
17	ArtEntRec			47.78	47.78
18	Education			65.28	65.28
19	AgForFsh			8.88	8.88
20	HealthCare			360.61	360.61
21	PubAdmin				
22	Non-NAICS				
	Total	2,228.00	0.61	1,556.84	3,785.45

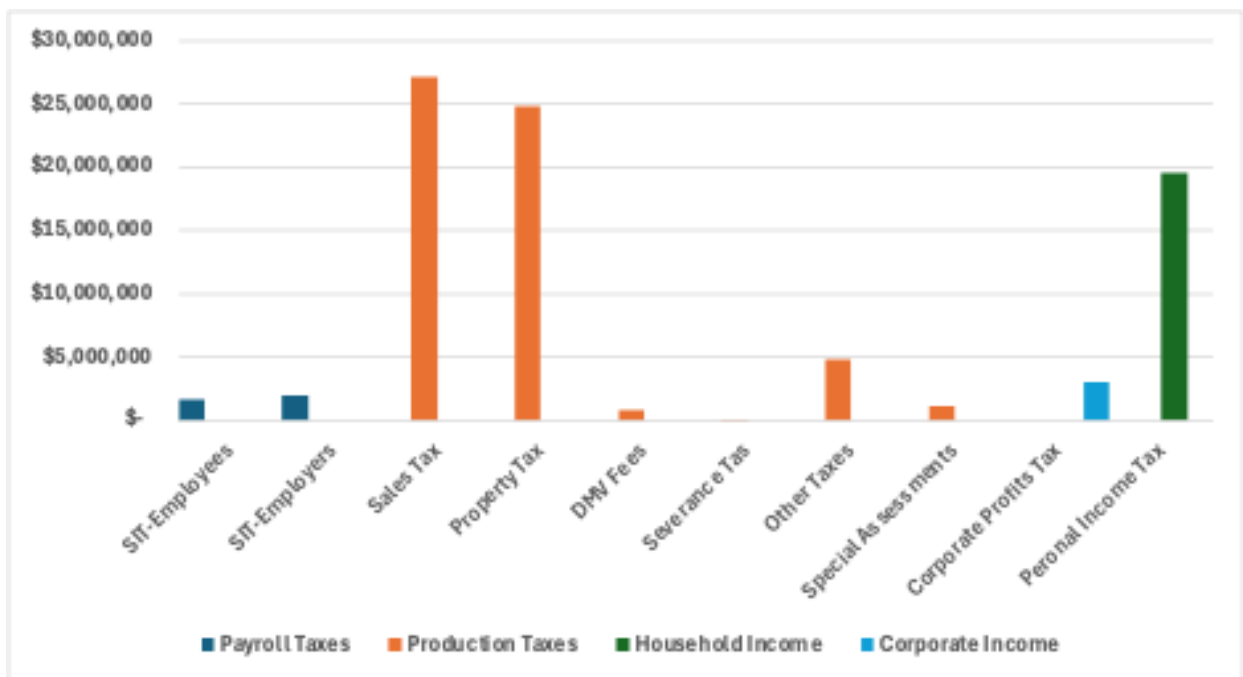
Figure 3.10: FTE Annual Jobs Impact of Extending DCP Operations, State of California (Change in Industry Employment in 2023 Dollars)



**Table 1.13: State and Local Tax Impact of Extending DCPD Operation,
State of California County, (2023 Dollars Annually)**

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax- Employee Contribution	\$ 1,637,598				\$ 1,637,598
Social Insurance Tax- Employer Contribution	\$ 1,925,543				\$ 1,925,543
TOPI: Sales Tax		\$ 27,170,826			\$ 27,170,826
TOPI: Property Tax		\$ 24,859,704			\$ 24,859,704
TOPI: Motor Vehicle License		\$ 827,834			\$ 827,834
TOPI: Severance Tax		\$ 33,638			\$ 33,638
TOPI: Other Taxes		\$ 4,803,098			\$ 4,803,098
TOPI: Special Assessments		\$ 1,159,411			\$ 1,159,411
OPI: Corporate Profits Tax				\$ 3,047,031	\$ 3,047,031
Personal Tax: Income Tax			\$ 19,521,718		\$ 19,521,718
Total State and Local Tax Payments	\$ 3,563,141	\$ 58,854,511	\$ 19,521,718	\$ 3,047,031	\$ 84,986,402

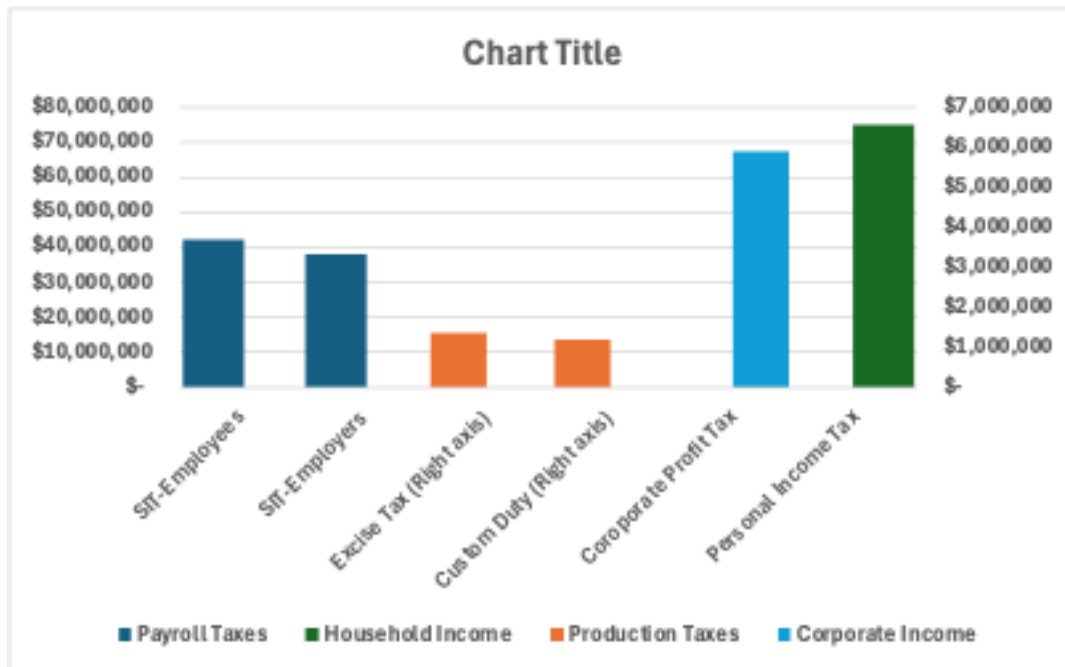
**Figure 3.11: State and Local Tax Impact of Extending DCPD Operation,
State of California County, (2023 Dollars Annually)**



**Table 3.14: Federal Tax Impact of Extending DCPD Operation,
State of California County, (2023 Dollars Annually)**

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Social Insurance Tax- Employee Contribution	\$ 42,202,178				\$ 42,202,178
Social Insurance Tax- Employer Contribution	\$ 37,971,171				\$ 37,971,171
TOPI: Excise Taxes		\$ 1,360,354			\$ 1,360,354
TOPI: Custom Duty		\$ 1,199,164			\$ 1,199,164
OPI: Corporate Profits Tax				\$ 5,908,980	\$ 5,908,980
Personal Tax: Income Tax			\$ 74,980,570		\$ 74,980,570
Total Federal Tax Payments	\$ 80,173,349	\$ 2,559,518	\$ 74,980,570	\$ 5,908,980	\$ 163,622,416

**Figure 3.12: Federal Tax Impact of Extending DCPD Operation,
State of California County, (2023 Dollars Annually)**



3.5 Conclusions

Generally, this economic impact assessment finds that DCPD operations are a potent and inclusive catalyst for growth. Our analysis shows how DCPD operations confer a diverse and significant array of economic benefits across their host counties and the state economy generally. Using the latest and most detailed data available, combined with advanced economic impact assessment tools, it demonstrates how continued operation of DCPD will create hundreds of millions of dollars in additional income and support thousands of jobs outside the energy sector. Moreover, regardless of the status of prior DCPD targeted tax and prior fee arrangements, DCPD operations contribute (directly and indirectly) more than \$80 million in combined state and local taxes and over \$160 million in Federal taxes.

Logically, San Luis Obispo County has the most to gain from DCPD operations in relative terms, while Santa Barbara experiences qualitatively similar but smaller gains because its local direct income from DCPD is about 10% that of SLO. Having noted this, the state economy captures much larger benefits than the two counties combined because DCPD operations are intimately linked across PG&E's systemwide transmission and marketing services. The result is total economic benefits to the rest of the state are even larger than in SLO and SB combined, generating \$901 million in additional GSP and over 3,800 additional jobs. In other words, DCPD operations generate roughly \$3 of California income for every dollar of its own operating cost and over two additional FTE jobs for every one of its own production workers. Thus, DCPD is not only the largest single producer of clean power in California, but is a rich source of private and public income and opportunity.

4 Real Estate Market Assessment

Because it is a major local employer with relatively high wage workers, DCPD operations have important spillover effects on property values. For this reason, every significant economic assessment of DCPD operations has addressed the issue of real estate market effects. This section reviews the general issues involved and presents a more technical analysis to support generally positive conclusions regarding DCPD's contribution to sustaining property values, the core asset for most American households. The same forces also support provision of many public and private goods and services associated with higher value residential communities.

4.1 General Considerations

Specific evidence on the effect of the Diablo Canyon extension on the local real estate market is limited, partly because the market has been influenced by numerous factors, and the plant's operational extension was a preservation of the status quo rather than a significant new development. However, the economic stability created by the extension of operations has likely prevented the negative real estate impacts that were widely anticipated from the plant's prospective closure. Most of the available evidence points to four generic economic consequences of closing the plant, which were averted by the extension.

- **Preserved economic output and jobs:** A 2018 study commissioned by CPUC? found that closing the plant would have resulted in a significant reduction in San Luis Obispo (SLO) County's GDP and the loss of thousands of jobs, both at the plant and in related industries (citation needed). By extending the plant's life, this economic fallout was avoided.
- **Prevented reduction in local services and infrastructure:** Research from previous BEAR study anticipated that the closure would lead to a loss of tax revenue, which could have negatively impacted local infrastructure and public services. The continued operation of the plant has averted this fiscal shock, safeguarding the area's quality of life.
- **Reduced potential for market uncertainty:** In the years leading up to the expected closure, there was uncertainty about the future of the plant's employees, their housing needs, and the overall economic health of the region. By extending operations, this period of market uncertainty has been prolonged, preventing a potential dip in real estate values driven by speculation.

Impact of preserving high-wage employment

- **Stable housing demand:** Diablo Canyon is a major employer in the region, with its workers holding high-paying jobs in engineering, technical fields, and security. By preserving this employment, the extension supports the local housing market by maintaining a consistent pool of buyers and renters.
- **Support for related industries:** The plant and its workers support numerous other local businesses, including real estate agencies, home services, and retail. The continued presence of these high-wage jobs helps maintain the economic vitality of the region, which has a stabilizing effect on real estate values.
- **The real estate market in 2025 and other influencing factors:** It is important to note that the local real estate market is also influenced by broader economic factors, making it difficult to isolate the effects of the Diablo Canyon extension. For example, some sources indicate that the California Central Coast real estate market as a whole experienced a downturn in 2025 due to high interest rates, despite the stability provided by Diablo Canyon's continued operation (citation?). This suggests that while the extension prevents *negative* effects associated with closure, it doesn't insulate the market from larger regional or national trends.

4.2 Analysis

The impact of nuclear power plants on local real estate markets has long been a concern for communities. In general, there are two countervailing forces at play. On one hand, nuclear plants provide ample economic opportunity. As we have discussed, DCCPP employs nearly 1,500 employees and these jobs create spillover economic benefits throughout the region. This economic channel tends to increase housing demand and put upward pressure on property values.

On the other hand, perceived risk and stigma could present downward pressure on property values. For example, following the 2011 Fukushima accident, property markets near nuclear plants in Germany experienced declines (Bauer et al., 2017), highlighting the role of negative news and risk perceptions on real estate.

Empirical research on the net effect of nuclear plants is mixed, as these countervailing forces make isolating impacts difficult. Clear information shocks, such as Fukushima, tend

to produce measurable effects, while absent such shocks, impacts are often small or inconsistent. Results are also highly localized and timing specific.

DCPP is situated in a highly desirable, supply-constrained coastal California market, where housing demand consistently outpaces supply. In such a context, broader housing market dynamics likely dominate any effects from DCPP, suggesting that its overall impact on property values is limited compared to the economic and regulatory constraints on housing production.

In our previous analysis of the DCPP closure announcement, we found mixed results: one method indicated a small decrease in housing values, while another showed a small increase. These findings suggested that announcement effects were limited.

To further examine the relationship between DCPP and local housing prices, we conduct an econometric analysis of the decision to extend DCPP's operations. Our results indicate that this timing event did not significantly affect local housing values in the long run. While DCPP contributes to the regional economy, the local housing market appears robust and relatively insensitive to information shocks related to the plant.

2. Methods and Data

Our analysis utilizes the [Zillow Home Value Index](#) (ZHVI), a measure of the typical home value across a given region over time. The ZHVI is a calculated weighted average of the middle third of homes in a given region (35th to 65th percentile). Therefore, it is not a representation of the median home value but instead represents the “typical home value” for the region. We use the smoothed, seasonally adjusted ZHVI for all homes which includes single-family, condominium, and co-operative homes. The data are available at the ZIP code level with monthly measurements from January 2000 to July 2025. To align with our alternate dataset, we restrict the sample to observations from January 2012 through July 2025. Rural ZIP codes with limited housing data are not included.

Because the ZHVI is an estimated measure, we also consider median sale price obtained from [Redfin](#) as a robustness check. Instead of monthly observations this data is over a rolling 90-day period which accounts for monthly variation in home sale prices.²⁰ The observations are also available at the ZIP code level and cover the period from January 2012 to July 2025.

²⁰ 90 day or quarterly data is typical for housing markets. In smaller ZIP codes, there may only be a handful of home sales in a given month. A single unusually high (or low) sale can affect the monthly median dramatically. Housing markets also move slowly with contracts closing over several weeks. Aggregating over 90 days helps determine true values opposed to a noisy month.

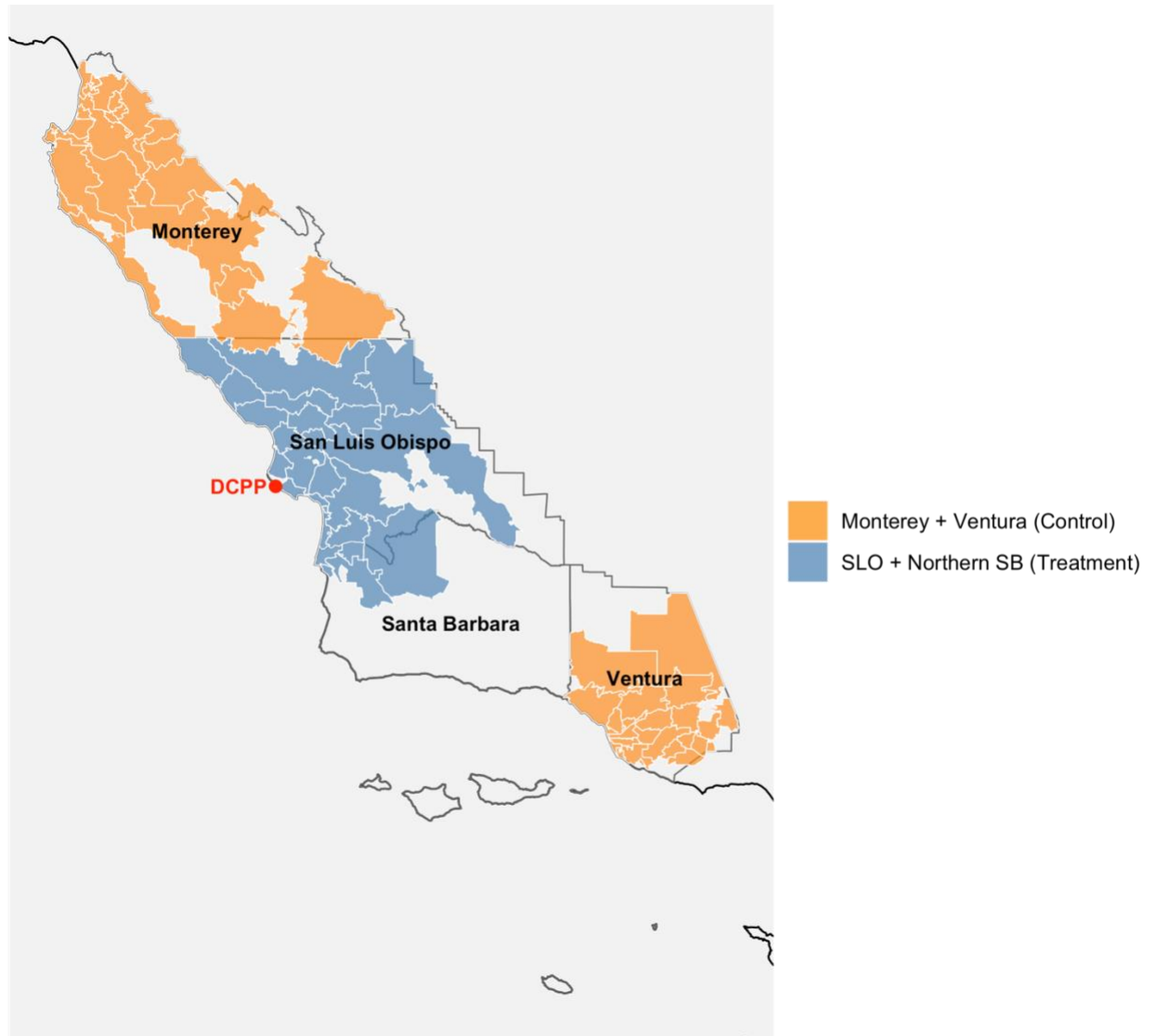
The primary question we are interested in answering is if the announcement that DCPD will continue operations will affect home prices in San Luis Obispo and northern Santa Barbara counties. To answer this question, we use two different econometric models that compare how the announcement effect impacts two similar but different geographic areas. Our model considers two geographic areas represented by ZIP codes and is displayed in Figure X below.

- **Treatment Group:** This group consists of ZIP codes in San Luis Obispo and selected Northern Santa Barbara Counties (primarily in Santa Maria). These are the areas that would plausibly be affected by the announcement that DCPD will continue operations.²¹
- **Control Group:** The ideal comparison group would be a set of ZIP codes that are similar to the San Luis Obispo and Northern Santa Barbara counties in every relevant way, except for the announcement that DCPD will continue operations. In other words, we want a market that would have followed the same market trends but was not exposed to the policy shock. Ventura and Monterey County were selected as the comparison group. These areas have geographic proximity, similar economic profiles, demographics, and housing markets.²²

²¹ San Luis Obispo and Northern Santa Barbara ZIP codes include: 93458, 93455, 93446, 93454, 93405, 93420, 93422, 93401, 93444, 93402, 93433, 93442, 93465, 93449, 93434, 93445, 93428, 93453, 93461, 93430, 93432, 93452, and 93424.

²² Monterey and Ventura ZIP codes include: 93033, 93065, 93906, 93905, 93030, 93063, 93003, 93036, 93010, 91320, 91360, 93021, 93012, 91362, 93060, 93955, 93001, 93940, 93004, 93901, 93035, 93960, 93907, 93933, 93023, 93041, 93908, 93927, 93015, 91361, 93930, 93923, 93950, 91377, 95012, 93926, 93022, 93924, 93451, 93953, 93066, 93920, 95039, 93426, 93925, 93040, 93932, and 93962

Figure 4.1: ZIP Codes included in Real Estate Analysis



With our two groups defined we must consider the relevant policy announcement that signals DCPD will extend operations. We use the signing of SB 846 on September 2, 2022, as the announcement date. We consider home values for both groups before and after September 2022 and see if there are differences between the groups.

To estimate that question we use two different econometric models. The first model, known as an event study, focuses on home values around the timing of the announcement. It lets us see if there was an immediate jump or decline, and how long the effect lasted after the announcement. The event study also is useful for demonstrating that our comparison group to San Luis Obispo and Northern Santa Barbara has similar real estate market dynamics.

The second model is known as a Difference-in-Difference (DiD) model. This model takes a longer view and compares changes across two dimensions. The first difference considers how prices changed in San Luis Obispo and Northern Santa Barbara counties before and after September 2022. The second difference considers how prices changed in Monterey and Ventura over the same period. If prices in San Luis Obispo and Northern Santa Barbara rose more (or fell less) than in Monterey and Ventura after September 2022, we can attribute that difference to the announcement effect that operations will continue. Both our models control for differences across ZIP codes and time that we cannot directly measure, allowing us to isolate the impact of the announcement more accurately.

4.3 Results

Statistical analysis of property market impacts proceeds in two ways. First, we example trend data to identify and correlated events linking DCPD announcements and prices in proximate real estate markets. A second, deeper analysis tests for the possible existence of causal relationships, between these variables. This would make a stronger case linking DCPD operations to property values, but it requires higher standard for evidence.

4.3.1 Trend Analysis

Before presenting the results from our econometric analysis we present trend lines that serve as a visual representation of home values from 2012 to 2025. Figure 4.2 below shows the ZHVI home values separated by different proximity groups to DCPD. Unlike most other nuclear facilities, we see that home values are most expensive closest to DCPD. This reflects the location of DCPD along the coast, and these distance bins reflect how home values decrease further from the coast. In regard to trends, we see a large increase in home values beginning after 2020 which signals the impact of the COVID-19 pandemic on real-estate prices in the region. The dashed line represents the timing announcement for DCPD to extend operations. Home values begin a steep decline just prior to the announcement. While this provides some support for an announcement effect, as we show in our next graph, this effect is not isolated to San Luis Obispo and Northern Santa Barbara.

Figure 4.2: San Luis Obispo and Northern Santa Barbara Home Values, 2012 - 2025

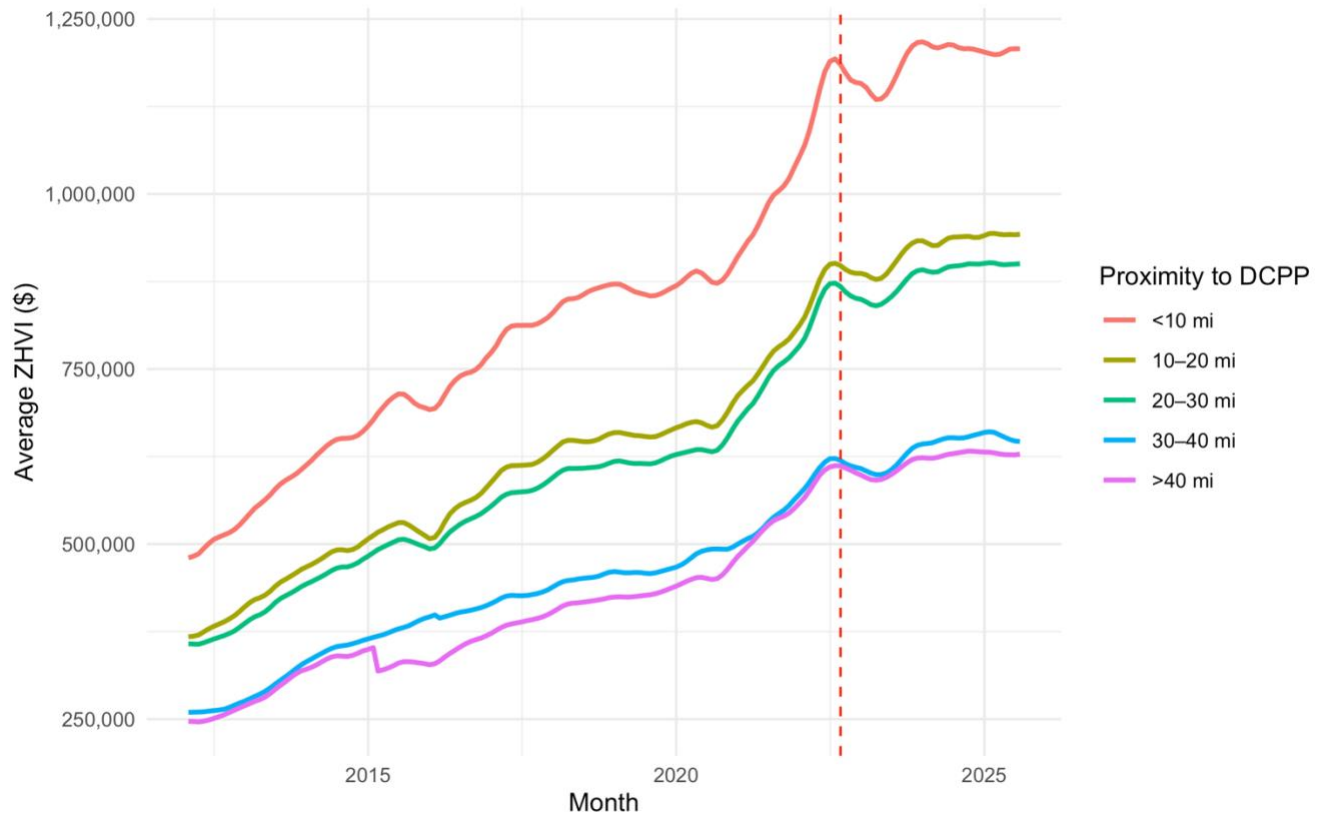
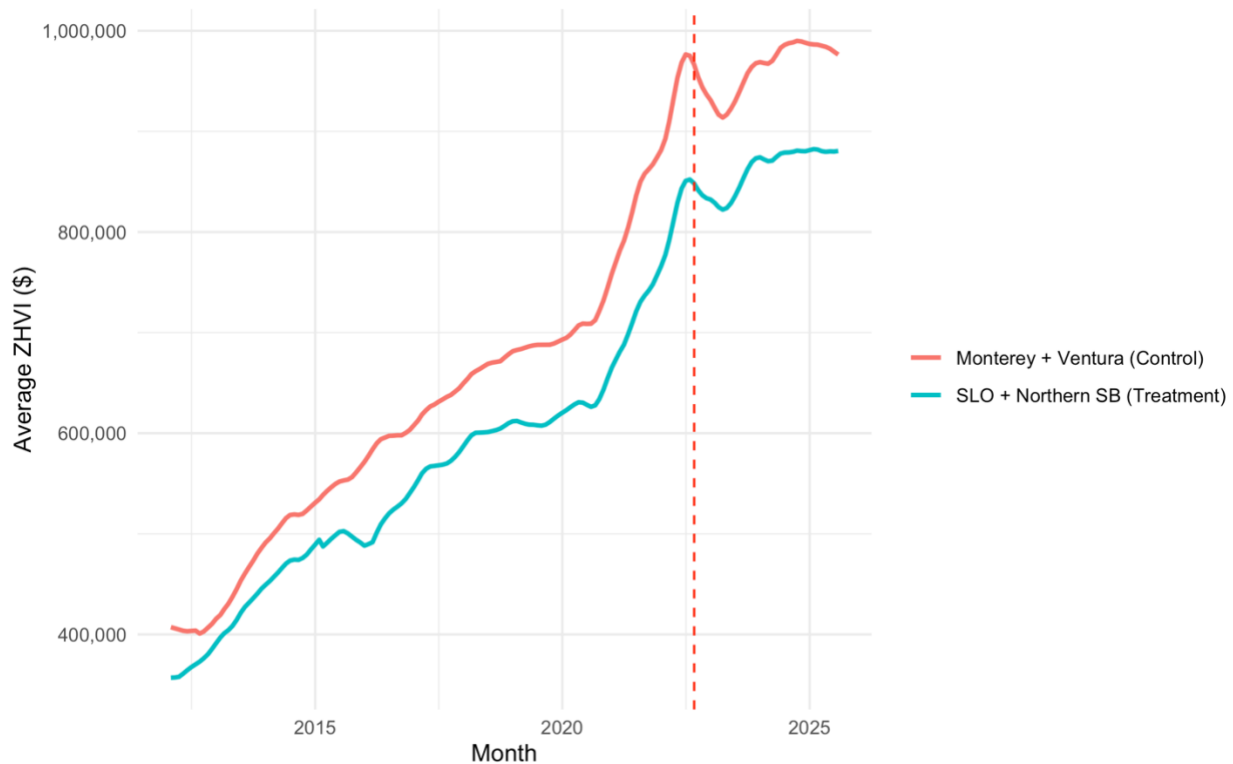


Figure 4.3 compares home values over this same period but now considers San Luis Obispo and Northern Santa Barbara to Monterey and Ventura. As we see in this figure, the same effect of declining home values is seen in our comparison group. The announcement effect should have no effect on Monterey and Ventura, and therefore this suggest something else is the cause of falling home values during this period. One likely explanation is that this was a period of rapidly rising interest rates. While these visual representations are useful to look at trends, they cannot answer how the announcement effect impacts home values. For that, we turn to the econometric analysis.

Figure 4.3: Home Values across San Luis Obispo, Northern Santa Barbara, Monterey, and Ventura, 2012 – 2025



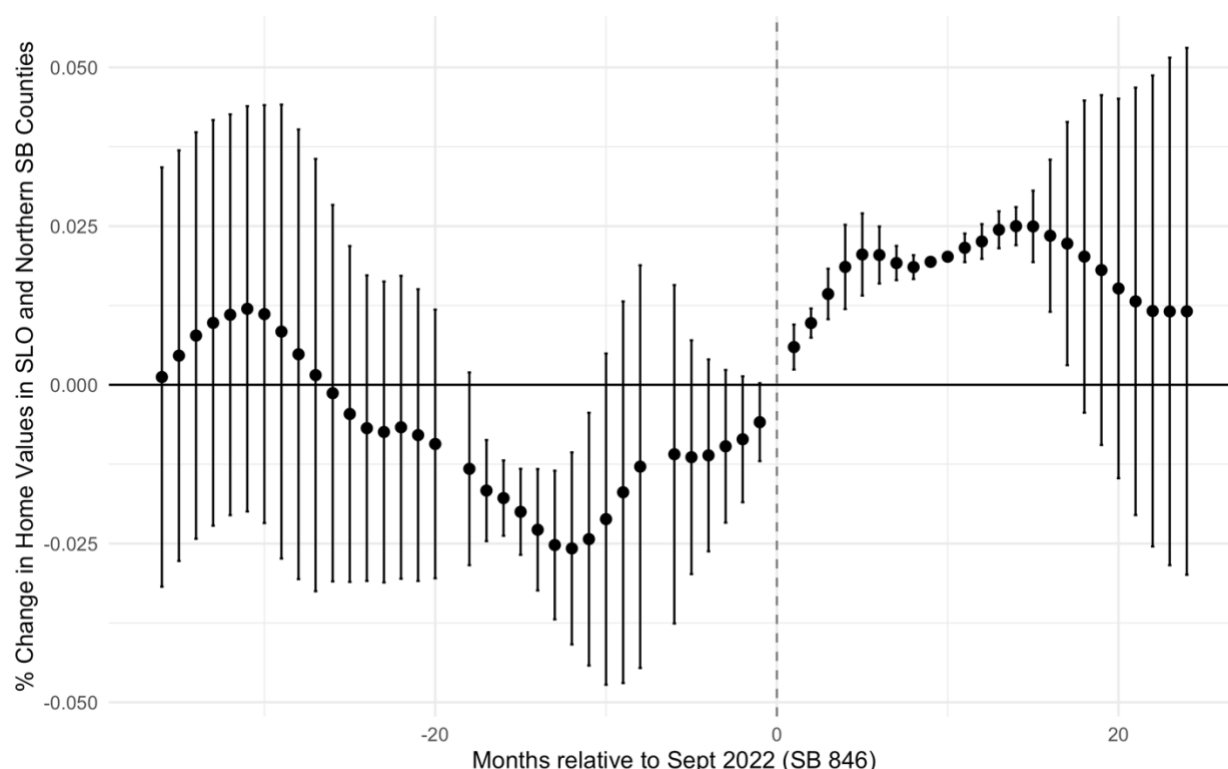
4.3.2 Event Study

The result from our event study analysis is presented below in Figure 4.4. The X-axis represents months relative to the September 2022 announcement. Each dot represents the estimated difference in home values between San Luis Obispo and Northern Santa Barbara and Monterey and Ventura for that relative month. The vertical dashed line is September 2022 which represents our baseline period which all other months are compared to. The horizontal line at 0 represents no announcement effect. In other words, if a dot is on this line, it means that home values in San Luis Obispo and Northern Santa Barbara did not behave differently in that month relative to those in Monterey and Ventura. Each dot has an error bar which represents the 95% confidence interval. This means if the bar crosses the horizontal line at 0 the effect is not statistically significant at conventional levels.

The event study demonstrates several things. First, we find support that San Luis Obispo and Northern Santa Barbara home values exhibit a parallel trend to those in Monterey and Ventura before the announcement. The dots hover around zero, and while there is some noise, the majority of results are not statistically significant. Second, immediately after the announcement, we find that home values in San Luis Obispo and Northern Santa

Barbara increased in value more than those in Monterey and Ventura. The magnitudes represent a roughly 1.5 – 2.5% and are statistically significant. Finally, in the longer run (~18 months) the effect appears to flatten and then dissipate. This suggests that the market may have absorbed the announcement with little persistent gap to the comparison group. Overall, the event study suggests a short-lived increase in home values in San Luis Obispo and Northern Santa Barbara from the announcement, before eventually tapering off.

Figure 4.4: Event Study Analysis



4.3.3 Difference-in-Difference

As a further robustness check we also consider a DiD model. This model is useful to determine if there was persistent long-run average effect. We also consider median home prices here as a further robustness check. We present the results from the model below in Table X. The row labeled treat x post is the primary result. The coefficient of 0.010 in the ZHVI column corresponds to a 1% increase in home values in San Luis Obispo and Northern Santa Barbara relative to our comparison group. We find a conflicting estimate with median sale price data showing a 2.1% decrease.

The number in parentheses is the standard error which measure how precise our estimate is. In this case, the standard errors are large relative to the estimated effects, meaning the results are imprecise. Consequently, the estimates are not statistically significant, and we cannot rule out the possibility that the true effect is zero.

Taken together, the estimated treatment effects are small in magnitude, conflicting in sign, and statistically insignificant. We therefore do not find consistent evidence that the announcement effect had a measurable lasting impact on housing prices.

Table 4.1: Results from Difference-in-Difference Model

Variable	ZHVI	Median Sale Price
treat × post	0.010	-0.021
	(0.031)	(0.049)
Number Observations	11417	3752
Standard Errors	by county	by county
FE: ZIP	X	X
FE: Month/Quarter	X	X

p < 0.05, ** p < 0.01, * p < 0.001*

4.4 Conclusion

While the event study suggests a short-lived increase in home values in San Luis Obispo and Northern Santa Barbara following the SB 846 announcement, these effects taper off within 18 months. This is consistent with the DiD results, which finds no statistically significant long-run average effect of the announcement on local housing values. These effects overall are consistent with prior research that finds property value impacts from nuclear plants vary depending on local housing market conditions. In weaker housing markets, concerns about nuclear facilities can depress values, but in high-demand locations, housing scarcity may outweigh such concerns. San Luis Obispo and the surrounding coastal California areas represent one of the most desirable real estate markets in the country, suggesting that the premium attached to living in this area likely dominates any potential stigma associated with DCP. In addition, the plant provides stable employment and local economic activity, which could further offset negative perceptions. Taken together, the evidence indicates that DCP's continued operation has not had a discernible impact on local housing values.

These findings are not surprising considering the chronic housing shortage in San Luis Obispo and surrounding counties. The most recent Regional Housing Needs Allocation

(RHNA) process highlights that the area is underbuilt relative to demand. Over the current cycle (2019 – 2028) the RHNA calls for 10,810 additional units needed across various jurisdictions. Housing production has not kept pace with these goals especially for low- to moderate-income levels. This persistent supply-demand imbalance means that local housing prices are primarily driven by the scarcity of homes and high desirability of California coastal living. In such a tight market, even a large, higher income employer will have limited cyclical impacts on average home values. Having noted this, DCPD land use and other targeted local investment decisions can influence more specific conditions. These topics are touched upon in an “extensions” section of this report, but the main conclusion of this analysis is that DCPD is an anchor for sustaining high local living standards in SLO and neighboring counties.

5 Bond Market Assessment

Among the many potential economic impacts of the prospective DCPD closure, one of the most scrutinized was its fiscal implications for the various government institutions of San Luis Obispo County. When economic sentiment about a regional economy turns negative, bond markets react by pricing higher anticipated risk into bond rates. In some cases, the effects of this on overall public budgets can be greater than the loss of individual revenue sources. Because the cost of capital affects the entire budget of local public entities, these “second order” risk effects are potentially as significant as the direct, indirect, and induced revenue impacts of the DCPD closure. Conversely, the continued operation of a large and economically robust, high income employer can improve investor sentiment and lower bond rates in local markets.

5.1 Approach

If the property and unitary taxes from DCPD are considered significant by the bond market, we would expect to see increased interest rates for affected municipalities (e.g. San Luis Obispo County, the City of San Luis Obispo, San Luis Coastal Unified SD, etc.). Interviews in September 2018 of representatives from San Luis Obispo County and the City of San Luis Obispo elicited responses that their respected bond managers were somewhat worried about the effect of the public revenue loss on financing. Bond rating downgrades of relevant municipal bonds matched this assessment.

However, if the bond market anticipates other sources of revenue for municipalities, we may not see higher bond rates. It may be the case that PG&E’s relatively large total contribution to the local economy lowers perceived local risk and thereby the cost of public capital.

In order to fully understand the potential fiscal effects on SLO County and surrounding municipalities, we apply econometric tools to study publicly available bond trade data. We use the event study framework, a common tool for financial economics, to study market indicators of an increasing cost to capital. The framework allows us to measure changes in public risk perception (through changes in bond yield rates) around a clearly defined event date (i.e., the DCPD closure announcement that occurred on June 21, 2016)²³ and compare compared to what would have been expected in absence of the event.

23

See [https://www.abc10.com/article/news/pge-agrees-to-close-diablo-canyon-in-2025/103-251255116#:~:text=Author:%20Associated%20Press%20and%20Staff%20\(ABC%2010,Updated:%208:07%20AM%20PDT%20June%2021%2C%202016](https://www.abc10.com/article/news/pge-agrees-to-close-diablo-canyon-in-2025/103-251255116#:~:text=Author:%20Associated%20Press%20and%20Staff%20(ABC%2010,Updated:%208:07%20AM%20PDT%20June%2021%2C%202016) .

5.2 Data

To study this event, we utilize public trade data from the Municipal Securities Rulemaking Board (MSRB)'s Electronic Municipal Market Access (EMMA) website, the official source for municipal bond data.²⁴ EMMA provides data on every individual trade made on a bond issued by a particular municipality. We use EMMA to collect data from the following bond issuers within SLO County:

- City of San Luis Obispo
- Paso Robles Joint Unified School District
- San Luis Coastal Unified School District
- San Luis Obispo County

We also collect bond trade data from nearby municipalities whose tax revenue is not directly affected by the closure of the DCP, which will be used later as points of comparison, specifically:

- Santa Barbara County
- Monterey County

Many issuers have several bonds available (for example, the [City of San Luis Obispo](#) has 24 different bonds covering a wide range of purposes including public safety, water infrastructure, and parking). For each issuer, we collect 6 months of data on all bonds traded three months prior to the announcement of the closure and the three months following the announcement. This time period allows us to get a sense of any trends in bond yields before and after the announcement, while still focusing on the immediate effects of the event itself.

²⁴ <https://emma.msrb.org/>

Figure 5.8: Geographic coverage of relevant bond issuers within SLO County for event study

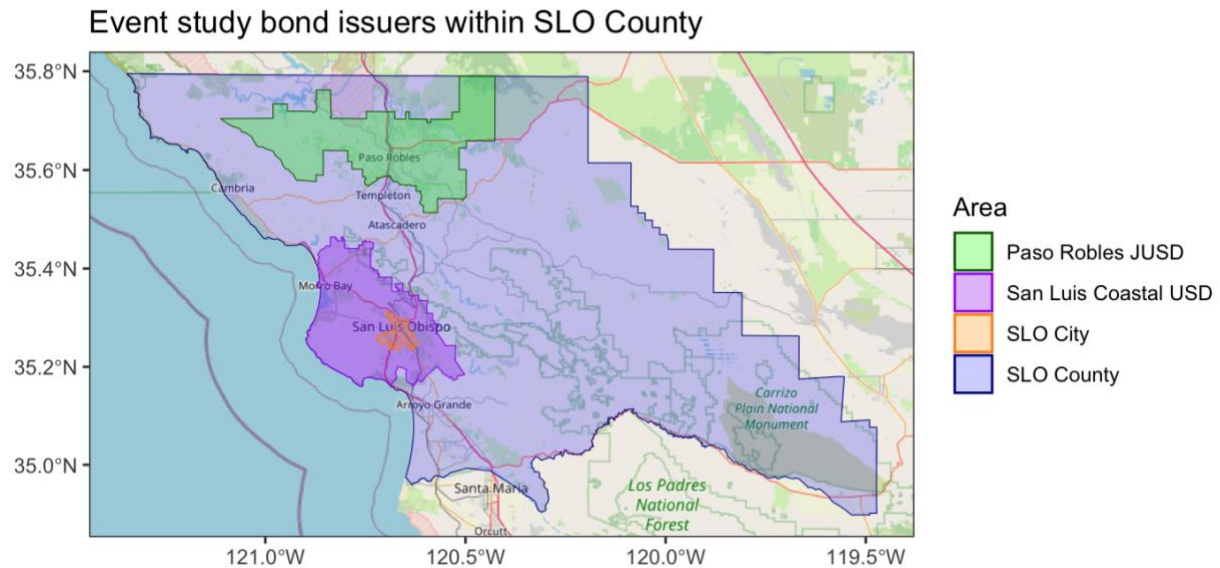
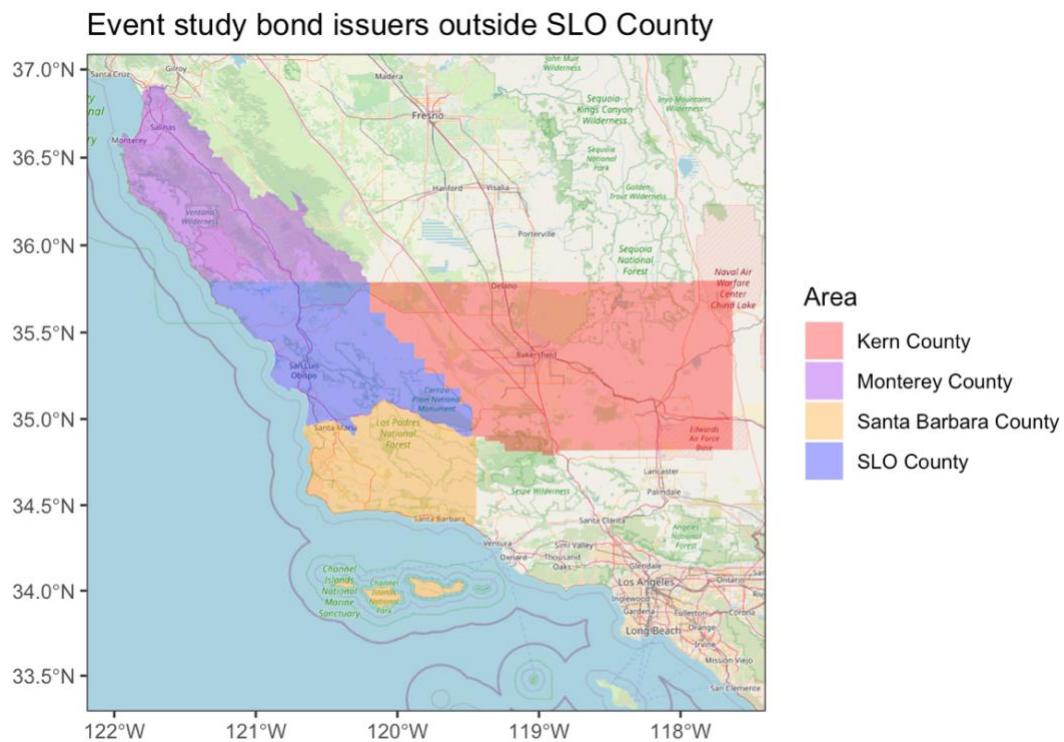


Figure 5.2: Event study, using surrounding counties for comparison



Because a bond's yield rate over time is affected by the broader economy and also the bond's time to maturity, we must use an appropriate benchmark to normalize yield values for accurate comparison. To do so, we utilize the US Treasury's [Daily Par Yield Curve Rates](#) which provides discrete rates from 1 month to 30 years of maturity, which allows us to match each traded bond with a precise rate based on the date of trade and its remaining Time to Maturity. By calculating [Bond Yield %] – [Treasury Curve Yield %] we obtain what's known as a Yield Spread. This can be interpreted as the extra yield (and risk) the bond provides compared to a risk-free alternative with the same remaining time to maturity.

5.3 Methodology

We first show descriptive, correlational evidence by calculating the average yield spread before and after the announcement.²⁵ To obtain causal evidence on the effect of PG&E's withdrawal, we utilize a difference-in-differences model. This econometric method allows us to understand how bonds issuers within San Luis Obispo County which are directly affected by the announcement compare against similar, yet unaffected bond issuers outside SLO County. In this case, the three counties that border San Luis Obispo – Kern County, Santa Barbara County, and Monterey County – serve as the unaffected municipalities for comparison. By looking at the difference in the differences between the two groups over time, we can isolate the effect of the event itself from other background trends which would affect all bond issuers.

While the model's variable of interest is the bond yield spread for bond issuers of interest, we also incorporate other important control variables. We include data that accounts for demographic heterogeneities such as income within the county/school district/city, spatial variables (distance to DCP, travel time to DCP), and variables related to bond trading characteristics (volume, date of trade).²⁶

²⁵ We use regression specification $YieldSpread_{it} = \beta^0 + \beta^1(PostEvent_t) + \gamma(Controls_{it}) + \varepsilon_{it}$

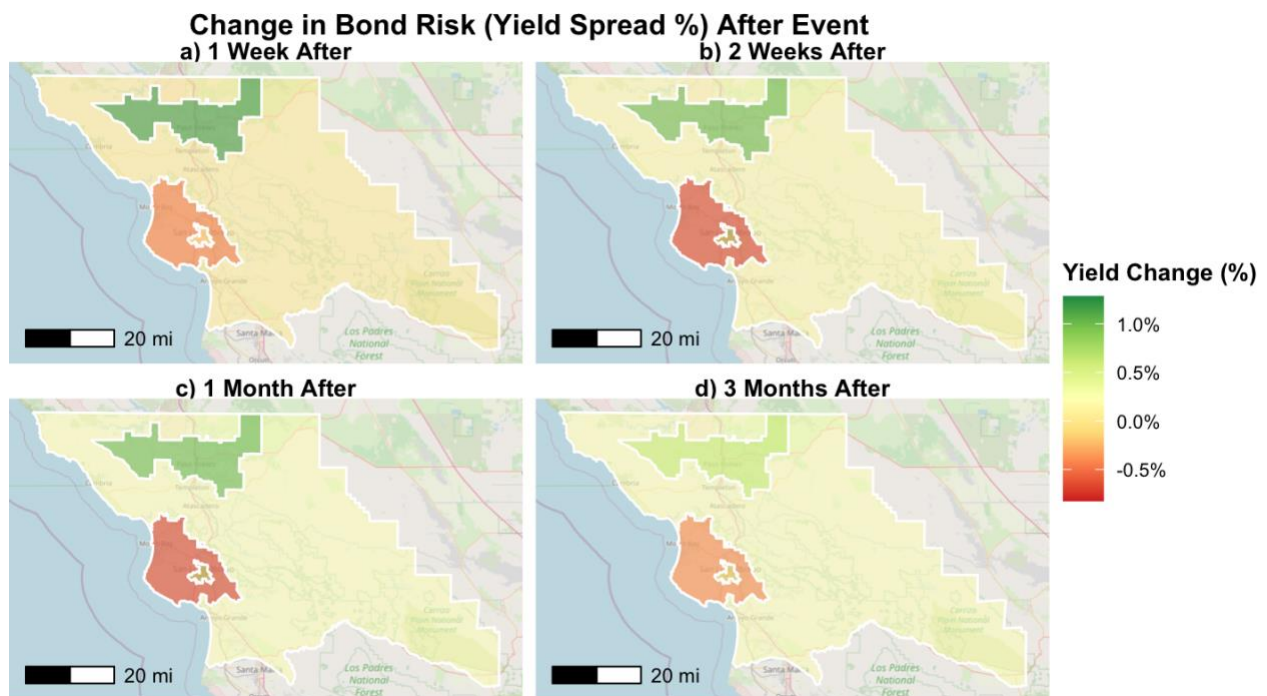
²⁶ We use the following specification for our difference-in-differences model:

$$YieldSpread_{it} = \beta_0 + \beta_1(Treated_i) + \beta_2(PostEvent_t) + \beta_3(Treated_i \times PostEvent_t) + \gamma(Controls_{it}) + \varepsilon_{it}$$

5.4 Results

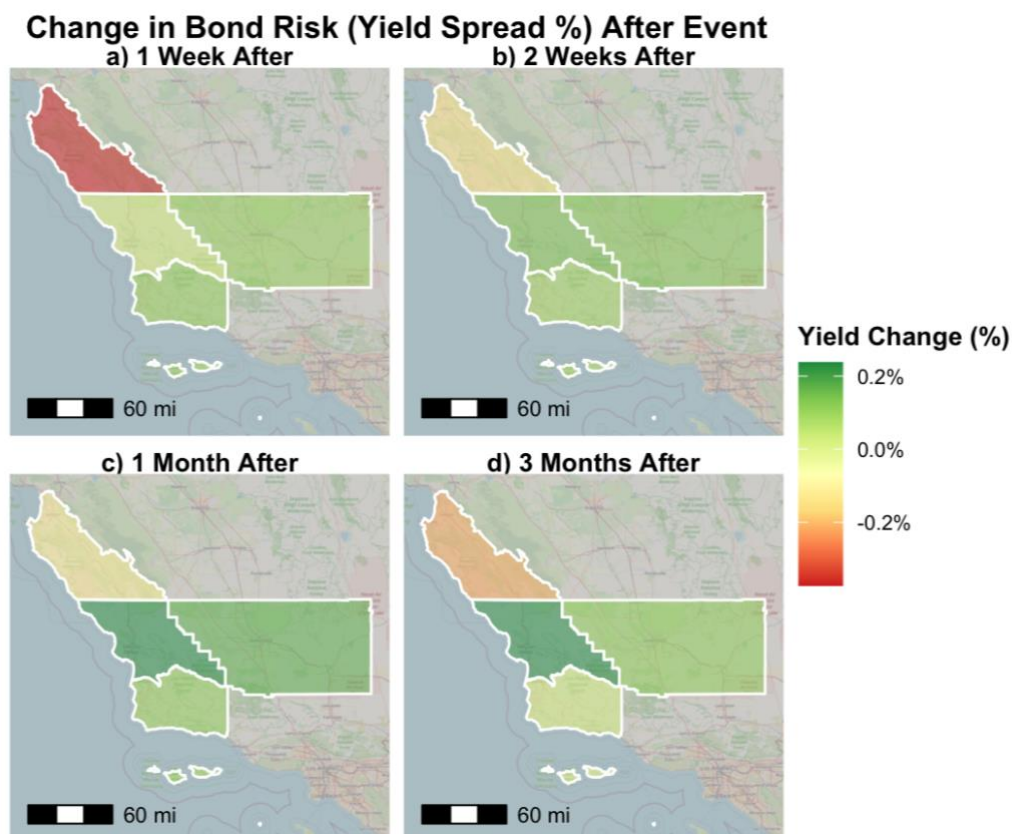
Following announcement, the average bond yield increased in the following weeks for bond issuers in SLO County (see Figure 5.3). This increase in bond yield means that the market believed there was increased risk for bonds issued by SLO County, City of SLO, and Paso Robles Joint Unified School District. While this finding suggests a relationship, it is not definitive proof of cause and effect. It's possible that a separate, unrelated economic events happened at the same time, and these other events are the true driver of the change in yields. A simple before-and-after comparison cannot rule out such alternative explanations.

Figure 5.3: Change in bond risks within SLO County, as measured by bond yield spread



And indeed, we observe a general increase in yield spread when we look at counties not directly affected by event announcement (see Figure 5.4). Thus, in order to determine whether there was an additional increase for bonds within SLO County, relative to the comparison counties which should be relatively unaffected by this announcement, it is important to use the difference-in-differences technique mentioned previously.

Figure 5.4: Change in bond risk outside SLO County, as measured by bond yield spread



Utilizing the difference-in-differences model described above, we find causal evidence that following the closure announcement, yield spread of bonds in SLO County increased 0.26 percentage points (26 basis points) more than bonds issued by comparable counties.²⁷ This provides strong evidence that the market believed that SLO County showed increased risk following PG&E's announcement to shut down DCP. This result is consistent and remains statistically significant even when we use different combinations of controls variables.

²⁷ We include controls for income, county, distance, trade time, and trade volume. P-value = 0.001, which is very statistically significant

While a 0.26 percentage point increase in bond yield may seem like a very modest increase, it has significant implications for the county's finances. As of 2024, San Luis Obispo County has a bond debt of \$396.3 million.²⁸ A persistent 0.26 percentage point increase would equal \$396.3 million * 0.0026 = \$1.03 million additional, *per year*. Assuming a 20 year bond maturity, that would be over \$20 million dollars spent due to higher borrowing costs from increased bond risk.

Note that this \$396.3 million figure does not cover school district bond debt, such as Measure C-22, which was passed in November 2022 and allocates \$349 million dollars for school facilities in San Luis Coastal Unified School District²⁹. A persistent .26 percentage point increase would equal \$349M * 0.0026 = \$0.91 million dollars of extra payment annually. Over a 20 year period, this would amount to over \$18 million dollars in additional debt payment due to increased bond risk.

Table 5.6: Bond Debt for SLO County (2024)³⁰

Bond Type	\$ (in thousands)
Certificates of Participation	8,525
Pension Obligation Bonds	72,966
Lease Revenue Bonds	94,668
Revenue Bonds	146,726
General Obligation Bonds	5,321
Assessment Bonds	68,091
Total	396,297

In conclusion, a small bond yield increase like the one estimated in our model could ultimately cost the County and its school districts tens of millions per year. To cover a \$20 million shortfall on existing debt (\$38 million, including school district debt) over the next two decades without cutting any services, the burden would ultimately fall to taxpayers through future rate hikes or new fees. This demonstrates how PG&E's current presence

²⁸ <https://www.slocounty.ca.gov/departments/auditor-controller-treasurer-tax-collector-public/forms-documents/financial-reports/annual-comprehensive-financial-report/2023-24-slo-county-acfr>, pg. 33

²⁹ <https://www.slcsd.org/about/measure-c>

³⁰ <https://www.slocounty.ca.gov/departments/auditor-controller-treasurer-tax-collector-public/forms-documents/financial-reports/annual-comprehensive-financial-report/2023-24-slo-county-acfr>, pg. 33

direct and long-lasting consequences for a community's wallet and the quality of its public services through keeping the cost of borrowing low.

5.5 Conclusion

This study quantifies the financial impact of PG&E's presence in San Luis Obispo (SLO) County by analyzing the bond market's reaction to the 2016 Diablo Canyon Power Plant closure announcement. Using a difference-in-differences model, the research found that the announcement caused SLO County's bond yield spread to increase by 0.26 percentage points (26 basis points) compared to similar counties, signaling that investors perceived greater risk.

This seemingly small increase has significant long-term financial consequences for the community. On the county's bonds alone, the higher yield translates to an additional \$1.03 million in annual interest payments, while school district bonds, such as those for San Luis Coastal, would face an extra \$910,000 in costs per year.

The study demonstrates that PG&E's presence in the county provides a substantial financial benefit by keeping borrowing costs low. The closure announcement revealed that the company's departure would cost local taxpayers millions annually, either through reduced public services or future tax and fee increases.

6 Conclusions of the Economic Impact Assessment

This economic impact assessment makes two primary contributions to strategic planning, public and private information, and constructive energy policy dialog. The first of these is informational - a general summary of economic issues related to extension DCPD operations. This occupies much of the narrative background in this report. The second contribution is technical - a rigorous analysis of three main dimensions of DCPD impact on the local and state economies. The findings of the technical analysis are summarized here.

6.1 Economic Impact Assessment

Generally, this economic impact assessment finds that DCPD operations are a potent and inclusive catalyst for growth. Our analysis shows how DCPD operations confer and diverse and significant array of economic benefits across their host counties and the state economy generally. Using the latest and most detailed data available, combined with advanced economic impact assessment tools, it demonstrates how continued operation of DCPD will create hundreds of millions of dollars in additional income and support thousands of jobs outside the energy sector. Moreover, regardless of the status of prior DCPD targeted tax and prior fee arrangements, DCPD operations contribute (directly and indirectly) more than \$80 million in combined state and local taxes and over \$160 million in Federal taxes.

Logically, San Luis Obispo County has the most to gain from DCPD operations in relative terms, while Santa Barbara experiences qualitatively similar but smaller gains because its local direct income from DCPD is about 10% that of SLO. Having noted this, the state economy captures much larger benefits than the two counties combined because DCPD operations are intimately linked across PG&E's systemwide transmission and marketing services. The result is total economic benefits to the rest of the state are even larger than in SLO and SB combined, generating \$901 million in additional GSP and over 3,800 additional jobs. In other words, DCPD operations generate roughly \$3 of California income for every dollar of its own operating cost and over two additional FTE jobs for every one of its own production workers. Thus DCPD is not only the largest single producer of clean power in California, it is a rich source of private and public income and opportunity.

6.2 Real Estate Market Assessment

Because it is a major local employer with relatively high wage workers, DCPD operations have important spillover effects on property values. For this reason, every significant economic assessment of DCPD operations has addressed the issue of real estate market

effects. This section reviews the general issues involved and presents a more technical analysis to support generally positive conclusions regarding DCP's contribution to sustaining property values, the core asset for most American households. The same forces also support provision of many public and private goods and services associated with higher value residential communities.

Our initial econometric analysis found a short-lived increase in home values in San Luis Obispo and Northern Santa Barbara following the SB 846 announcement, and these effects taper off within 18 months. This is consistent with a second, more rigorous analysis that finds no statistically significant long-run average effect of the announcement on local housing values. These effects overall are consistent with prior research that finds property value impacts from nuclear plants vary depending on local housing market conditions. In weaker housing markets, concerns about nuclear facilities can depress values, but in high-demand locations, housing scarcity may outweigh such concerns. San Luis Obispo and the surrounding coastal California areas represent one of the most desirable real estate markets in the country, suggesting that the premium attached to living in this area likely dominates any potential stigma associated with DCP. In addition, the plant provides stable employment and local economic activity, which could further offset negative perceptions. Taken together, the evidence indicates that DCP's continued operation has not had a discernible impact on local housing values.

6.3 Bond Market Assessment

Among the many potential economic impacts of the prospective DCP closure, one of the most scrutinized was its fiscal implications for the various government institutions of San Luis Obispo County. When economic sentiment about a regional economy turns negative, bond markets react by pricing higher anticipated risk into bond rates. In some cases, the effects of this on overall public budgets can be greater than the loss of individual revenue sources. Because the cost of capital affects the entire budget of local public entities, these "second order" risk effects are potentially as significant as the direct, indirect, and induced revenue impacts of the DCP closure. Conversely, the continued operation of a large and economically robust, high income employer can improve investor sentiment and lower bond rates in local markets.

Our rigorous statistical analysis study finds that the DCP closure announcement led to a measurable increase in the perceived fiscal risk for municipal issuers in San Luis Obispo County, translating to an estimated 24-basis-point increase in their cost of capital. While this effect is statistically significant, the magnitude is modest. The market appears to have priced in a specific, county-level risk premium rather than a geographically widespread shock. These findings suggest that while the closure announcement was not completely fiscally neutral, the market did not anticipate a significant deterioration in the region's

credit quality at the time of the announcement. Conversely, our results suggest that extending operations will continue to support a favorable local investment climate, with competitive public capital costs and strong balance sheets.

7 Recommendations

In this study to assess local economic impacts of DCP, different analytical approaches yielded diverse insights about economic costs and benefits. Taking the results of this study together, DCP operations appear to present more opportunities than challenges. Overall economic impacts of operations are consistently and inclusively positive. The local economy's capacity to leverage the DCP opportunity will depend on community adaptability, cohesion, and foresight. In this section, we distill some general insights about how to capture more economic benefit from prior investments and existing, existing commitment, and improve public awareness. With proactive and coordinated strategies, we believe that SLO can leverage the gains from extending DCP services for more inclusive and sustainable prosperity.

7.1.1 Recommendations for Civil Society

As in most democratic societies, overall economic progress in SLO is the summation of individual effort and aspiration on the part of all its enterprises and households. When communities are presented with significant opportunities, however, individualism can be less effective than cooperation. The present findings about economic benefits of DCP operations can be immediately generalized to other innovation based, higher skill industries, but the community's ability to attract such investors depends on their own commitments to workforce development and improving the investment climate. SLO's diversity is an asset with great potential to advance diversified economic growth, but only if social barriers and demographic segmentation can be overcome. This will require more determined commitments to community dialog, enlisting a broad alliance of traditional community, faith-based, and educational institutions as well as NGOs and issue-oriented advocacy groups.

7.1.2 Recommendations for Local Governments

Promote constructive policy dialog on local economic development strategy and communicate this to public and private stakeholders at all levels. The example of DCP's local growth agency reminds everyone that opportunities must be pursued with local determination to diversify the economy and attract new businesses, particularly ones that support an innovation oriented, high-skill labor force. California's superior growth for at least two generations has been fueled by knowledge-intensive industries. SLO can do more to fulfilled its potential to participate in this dynamic.

Facilitate more affordable housing development with significant reductions of impact fees and permitting delays. The incidence of such costs falls largely on the developers and renters of new construction, disincentivizing both the construction and immigration of new and younger renter households. For a point of comparison, the parks development mitigation fee for a new single-family development in San Luis Obispo is \$3,251.83, whereas the corresponding fee in neighboring Santa Barbara is only \$1,371. More generally, a 750 sq. ft. single family home with one rush-hour commuter would cost \$26,485.02 in development impact fees in San Luis Obispo while the same development would cost \$4,162.50 in development impact fees in Santa Barbara, which is nearly 85% less.

Redouble enterprise development efforts and effectively coordinating these across jurisdictions. San Luis Obispo benefits from being a desirable place to live, the location of a quality public university, and ready access to the venture capital centers of Silicon Valley and Los Angeles. One way of leveraging this is through the support and development of startup accelerators, incubators, and other such “startup community” programs. Startup accelerators have been shown to not only improve regional financing environments for accelerated startups, but also have spillover effects due to increased interest from investors. Cal Poly’s Center for Innovation & Entrepreneurship already operates the Hot House Accelerator and Incubator in downtown San Luis Obispo.

Give higher priority to Public Private Partnerships (PPP) with local educational and technology institutions. Cal Poly SLO is fantastic resource for innovation in the regional economy. The Cal Poly Office of Research and Economic Development currently operates a technology transfer program mainly related to the patenting of new technologies and the licensing of those patents. This can be expanded in partnership with local government to provide not only patent aid but also, for example, legal and incorporation aid for small businesses or even tax incentives for startups to establish themselves long-term in the region. One possible model for this is the UC San Diego Office of Innovation and Commercialization, a well-known example of successful technology transfer to the local economy.

Commit to complementary local investments and institutional development to achieve more inclusive gains from DCPD operations. These initiatives should include public and private capacity development, financial and fiscal consideration for local enterprises, and enhanced labor force development programs.

To give one example, an often-overlooked, but nonetheless-important, work barrier is childcare access and affordability. Younger workers are disinclined to move into or settle in a region in which affordable and good-quality childcare is scarce. Recent reporting has indicated that the San Luis Obispo region has a significant issue with providing quality

childcare to its workers. California is in the final stages of implementing its Universal Prekindergarten (UPK) initiative, which aims to provide free, high-quality early education to all four-year-olds by the start of the 2025–26 school year. The state launched the program in 2021 as a "mixed delivery" system, combining several programs to increase access and choice for families. SLO should set an example of leadership for this program.

7.1.3 Recommendations for the State of California

Cooperate with local governments and PG&E to expand strategic perspective in ways that accommodate expanding private sector interest in nuclear power and recognize emerging uncertainties regarding capacity to expand renewables to keep pace with unprecedented electric power demand growth.

Work with local governments, related state agencies, and private investors to facilitate diversification of DCPD investments, resource use policies, and partnerships that build in DCPD's experience for innovation and sustained technology development. An excellent example of this is the now-stalled Bureau of Ocean Energy Management (BOEM) initiative, which has sharply focused attention on the importance of DCPD as a clean energy backstop. While California officials have affirmed their commitment to building offshore wind infrastructure despite federal setbacks, the BOEM delays mean that Diablo Canyon's importance as a reliable, zero-carbon power source will only increase in the near term. The state's energy security is now even more closely tied to the plant's continued safe and reliable operation.

7.1.4 Recommendations for PG&E

Our assessment results suggest there is significant uncertainty in the SLO community regarding economic (particularly fiscal) impacts, and that this uncertainty appears to engender pessimism and feelings of economic vulnerability. PG&E could expand its communication strategy to mitigate these sentiments. It would be beneficial for the public to more completely understand the opportunities presented by closure and its attendant investments. This study makes an effort to elucidate these benefits, but PG&E can speak with greater authority by reaffirming them, particularly regarding the extent to which economic stimulus will be localized and extended across stakeholder groups.

8 Extensions of the Present Analysis

8.1 Extended Energy Services

8.1.1 Storage

Although it is not intermittent, nuclear power currently has the lowest average cost of any major source and could be diverted to higher average cost loads and time periods. It can also offer a backstop to intermittent renewables that might make stored nuclear power an attractive alternative to natural gas fired Peaker plants. The brief comparison below suggests this extension could merit further consideration.

1. Capital Costs

- **Natural Gas Peaker Plants:**
 - The capital cost for constructing natural gas Peaker plants typically ranges from **\$800 to \$1,200 per kW** installed, depending on location, design, and regulatory factors. The total installation cost then can vary, but for a typical peaker plant, it might reflect higher due to infrastructure needs and regulations.
- **Battery Energy Storage Systems (BESS):**
 - Modern utility-scale lithium-ion battery storage systems generally cost about **\$300 to \$600 per kWh** for installed systems. For larger installations (like 100 MW systems), the total cost can reach between **\$3 million to \$5 million per MW**.

2. Operational Costs

- **Natural Gas Peaker Plants:**
 - Operational and maintenance costs for natural gas plants are usually around **\$10 to \$20 per MWh** produced. This includes fuel costs, which can fluctuate based on market prices.
 - **Fuel Costs:** Natural gas prices can vary but average around **\$3 to \$6 per MMBtu**, affecting overall operational economics depending on local supply.
- **Battery Energy Storage Systems:**
 - Battery storage systems have low operational costs, typically around **\$5 to \$10 per MWh**, with minimal regular maintenance needs.

- Battery degradation over time must also be considered, with modern lithium-ion batteries generally providing warranties for about **10 years** or **2,500 to 5,000 charge cycles** before their capacity significantly decreases.

3. Efficiency

- **Natural Gas Peaker Plants** - Typically, Peaker plants have thermal efficiencies ranging from **30% to 50%**, depending on the technology and design specifics.
- **Battery Energy Storage Systems** - Lithium-ion batteries have round-trip efficiencies of about **85% to 95%**, meaning most of the energy stored can be retrieved effectively.

4. Operational Lifespan

- **Natural Gas Peaker Plants** - These plants can operate for **30 years or more** with correct maintenance and periodic upgrades.
- **Battery Energy Storage Systems** - The effective lifespan of battery systems can vary. With proper management, lithium-ion batteries may have effective service lives of **10-20 years**, influenced by usage patterns and technological advancements.

5. Environmental Impact

- **Natural Gas Peaker Plants** - While cleaner than coal, natural gas facilities still produce greenhouse gas emissions during operation and have environmental impacts related to natural gas extraction.
- **Battery Energy Storage Systems** - Battery systems have a lower environmental impact during operation (zero emissions) but involve considerations related to mining lithium and other materials needed for batteries, as well as recycling challenges at end-of-life.

Conclusion

In summary, both natural gas Peaker plants and battery storage systems have advantages and disadvantages regarding cost, operational efficiency, and environmental impact:

- **Natural Gas Peaker Plants** are generally better for longer-duration energy provision and can provide power during peak times but have higher operational costs and environmental implications.
- **Battery Energy Storage Systems** provide efficient energy storage with lower ongoing costs and zero emissions during operation, but their effective lifespan and high capital investment need to be considered.

8.1.2 Investing in Storage for Supply Shifting and Rate Arbitrage

California is presently curtailing a significant amount of renewable (mainly solar) energy because of excess capacity in peak daytime production hours, but is also heavily reliant on imported energy during peak demand in the evenings. Investing in DCPD storage capacity of any kind could permit PG&E to improve distributional efficiency by shifting its very stable in-state nuclear supply to peak demand periods, moderating peak load rates and reducing wasteful curtailment. Benefits to rate payers, the state, and the utility could all be substantial.

8.2 Complementary Local Services

Continuation of DCPD operations opens the possibility of strategic planning to develop complementary local enterprise and institutional services in and around the facility. A few of the many possible examples are listed here.

8.2.1 Research Park

What is the potential impact of investing in a local research park to that hosts complementary technology developers and service providers?

8.2.2 Initiatives for Regional Cross Support and Technology Sharing

What are the opportunities for DCPD to support planning and capacity building in cooperation with new nuclear energy facilities across the Western U.S.? Clearly, these are expected to proliferate on a variety of scales, and DCPD's experience and leadership in this technology could be valuable resource for the sector.

8.3 Resource Services

DCPD is blessed with a large operating site set in a diverse natural California coastal landscape and surrounded by a thriving regional economy. These features suggest many pathways of development opportunity.

8.3.1 Land Use

Long-term land use plans for the Diablo Canyon site beyond 2030 are currently uncertain and depend on the outcome of PG&E's application to extend the plant's operating license through 2044 and 2045. The site's fate is a point of conflict between energy policy, conservation goals, and historical land claims.

Option 1: Plant operations extend through 2044/2045

PG&E formally applied to the Nuclear Regulatory Commission (NRC) in late 2023 for a 20-year license renewal. If approved, long-term land use for the 12,000-acre site would likely remain focused on supporting nuclear power generation for an additional two decades.

- **Grid reliability:** Continued operation would support California's electric grid stability and decarbonization goals, with the plant supplying up to 10% of the state's electricity and nearly 20% of its carbon-free energy.
- **Minimal land-use changes:** The current use of the surrounding property—a mix of conservation, agriculture (grazing), and public recreation via access trails—would likely continue without major changes for the foreseeable future.
- **Potential for desalination and hydrogen:** A 2021 study by MIT and Stanford suggested the plant could be used as a "polygeneration facility" to produce desalinated water and hydrogen fuel while continuing to generate electricity (citation needed). This could introduce new industrial activities on-site if the license is extended.

Option 2: Plant closes around 2030

If PG&E's license renewal application is denied or withdrawn, the site would undergo decommissioning after 2030, triggering a series of land-use changes.

- **Tribal land transfer:** The yak titYu titYu yak tiłhini Northern Chumash Tribe (ytt Tribe) has been actively working to reclaim its ancestral homeland, including the Diablo Canyon site. Following a 2019 California Public Utilities Commission policy mandating utilities offer disposed lands to tribes first, the ytt Tribe secured a memorandum of understanding to acquire the site.
- **Habitat conservation and restoration:** Decommissioning would open the door for restoring the property's natural coastal habitats. The ytt Tribe has emphasized that reclaiming its role as stewards of the land will protect and preserve these ecologically significant areas.
- **Limited public access:** Access to some parts of the land is already available through a limited public access program. That program's fate after decommissioning would be determined as part of a final land use plan.

- **Radioactive waste storage:** High-level radioactive waste, or spent nuclear fuel, would remain on-site in dry cask storage for decades until a federal repository becomes available. This would require a portion of the site to be cordoned off for the long-term management of radioactive material.

The ongoing decision-making process

As PG&E continues to seek federal approval for the 20-year extension, discussions are ongoing through the Diablo Canyon Decommissioning Engagement Panel and with state agencies like the California Coastal Commission and State Lands Commission. The long-term land use beyond 2030 hinges on the outcome of the license renewal process and subsequent legal and regulatory agreements.

8.3.2 Water

DCPP relies on ocean water for cooling its reactors. The plant uses a once-through cooling system, drawing water from the Pacific Ocean to remove heat from the reactor and the steam generators. The cooling water intake is significant, with the plant withdrawing several hundred million gallons of seawater daily—averaging roughly 2 billion gallons per day during peak operations. A preliminary economic impact assessment is presented in Appendix C below.

What are the opportunities and potential impacts of DCPP water use to be conjunctive with other activities? Examples would include, but not be limited to desalination to backstop local municipal water supplies (including those for agriculture), firefighting, and pump storage for distributed hydropower.

Moreover, fresh water from cooling operations could conceivably be recycled to an appropriate reservoir using its waste heat to facilitate transfer pumping. For reference, Lopez Lake in SLO county has a capacity of 13.5 billion gallons and Cachuma lake in SB County has a capacity of 16.9 billion gallons, 6 and 8 times the average peak volume of DCPP cooling water. A comprehensive cost-benefit review of DCPP's established and prospective water resource strategies could be valuable.

8.3.3 Fire mitigation

In addition to conjunctive use for firefighting, stored water can be dedicated to local ecosystem services that stabilize water tables, promoting soil and forest health and reducing wildfire risk

8.3.4 Recreation

DCPP properties could be selectively eligible to provide a broad spectrum of public and private recreational services, including public-private partnerships and concessions.

9 References

- Bauer, Thomas, Sebastian T. Braun, Michael Kvasnicka, Nuclear power plant closures and local housing values: Evidence from Fukushima and the German housing market, *Journal of Urban Economics*, Volume 99, 2017, Pages 94-106, ISSN 0094-1190,
- Bureau of Economic Analysis. Regional Economic Accounts. (2018) Accessed at <https://apps.bea.gov/regional/downloadzip.cfm>
- Fort, T.C., Haltiwanger, J., Jarmin, R.S. and Miranda, J. "How firms respond to business cycles: The role of firm age and firm size." *IMF Economic Review*, 61(3), (2013) pp.520-559.
- Flyvbjerg, Bent, Mette K. Skamris Holm, and Søren L. Buhl. "How common and how large are cost overruns in transport infrastructure projects?" *Transport reviews* 23, no. 1 (2003): 71-88.
- ISSN 0094-1190, Mayeda, P., and K. Riener. "Economic Benefits of Diablo Canyon Power Plant: An Economic Impact Study." (2013).
- Pesaran, M. Hashem, and Martin Weale. "Survey expectations." *Handbook of economic forecasting* 1 (2006): 715-776.
- Sovacool, Benjamin K., Daniel Nugent, and Alex Gilbert. "Construction cost overruns and electricity infrastructure: an unavoidable risk?" *The Electricity Journal* 27, no. 4 (2014): 112-120.
- Taylor, Karl, and Robert McNabb. "Business cycles and the role of confidence: evidence for Europe." *Oxford Bulletin of Economics and Statistics* 69, no. 2 (2007): 185-208.

10 Appendix A – The Volumetric Performance Fee

The Volumetric Performance Fee (VPF) for Diablo Canyon is set directly in **Senate Bill 846 (2022)** at **\$13 per megawatt-hour**. This differs from the typical process where the California Public Utilities Commission (CPUC) would set such fees through a detailed ratemaking process. The VPF is an important revenue source and delivers an array of services to ratepayers and California generally.

10.1 Adjustment potential

- **Legislative Change:** The VPF can be adjusted by the state legislature through a new bill, similar to how it was initially established. The CPUC does not have the authority to change the fee amount independently.
- **Annual Escalation:** While the fee amount itself is set in statute, PG&E includes proposed adjustments for a Fixed Management Fee (which is separate but related to the VPF) in its annual application to the CPUC. These proposals use escalation methodologies and are subject to CPUC approval. However, some groups oppose certain escalation methods, arguing that they do not accurately reflect the risks associated with the generation assets.

10.2 Purpose and use of fees

- The VPF is intended to compensate PG&E for operating the aging plant, including potential liability and risks, and to advance "public-purpose priorities".
- PG&E is required by law to spend these fees on specific priorities, such as accelerating grid connections, reducing operational and system risk, and other public benefits.
- PG&E shareholders are explicitly prohibited from profiting from these fees.
- The fees are collected from customers of PG&E, Southern California Edison, and San Diego Gas & Electric because Diablo Canyon is considered a resource benefiting the entire state.

Mechanisms ensuring PG&E spends the Volumetric Performance Fee (VPF) compliantly are overseen by the California Public Utilities Commission (CPUC) and include strict reporting, mandatory fund allocation rules, and an annual review process. The system, however, has drawn criticism for potentially not providing sufficient detail to guarantee shareholders do not benefit.

10.3 Mandatory spending and reporting

- **Holding in a subaccount:** VPF revenues collected by PG&E must be held in the Volumetric Performance Fees Subaccount of the Diablo Canyon Extended Operations Balancing Account (DCEOBA), which tracks the plant's costs.
- **Attestation by Chief Financial Officer:** PG&E is required to submit an annual attestation signed by its Chief Financial Officer, affirming that the programs funded with VPF revenues fall within the specific categories outlined in the Public Utilities Code.
- **Project specifics:** PG&E must detail the specific projects funded by the VPF, including an estimate of how many customers benefit from each project and how it helps control customer bills.
- **Annual application and review:** The CPUC annually reviews PG&E's application for Diablo Canyon Extended Operations, including its planned expenditure of VPFs. This application details projected costs, revenues, and the proposed use of the fees.

10.4 Spending hierarchy and limitations

- **Cost coverage priority:** Under CPUC rules, PG&E must use VPF revenue to cover extended operations costs that exceed 115% of its forecast, before allocating the remaining funds to other public purpose priorities.
- **Public purpose priorities:** If VPF revenue is not needed to cover cost overruns, it can be spent on six public-benefit categories:
 - Bringing new customers' power online
 - Ensuring customer and employee safety
 - Adding more renewable or zero-carbon energy to the grid
 - Reducing the carbon footprint of buildings
 - Improving grid resilience
 - Funding public education and communication
- **Prohibition of shareholder profit:** State law explicitly prohibits PG&E shareholders from profiting from the VPFs.

10.5 Other VPF Use Cases

In its 2025 and 2026 advice letters and applications to the California Public Utilities Commission (CPUC), Pacific Gas and Electric (PG&E) outlined several projects to be funded by the Volumetric Performance Fee (VPF). The specific projects change annually but fall under the six categories of public-purpose priorities defined by state law.

10.6 Examples of projects funded by the VPF

10.6.1 Expedited hydroelectric asset maintenance (2025)

- **Public purpose category:** Increasing resilience and reducing operational and system risk.
- **Project description:** PG&E planned to use VPF funds to accelerate the inspection and maintenance of its hydroelectric assets, which are a crucial component of California's renewable energy mix. This includes performing additional corrective and routine maintenance on water storage and delivery assets, such as spill channels, gates, and valves.

10.6.2 Building electrification (2025)

- **Public purpose category:** Accelerating building decarbonization.
- **Project description:** In its 2025 application, PG&E proposed using VPF funding to expand its energy efficiency programs for small businesses to include more beneficial electrification measures, such as heat pump water heaters, heat pump space conditioning, and commercial electric ovens and fryers. The fees would cover the costs of installation labor and materials for these specific measures.

10.6.3 New customer connection projects (2026)

- **Public purpose category:** Accelerating generator interconnections and bringing new customers online.
- **Project description:** For 2026, PG&E's VPF spending plan includes funding for projects that expedite the interconnection of new generation sources to the grid. This aligns with California's goal of accelerating the integration of renewable energy.

10.6.4 Grid modernization and safety (Ongoing)

- **Public purpose category:** Modernizing the electrical grid and increasing resiliency.
- **Project description:** As the Volumetric Performance Fees are collected annually, PG&E has allocated funding toward projects that address general grid modernization and safety. These projects help to create a more resilient grid that can handle a larger influx of renewable and zero-carbon energy.

Example:

A specific example of a grid modernization project funded by the Volumetric Performance Fee (VPF) is the **Seasonal Aggregation of Versatile Energy (SAVE) program**. This virtual power plant (VPP) project, launched by PG&E in March 2025, uses residential distributed energy resources to reduce strain on the local grid during peak demand.

How the SAVE program works

- **Virtual power plant (VPP):** Instead of building a new, large power plant, a VPP aggregates power from many small, distributed energy resources.
- **Residential participants:** The SAVE VPP program includes up to 1,500 residential customers with battery energy storage systems and up to 400 customers with smart electric panels.
- **Targeted relief:** From June through October 2025, the program was activated for up to 100 hours to provide targeted relief to specific neighborhoods identified as having constrained electric grids.
- **Load flexibility:** By using battery power and load flexibility from customer homes, the program provides support during peak demand periods when substations and feeder lines are nearing their capacity limits.
- **Benefits:** This approach helps to avoid or defer expensive utility-scale infrastructure upgrades and reduces overall costs for ratepayers.

The VPF connection

While the SAVE program is part of PG&E's larger grid modernization effort, it is specifically mentioned as an **Electric Program Investment Charge (EPIC) demonstration**. The VPF can be used to fund such public-purpose projects and is intended to accelerate the deployment of advanced clean energy technologies, particularly those that improve grid reliability and resilience.

10.7 Oversubscription and cost overruns

In addition to funding specific public-purpose projects, the VPF is also used to cover cost overruns for the extended operation of the Diablo Canyon Power Plant itself. By law, if costs for the plant's extended operation exceed 115% of PG&E's approved forecast, VPF revenue must be used to cover those costs first, before being allocated to public-purpose projects. This has led to criticism that the fee is being used to subsidize the plant's operational costs rather than funding new public-benefit projects.

10.8 VPF Impacts on Rates

The Volumetric Performance Fee (VPF) adds to the cost of California energy bills for customers of [PG&E](#), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E). However, it is just one component of overall bill changes and its effect varies among customers.

10.8.1 Who pays and how much

- **A statewide charge:** Unlike most utility fees, the \$13-per-megawatt-hour VPF is charged to customers of all three major utilities, not just PG&E. The logic is that Diablo Canyon benefits the state's entire grid.
- **Small, cumulative impact:** The fee's individual impact is a relatively small portion of a total bill, but it contributes to the overall trend of rising energy costs. In 2026, PG&E has forecasted the total VPF to be \$190.8 million for its customers, \$59.7 million for SCE customers, and \$12.9 million for SDG&E customers.

10.8.2 Context within overall rate design

To understand the VPF's effect, it's important to consider other changes to California's rate design:

- **Offsetting lower volumetric rates:** In May 2024, the California Public Utilities Commission (CPUC) introduced new income-graduated fixed charges (IGFCs) that reduce volumetric rates (the per-kilowatt-hour cost). The goal is to make power consumption cheaper.
- **Variable impact on customers:** While IGFCs mean average bills will stay steady, the actual effect depends on energy usage.
 - **High-usage customers:** The VPF and other fixed charges are offset by the lower volumetric rates, which means high-usage customers will generally see a lower bill.
 - **Low-usage customers:** Customers who conserve energy or have their own generation (such as solar panels) will see a higher bill, as their low usage does not sufficiently offset the fixed charges like the VPF.
- **Solar customers:** For solar customers, the impact can be more significant. Unlike other charges, the non-bypassable VPF cannot be offset by excess solar generation exported to the grid. This means a solar customer who produces as much power as they use must still pay the VPF.

10.9 Broader cost landscape

It's important to remember that many other factors are driving increases in California's electricity costs:

- **Wildfire mitigation:** Costs for upgrading infrastructure to prevent wildfires are a major driver of rate increases.
- **Infrastructure investments:** Modernizing the grid to support the energy transition also adds costs.
- **Underperforming programs:** A March 2025 report by the Public Advocates Office criticized the underperformance of some ratepayer-funded programs, which have added to utility bills without providing commensurate benefits.

11 Appendix B – Estimating Indirect, and induced economic impacts of DCP operations

One of the fundamental insights of economics is the so-called “multiplier”, a simple idea that encapsulates the myriad interactions of supply and demand across the modern economy. The complexity of today’s economy is such that policies relying on intuition or rules-of-thumb alone are unlikely to achieve any close to optimality. Direct policy-economy linkages (a public expenditure, a policy raising a worker’s wage, etc.) are easy to measure because they entail one transfer of value between two actors. The economic impact only begins here, however, and linkages from the two direct actors will propagate through indirect (supply chain) and induced (expenditure) effects across the rest of the economy. The multiplier concept aggregates these, and we often see that indirect and induced impacts outweigh direct ones, making them particularly important for policy makers to consider.

The generally accepted methodology for multiplier analysis is so-called input-output modeling, which divides the economy into a tabular system of interactions between production activities, demand, and resource use. The Impact Analysis for PLANning (IMPLAN) model is a non-survey Social Accounting Matrix (SAM) calibrated to detailed transactions data. IMPLAN is perhaps the most widely used assessment tool for modeling the economic impacts of economic events. IMPLAN was originally developed in the late 1970’s and early 1980’s to support economic impact analysis for the United States Forest Service. The first version of the IMPLAN Pro, IMPLAN’s modeling platform, was released in 1996. The current version of IMPLAN, version 3, was released in 2023. The data behind the regional accounts are updated annually, with the most current version (used in this study) is based on 2022 data.

The IMPLAN model is designed to generate multipliers, which are used to estimate direct, indirect, and induced effects of an exogenous change in household or industry demand for various activities. Moreover, the IMPLAN model is regionalized using regional purchase coefficients (RPCs) that attempt to estimate the percentage of industry purchases coming from within the region and the percentage that are imported. Purchases of imports, which can come from other states or countries, are considered a leakage from a regional economy. The regional level for the IMPLAN model we are using is San Luis Obispo and Santa Barbara counties, further calibrated to US Census tract data on income and demographic data.

In particular, we followed Roland-Holst et al (2024)³¹ in their application of IMPLAN to LA City's last Minimum wage ordinance. We applied more recent (2022) ZIPCODE level IMLAN data on the counties of San Luis Obispo and Santa Barbara, according to Census data. The zip codes included are the following:

San Luis Obispo Country

93446, 93454, 93405, 93420, 93422, 93401, 93444, 93402, 93433, 93442, 93465, 93449, 93445, 93451, 93428, 93453, 93461, 93430, 93426, 93435, 93432, 93452, 93224, 93254, 93424, 93448, 93483, 93475, 93403, 93406, 93408, 93407, 93410, 93409, 93412, 93421, 93423, 93443, 93447

Santa Barbara County

93436, 93458, 93117, 93455, 93454, 93001, 93101, 93105, 93103, 93111, 93013, 93110, 93109, 93108, 93463, 93434, 93460, 93427, 93106, 93252, 93437, 93440, 93254, 93441, 93429, 93067, 93457, 93456, 93464, 93438, 93014, 93102, 93107, 93116, 93120, 93118, 93130, 93121, 93150, 93140, 93190, 93160, 93199

³¹ https://bearecon.com/Tools/LAC_viz.html

12 Appendix C – Preliminary Impact Assessment of DCP Water Recycling

The California Coastal Commission has asked PG&E to consider revising its environmental impact mitigation plan, especially the effects of the plant's cooling system on marine life. This appendix offers initial estimates the cost of a comprehensive recycled water alternative, including a comparison to general economic benefits from such a large local construction and infrastructure management project. Costs of this ambitious mitigation plan would be substantial, but so would the benefits of retaining DCP's local operations, statewide revenue, and the stimulus from new investment. These initial macro estimates for the tri-county area can be developed in much greater detail if needed.

What follows is a very preliminary cost estimation for a Diablo recycled-water alternative against the current once-through cooling. This CAPEX/OPEX modeling summarized below yields levelized expected annual costs of about \$230-235M. Direct, indirect, and induced benefits of this local and regional spending would be about \$350M, while retaining DCP operations was estimated in the main report to yield about \$400M³², yielding a benefit/cost ratio of the overall mitigation project of more than 3. Thus, conversion of the present cooling technology, eliminating all marine withdrawals, would be a potent economic stimulus for the coastal region and the state as a whole.

12.1 Cooling water volumes

12.1.1 Current once-through system (actual)

From Diablo Canyon engineering and State Water Board documents:

- Once-through seawater flow:
 - ≈ 2,497 million gallons per day (MGD) circulating-water flow for both units.
- Plant output:
 - ≈ 2,200–2,300 MW net, ~18,000 GWh/year in recent years.

Rough specific withdrawal:

- 2,497MGD over ~2.0–2.1 GW → ~50 gal/kWh withdrawn, nearly all returned to the ocean slightly warmer.

³² This number is discounted to allow for an increment of ~20% in the levelized cost of electricity from the remodelled facility.

12.1.2 Closed-cycle towers with recycled water (concept, checked vs tower study)

The State Water Board/Bechtel retrofit study for Diablo's closed-cycle towers (their "preferred configuration") finds:

- Tower makeup flow: about 108 MGD total for both units.
- Reduction in ocean withdrawals: about 96% relative to 2,497 MGD OTC.

Those two numbers match internally: if you cut 2,497 MGD down to ~108 MGD, you've reduced withdrawals ~96%. Now normalize 108 MGD to Diablo's output:

- 108 MGD $\approx$ 2 gal/kWh consumed (evaporation + blowdown), instead of ~50 gal/kWh withdrawn and returned.

12.1.3 Summary

Earlier, we assumed ~100 MGD reclaimed-water demand for Diablo towers. The Bechtel value of 108 MGD confirms this order-of-magnitude: we're within ~10%. This approach yields a 96% reduction in net water consumption:

- Today: 2,500 MGD seawater withdrawn, ~50 gal/kWh (mostly returned).
- Reclaimed-water tower concept: $\approx$ 100–110 MGD *consumed*, ~2 gal/kWh.

12.2 Pipeline lengths for reclaimed water conveyance

No one has built these lines, so here we are necessarily in order-of-magnitude territory, but we can cross-check distances.

Key recommendation: This analysis treats Diablo as a hub and nearby wastewater plants as potential reclaimed-water sources, integrating the following

- City of San Luis Obispo WRRF $\rightarrow$ Diablo
 - SLO is about 12 mi from Diablo in straight-line distance; a realistic pipe alignment along roads/ROWs with topography is ~15–20 route miles.
- Morro Bay / Los Osos $\rightarrow$ Diablo
 - North of Diablo; mapping distances put straight-line in the 10–15 mi range, so ~20–30 route miles of real pipeline is reasonable.
- Pismo/Oceano / South SLO Co. Sanitation District $\rightarrow$ Diablo
 - South of SLO; again, straight-line teens of miles, ~25–30 route miles of pipe with terrain/ROW.

A multi-source reclaimed-water system feeding roughly 100 MGD to Diablo would therefore require one or more trunk lines each on the order of 15–30 miles from the main WRRFs to Diablo, plus smaller interties between plants. This is fully consistent with other large water projects (e.g., Phoenix-area pipelines to Palo Verde are ~30–40 miles).

12.3 Net GWh output impact compared with once-through cooling

The Diablo closed-cycle cooling study explicitly quantifies the performance impact of towers (before adding reclaimed water):

- Energy penalty: about 5% of Diablo’s annual generation.
- With ~18,000 GWh/year output today, that’s ≈
 - $0.05 \times 18,000 \approx 900$ GWh/year of lost net generation.

That 5% includes:

- Higher condenser backpressure with tower cooling, and
- Cooling-tower fans and on-site pumps.

Now we “stack on” reclaimed water:

- Extra parasitic loads from off-site pumping and advanced treatment for ~100 MGD are likely single-digit MW (on the order of a few tenths of a percent of plant output), so they don’t materially change the ≈5% (~900 GWh/yr) penalty headline.

We previously estimate “~900 GWh/yr lost, ~100 MW effective reduction.” That matches the tower study’s 5% penalty applied to Diablo’s historical output:

- OTC today: ~18,000 GWh/yr.
- Towers + reclaimed: ~17,100 GWh/yr (roughly), i.e., ~900 GWh/yr less delivered energy.

12.4 Cost comparison

From the Diablo closed-cycle retrofit cost analysis (20-year evaluation, 7% discount rate):

- Annualized incremental cost (towers vs. OTC) is about \$230–235M/year, made up of:
 - Capital recovery for towers and site works
 - Extra O&M
 - Monetized energy penalty (lost GWh)

When expressed per MWh of Diablo's output, that study finds roughly:

- Energy-penalty cost: $\approx$ \$7–8/MWh.
- Total incremental cost (capital + O&M + energy): $\approx$ \$12–13/MWh.

With Diablo's all-in cost historically around \$60/MWh, that's roughly a ~20% increase in LCOE just for switching from once-through to closed-cycle towers.

Then add reclaimed water:

- Long pipelines, pump stations, and advanced treatment will add both capex and O&M.
- At Diablo's scale, that's plausibly a few extra dollars per MWh, not another \$20/MWh.

So a checked, reasonable range is:

Total cooling-system adder (towers + reclaimed water) vs. OTC:
roughly +\$13–16/MWh.

This estimate is consistent with the tower study baseline (\$12–13/MWh) plus a modest allowance for reclaimed-water infrastructure.

Table 12.1: Current OTC (Pacific) vs Reclaimed-water tower concept for Diablo:

Aspect	Once-Through Cooling (today)	Reclaimed-Water Closed-Cycle Towers (concept)
Water volume	~2,500 MGD seawater withdrawn, mostly returned (≈ 50 gal/kWh)	~100–110 MGD reclaimed water consumed (≈ 2 gal/kWh)
Marine impact	High entrainment/impingement; 2.5 BGD ocean intake	~96% reduction in seawater withdrawals; much lower marine impact
Pipelines	None beyond existing intake/discharge	~15–30 mi trunk lines from regional WRRFs (multi-source, ~100 MGD total)
Net generation	~18,000 GWh/yr	~17,100 GWh/yr (≈ 900 GWh/yr loss, ~5%)
Cost adder vs OTC	Baseline	$\approx +\$12\text{--}13/\text{MWh}$ (towers alone) → $\approx +\$13\text{--}16/\text{MWh}$ including reclaimed-water infrastructure

Bottom line check:

- The order-of-magnitude reclaimed-water volume (~100 MGD) and pipeline lengths (15–30 mi) are consistent with Diablo’s official tower-retrofit numbers and local geography.
- The energy penalty (~900 GWh/yr) and cost adder (~\$13–16/MWh) lines up with the closed-cycle cooling study when you add a reasonable reclaimed-water layer on top.

13 Appendix D —Econometric Validation of Community Benefits

13.1 Purpose and Summary

This appendix expands on sections 2-4 of the main report, using more technical analysis to expand and reaffirm the arguments that a single large employer's local payrolls can drive three critical dimensions of the San Luis Obispo (SLO) and Santa Barbara (SB) county economy: residential home prices, real estate sector output, and the cost of outstanding municipal debt. The current analysis covers 28 ZIP codes from 2015Q1 through 2024Q4 (947 ZIP-quarter observations) and uses average annual compensation from the Diablo Canyon Power Plant (DCPP) workforce as the primary salary proxy — an exogenously determined income anchor in a region with limited other large employers. All models are estimated with HC1-robust ordinary least squares (OLS), and the preferred specification for each outcome uses ZIP code fixed effects (FE) to isolate within-locality, over-time salary effects.

13.1.1 Central Findings

DCPP-anchored salary growth is the common engine behind all three outcomes. Put as simply as possible, these results show that a 1% increase in average local DCPP salary is associated with:

- +1.79% higher in median home prices (ZIP FE, Adj. $R^2 = 0.84$) — a greater-than-unity elasticity reflecting coastal supply constraints that amplify demand shocks into price gains;
- +0.69% higher county Real Estate and Rental/Leasing GDP (ZIP FE, Adj. $R^2 = 0.97$) — a positive but sub-unity elasticity, reflecting that productive real estate activity responds to income but is constrained by limited supply capacity; and
- -0.68% lower par-weighted average coupon rate on outstanding municipal debt (ZIP FE, Adj. $R^2 = 0.72$) — a negative elasticity of nearly the same absolute magnitude as the GSP elasticity, reflecting the fiscal dividend of a wealthier local economy: higher incomes expand the property tax base supporting bond repayment, compress credit spreads, and enable municipalities to refinance legacy high-coupon debt at lower rates.

The near-symmetry between the GSP elasticity (+0.69) and the coupon elasticity (-0.68) is a key result: the same salary increase associated with higher real estate sector value simultaneously reduces the debt-service burden on the public capital that finances local infrastructure and public services. Home prices respond with a much larger amplification

factor (+1.79), driven by the demand–supply imbalance familiar in coastal California housing markets.

Table 13.1: Key Results at a Glance

Dependent Variable	ZIP FE Elasticity	Adj. R²	Optimal Lag	Economic Channel
Median Home Price	+1.788***	0.839	L=0 (contemporaneous)	Demand amplified by supply inelasticity
County Real Estate GSP	+0.693***	0.967	L=0–4 (annual cycle)	Positive, sub-unity; production lags income
Avg. Coupon on Outstanding Debt	-0.679***	0.720	L=0 (structural)	Fiscal dividend; mirrors GSP elasticity in magnitude

13.1.2 Methodology in Brief

Three specifications are estimated for each outcome: Pooled OLS (baseline), County Fixed Effects (absorbs time-invariant county heterogeneity), and ZIP Code Fixed Effects (preferred; identifies salary effects from within-ZIP time variation only). Pooled OLS produces systematically distorted estimates for all three outcomes — a three-way Simpson’s Paradox³³ in which cross-sectional composition reverses or annihilates the true within-locality salary relationship. Distributed lag models (lags 0–8, ZIP FE throughout) test whether salary effects transmit with delay; optimal lag length is selected by AIC. Home prices and coupon costs adjust contemporaneously (L=0 optimal), while real estate GSP requires up to four quarterly lags (L=4 optimal) to fully absorb a salary shock.

13.1.3 Event Study Highlights

An event study benchmarks all three outcomes against a pre-COVID linear counterfactual trend (2015Q1–2019Q4 baseline). Six event windows reveal how shocks propagate differently across the three variables — four macro-cycle windows and two DCPD-specific policy events (E5 and E6 use a local pre-announcement baseline; see Event Study section for methodology):

³³ See https://en.wikipedia.org/wiki/Simpson%27s_paradox

Table 13.2: Summary of Event Study Results by Source of Impact

Event Window	Price Abn.	GSP Abn.	Coupon Abn.	Interpretation
E1: COVID Shock (2020Q1–2020Q3)	–1.3%	–4.1%	+0.25%	Transaction freeze hits GSP hardest; prices cushioned by DCPD income stability; fixed-rate bonds immune to rate disruption
E2: Pandemic Boom (2020Q4–2022Q2)	+16.5%	–2.3%	+0.11%	Remote-work migration drives price overshoot; output constrained by supply; low-rate issuances lower coupon cost
E3: Rate Hike (2022Q2–2023Q2)	+23.2%	–1.6%	+5.15%	Rate-lock sustains elevated prices; volumes collapse; coupon cost rises above trend as legacy bonds dominate stack
E4: Recovery (2023Q3–2024Q4)	+20.5%	–1.4%	+11.09%	Prices stabilize ~20% above trend; GSP gradually recovers; SLO 2023 issuance at 4.59% raises outstanding cost to decade high
E5: DCPD Closure Ann. (2016Q2–2017Q2)*	–3.7%	+4.2%	+2.9%	Prices soften below pre-announcement trajectory; GSP continues growth; coupon costs edge upward as markets price long-run fiscal exposure
E6: SB 846 DCPD Extension (2022Q3–2023Q2)	+21.1%	–1.7%	+5.68%	Extension confirms DCPD employment anchor; prices remain elevated vs. long-run trend amid rate lock; coupon costs rise with interest rate environment; confounded by E3 rate-hike cycle

13.1.4 Data Sources

Salary: DCPD Compensation Data (annual, ZIP-level, 2015–2024). Home prices: Redfin median sale price, All Residential, monthly by ZIP. Real estate GSP: BEA CAGDP9 county-level NAICS 53, real chained 2017 dollars, seasonalized via FRED series CARERENTLEARNQGSP. Municipal bond coupon: CDIA DebtWatch — 37 county-level bond issuances (SLO and SB, 1984–2024), par-weighted average coupon (NIC) on outstanding stock.

13.2 Data and Methodology

13.2.1 Sample

The panel covers 28 ZIP codes in San Luis Obispo (SLO) and Santa Barbara (SB) counties, observed quarterly from 2015Q1 through 2024Q4, yielding 947 ZIP-quarter observations (755 in SLO, 192 in SB). All continuous variables are expressed in natural logarithms so that slope coefficients are interpretable as constant elasticities.

Table 13.3: Variables

Variable	Source	Definition
ln(Price)	Redfin	Log quarterly median sale price, All Residential, by ZIP (\$)
ln(GSP)	BEA CAGDP9 / FRED	Log county Real Estate & Rental/Leasing GDP (NAICS 53), real chained 2017\$ millions, quarterly via CA seasonal factors
ln(Coupon)	CDIAC DebtWatch	Log par-weighted avg. coupon (NIC, %) on all municipal bonds outstanding in SLO/SB county each quarter; constructed from 37 issuances (1984–2024)
ln(Salary)	DCPP Comp Data	Log avg. annual salary (incl. temp upgrade), interpolated annually to quarterly at ZIP level

Avg_Coupon_Outstanding construction: For each CDIAC bond i with par P_i , coupon (NIC) r_i , sale date d_i , and final maturity m_i , bond i is outstanding in quarter t if $d_i \leq t_{\text{end}}$ and $m_i \geq t_{\text{start}}$. Quarterly weighted average: $\sum(P_i \times r_i) / \sum P_i$. Where NIC was missing (3 of 37), the national AAA-equivalent GO benchmark was substituted at issuance date. SLO mean = 5.70% (elevated by CDIAC 1997-0907: \$53.2M at 8.375%, outstanding through 2029); SB mean = 4.13% (recent issuance history, post-2000 low-coupon bonds dominant). Series declines from ~6.4% in 2015Q1 to ~5.2% by 2024Q4.

13.2.2 Estimation Strategy

Three progressively richer specifications were estimated for each of the three dependent variables:

- (1) Pooled OLS: single intercept, baseline elasticity.
- (2) County FE: SLO county indicator (SB omitted) absorbs time-invariant county-level unobservables.
- (3) ZIP FE (preferred): 27 ZIP indicators absorb all permanent cross-sectional heterogeneity; salary elasticity identified from within-ZIP time variation only.

All SEs are HC1 heteroskedasticity-robust. The central thesis: DCPD-anchored salary growth is the common engine behind all three outcomes — it raises home prices, expands real estate sector output, and lowers the effective cost of delivering public goods and services.

13.2.3 Contemporaneous OLS Results

This section presents the three-specification OLS results for all three dependent variables in sequence. The central finding is consistent: DCPD-anchored salary growth is a statistically significant driver of home prices (positive), real estate sector output (positive), and the cost of outstanding public capital (negative). ZIP fixed effects are essential for all three outcomes.

Table 13.4: Dependent Variable: ln(Median Sale Price)

*HCl-robust SEs in parentheses. *** $p < 0.01$. ZIP FE: 27 ZIP indicators suppressed.*

	Pooled OLS	County FE	ZIP FE (preferred)
ln(Avg Salary)	1.6894***	1.5184***	1.7883***
	(0.0644)	(0.0815)	(0.0536)
County: SLO	—	0.1727***	—
	—	(0.0265)	—
Observations	947	947	947
Adj. R²	0.391	0.414	0.839
RMSE	0.3273	0.3211	0.1684
AIC	-2113.3	-2148.5	-3345.9

13.2.4 Summary

Pooled OLS: A 1% salary increase is associated with a +1.69% rise in home prices ($t = 26.2$). Adj. $R^2 = 0.391$; the large residual reflects omitted ZIP-level heterogeneity.

County FE: Elasticity moderates slightly to +1.5184. The SLO county dummy (+0.1727, $t = 6.5$) captures the structural price differential between counties after controlling for salary. Adj. R^2 rises to 0.414.

ZIP FE (preferred): Elasticity is +1.7883 ($t = 33.4$, Adj. $R^2 = 0.839$). The elasticity exceeding unity reflects coastal supply constraints: demand shocks pass through to prices more than one-for-one. Adj. R^2 jumps to 0.84, confirming most cross-sectional price dispersion is structural rather than salary-driven.

**Table 13.5: Dependent Variable: $\ln(\text{County Real Estate GSP})$
(real \$M chained 2017)**

*HCl-robust SEs in parentheses. *** $p < 0.01$. County GSP assigned uniformly within county.*

	Pooled OLS	County FE	ZIP FE (preferred)
$\ln(\text{Avg Salary})$	-0.1120**	0.3783***	0.6928***
	(0.0503)	(0.0157)	(0.0125)
County: SLO	—	-0.4952***	—
	—	(0.0065)	—
Observations	947	947	947
Adj. R^2	0.007	0.906	0.967
RMSE	0.1935	0.0596	0.0353
AIC	-3108.5	-5338.3	-6302.9

13.2.5 Summary

Pooled OLS: The pooled model yields a negative elasticity (-0.1120, $t = -2.2$) with near-zero Adj. R^2 (0.007). This is a textbook instance of Simpson's Paradox: within each county the salary–GSP relationship is positive, but pooling reverses the sign.

County FE: Sign corrected to +0.3783 ($t = 24.2$). Adj. R^2 rises dramatically to 0.906. The SLO dummy (-0.4952) reflects structural differences in the GSP level between counties once salary differences are controlled.

ZIP FE (preferred): Elasticity rises to +0.6928 ($t = 55.4$, Adj. $R^2 = 0.967$). The sub-unity elasticity indicates the productive real estate sector response is less than proportional to salary growth — supply-side constraints limit expansion of transaction volumes even as asset prices surge.

Table 13.6: Dependent Variable: $\ln(\text{Avg_Coupon_Outstanding, \%})$ *HCl-robust SEs in parentheses. *** $p < 0.01$.*

	Pooled OLS	County FE	ZIP FE (preferred)
$\ln(\text{Avg Salary})$	0.0077	-0.3627***	-0.6792***
	(0.0375)	(0.0176)	(0.0138)
County: SB (lower)	—	-0.3742***	—
	—	(0.0069)	—
Observations	947	947	947
Adj. R^2	-0.001	0.821	0.720
RMSE	n/a	n/a	0.0435
AIC	-3547.5	-5177.5	-5934.0

13.2.6 Summary

Pooled OLS: Near-zero and insignificant (+0.0077, $t = 0.21$). The national interest rate cycle dominates cross-sectional coupon variation, masking the salary–cost relationship without fixed effects.

County FE: Sign reverses to strongly negative (-0.3627, $t = -20.6$). The SB dummy (-0.3742, $t = -54.4$) confirms SB carries structurally lower coupon costs than SLO — consistent with SB’s more recent issuance history versus SLO’s \$53.2M 1997 bond at 8.375%.

ZIP FE (preferred): Elasticity is -0.6792 ($t = -49.3$, Adj. $R^2 = 0.720$, RMSE = 0.0435). A 1% salary increase lowers the cost of outstanding public capital by 0.68%. Two reinforcing fiscal channels: (i) higher property values expand the tax base underpinning GO bond repayment; (ii) higher household income reduces fiscal stress and enables refinancing legacy high-coupon debt at progressively lower rates.

Table 13.7: Cross-Specification Comparison and the Three-Way Simpson's Paradox

Comparing pooled OLS to ZIP FE estimates reveals a three-way Simpson's Paradox:

Dependent Variable	Pooled OLS Elasticity	ZIP FE Elasticity	Pooled Distortion
Median Home Price	+1.689***	+1.788***	Understated in pooled
County Real Estate GSP	−0.112**	+0.693***	Sign reversal in pooled
Avg. Coupon Outstanding	+0.008	−0.679***	Collapses to zero in pooled

In all three cases, cross-sectional composition confounds the within-ZIP relationship. ZIP fixed effects are not optional for any of these outcomes.

The three ZIP FE elasticities form a coherent economic narrative: salary growth raises home prices by 1.79× (demand amplified by supply inelasticity), expands real estate output by 0.69× (positive but supply-constrained), and lowers public borrowing costs by 0.68× (the fiscal dividend of a wealthier local economy). The near-symmetry of the GSP and coupon elasticities is notable: the same income channel that expands real estate output simultaneously reduces the debt burden financing the infrastructure underlying that output.

13.3 Distributed Lag Analysis

This section tests whether salary effects transmit contemporaneously or with lags. Unrestricted distributed lag (UDL) models with ZIP FE retained throughout:

$$\ln(Y_{it}) = \alpha_i + \sum_l \beta_l \cdot \ln(\text{Salary}_{it-l}) + \varepsilon_{it}, \quad l = 0, 1, \dots, 8$$

Optimal lag selected by AIC. Results differ markedly across the three DVs, reflecting their fundamentally different adjustment mechanisms.

Table 13.8: Lag Selection: $\ln(\text{Median Sale Price})$, ZIP FE

*Optimal: $L=0$. $L(k)$ = coefficient on k -th lag of $\ln(\text{Salary})$. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Lag	N	Adj.R ²	AIC	BIC	L(0)	L(1)	L(2)	L(3)	L(4)
0	947	0.8389	-3345.9	-3205.1	+1.788***	—	—	—	—
1	919	0.8391	-3258.2	-3113.5	-0.300	+2.088***	—	—	—
2	891	0.8375	-3165.4	-3026.4	+1.075***	-1.546***	+2.299**	—	—
3	865	0.8378	-3094.6	-2956.5	+0.832***	+0.557	-2.037**	+2.513**	—
4	840	0.8359	-3008.4	-2866.4	+0.460*	+1.154***	-1.115	-0.387	+1.757*
5	815	0.8438	-2988.6	-2842.8	+0.020	+1.385***	-0.596	+1.022	-2.587**
6	790	0.8460	-2929.0	-2779.5	+0.552**	+0.194	-0.131	+1.487	-1.071
8	740	0.8405	-2748.4	-2596.4	+0.210	+1.108**	-1.204	+1.469	-0.570

Optimal: $L=0$ (AIC = -3,345.9, minimum across all lags). Adj. R^2 is flat (0.836–0.846) and no lagged coefficient achieves 1% significance once contemporaneous salary is included. Alternating signs at longer lags reflect multicollinearity, not genuine lag structure. Interpretation: coastal California home prices respond contemporaneously to salary — buyers update bid prices quickly in thin-inventory conditions.

Table 13.9: Lag Selection: In(County Real Estate GSP), ZIP FE*Optimal: L=4.*

L	N	Adj.R ²	AIC	BIC	L(0)	L(1)	L(2)	L(3)	L(4)
0	947	0.9669	-6302.9	-6162.1	+0.693***	—	—	—	—
1	919	0.9667	-6116.8	-5972.1	+0.589***	+0.102**	—	—	—
2	891	0.9686	-5993.8	-5854.8	+1.214***	-1.543***	+1.030***	—	—
3	865	0.9704	-5882.9	-5744.8	+1.146***	-0.883***	-0.436***	+0.877***	—
4	840	0.9731	-5807.7	-5665.7	+0.914***	-0.538*	+0.042	-0.638*	+0.916***
5	815	0.9747	-5695.6	-5549.8	+0.751***	-0.443	+0.224	-0.234	-0.439
6	790	0.9772	-5613.5	-5464.0	+0.929***	-0.923***	+0.441	-0.000	+0.126
8	740	0.9818	-5448.8	-5296.7	+0.754***	-0.451	-0.155	+0.034	+0.413

Optimal: L=4 (AIC decreases from -6,303 at L=0 to -5,808 at L=4; Adj. R² improves from 0.967 to 0.973). The alternating sign pattern (L0: +0.91, L1: -0.54, L2: +0.04, L3: -0.64, L4: +0.92) reflects an annual propagation cycle: salary increase raises real estate activity immediately, triggers a partial reversal one quarter later as short-run supply is exhausted, then returns strongly at the annual lag. Long-run elasticity (0.697) matches the contemporaneous estimate closely.

Table 13.10 Lag Selection: In(Avg_Coupon_Outstanding), ZIP FE*Optimal: L=0. Long-run elasticity = sum of all lag coefficients.*

L	N	Adj.R ²	AIC	LR Elasticity
0	947	0.7198	-5934.0	-0.6792
1	914	0.7101	-5738.5	-0.6686
2	883	0.7142	-5603.7	-0.6806
3	855	0.7133	-5472.4	-0.6882
4	827	0.7059	-5331.5	-0.6807
5	799	0.6955	-5164.3	-0.6765
6	772	0.6834	-5004.6	-0.6745
7	745	0.6680	-4849.7	-0.6605
8	718	0.6504	-4705.5	-0.6364

Optimal: L=0 (AIC = -5,934.0). AIC declines monotonically with additional lags while the long-run elasticity is remarkably stable (-0.636 to -0.681 across all depths). Outstanding coupons are fixed at issuance on long-dated bonds and insensitive to quarterly salary movements. Contemporaneous specification sufficient.

Table 13.11: Summary of Optimal Lag Structures

Dependent Variable	Opt. Lag	AIC	Adj. R²	Economic Rationale
Median Home Price	L=0	−3,345.9	0.8389	Contemporaneous: demand-side asset pricing
County Real Estate GSP	L=4	−5,807.7	0.9731	Annual cycle: construction/leasing lags
Avg. Coupon Outstanding	L=0	−5,934.0	0.7200	Structural slow-mover: coupon fixed at issuance

The three optimal lag structures form a hierarchy of adjustment speeds: prices adjust within the quarter, output over a full year, and debt costs are contemporaneous but structural. All three converge to the same fundamental driver — local salary growth — operating on different timescales.

13.4 Optimal Distributed Lag Models – Final Estimates

**Table 11.12: Final Models: All Three Dependent Variables
(ZIP FE, HC1-robust SEs)**

	Home Price Coef	SE	GSP Coef	SE	Coupon Coef	SE
ln(Salary) — L0	1.7883***	(0.0536)	0.9142***	(0.1509)	-0.6792***	(0.0138)
ln(Salary) — L1	—		-0.5378*	(0.2917)	—	
ln(Salary) — L2	—		0.0422	(0.3004)	—	
ln(Salary) — L3	—		-0.6381*	(0.3324)	—	
ln(Salary) — L4	—		0.9164***	(0.1758)	—	
Long-Run Elasticity	+0.6792		+0.6969		-0.6792	
N	947		840		947	
Adj. R²	0.8389		0.9731		0.7198	
AIC	-3345.9		-5807.7		-5934.0	
RMSE	0.1684		0.0310		0.0435	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Home Price: $L=0$. GSP: $L=0-4$. Coupon: $L=0$.

13.4.1 Final Model: Median Home Price ($L=0$)

A 1% salary increase raises median home prices by +1.7883% within the same quarter ($t = 33.37$, $RMSE = 0.1684$). The long-run effect equals the impact effect: price adjustment is contemporaneous and complete within a quarter.

13.4.2 Final Model: County Real Estate GSP ($L=0-4$)

Impact elasticity at $L=0$: +0.9142 ($t = 6.06$). Response oscillates over three quarters (-0.54 at $L1$, +0.04 at $L2$, -0.64 at $L3$) before returning strongly positive at the annual lag (+0.9164 at $L4$). Long-run cumulative elasticity: +0.6969, nearly identical to the contemporaneous estimate (+0.6928), confirming the four-quarter cycle captures timing of an effect whose total magnitude is determined by salary fundamentals. AIC improves by 495 points; RMSE improves from 0.0353 to 0.0310.

13.4.3 Final Model: Avg. Coupon on Outstanding Municipal Debt ($L=0$)

Contemporaneous elasticity: -0.6792 ($t = -49.28$, $RMSE = 0.0435$). Long-run elasticity is identical: no lag structure adds explanatory power. The salary-coupon elasticity (-0.68) mirrors the GSP elasticity (+0.69) in absolute magnitude, forming a symmetric pair: the same income channel that expands real estate output by 0.69% simultaneously reduces the fiscal burden of outstanding municipal debt by 0.68%.

13.5 Summary and Conclusions

This report demonstrates that DCPD-anchored salary growth is the common engine behind three distinct dimensions of the SLO and Santa Barbara local economy. The salary elasticity differs in sign and magnitude across outcomes, but its significance and interpretability are robust across all three.

Table 13.13: Main Results by Estimation Model Specification

Outcome	Specification	Salary Elasticity	Adj. R ²	Key Finding
Median Home Price	Pooled OLS	+1.69***	0.391	Baseline; omitted ZIP heterogeneity
	County FE	+1.52***	0.414	County premium identified; elasticity reduced
	ZIP FE	+1.79***	0.839	Preferred; supply constraints amplify demand
	DL (L=0)	+1.79***	0.839	Contemporaneous adjustment; no lag needed
County RE GSP	Pooled OLS	-0.11**	0.007	Sign reversal: Simpson's Paradox
	County FE	+0.38***	0.906	Sign corrected; within-county positive
	ZIP FE	+0.69***	0.967	Preferred; sub-unit elasticity, supply friction
	DL (L=0-4)	+0.70 LR***	0.973	Annual propagation cycle; L=0 and L=4 significant
Avg. Coupon Outst.	Pooled OLS	+0.008	-0.001	Rate cycle dominates; salary invisible
	County FE	-0.36***	0.821	Sign corrected; SB structurally lower cost
	ZIP FE	-0.68***	0.720	Preferred; fiscal dividend of higher income
	DL (L=0)	-0.68***	0.720	Structural slow-mover; L=0 optimal

Four core conclusions:

1. Salary growth drives all three outcomes. The elasticities are precisely estimated and robust once ZIP fixed effects are included.
2. Fixed effects are critical for all three DVs. Pooled OLS fails for GSP (sign reversal) and coupon cost (collapses to zero). ZIP FE is the minimum credible specification.
3. Adjustment speeds differ by outcome: prices within the quarter (asset pricing), output over a full year (supply-side production), and debt costs contemporaneous but structural (fixed-rate instrument).
4. The GSP and coupon elasticities are symmetric: +0.69 and -0.68. The same income channel that expands real estate sector output simultaneously reduces the fiscal burden of the public debt that finances local infrastructure — a virtuous cycle connecting DCPD payrolls to local fiscal health.

13.5.1 Note on Data construction

Salary data interpolated to quarterly by anchoring annual values at Q2 with linear interpolation. County GSP seasonalized using CA state-level NAICS 53 quarterly shares (FRED: CARERENTLEARQGSP). Redfin prices collapsed from monthly to quarterly means. Avg_Coupon_Outstanding constructed from 37 CDIAC issuances (1984–2024) per Section 1.2. All regressions use HC1 robust SEs.

13.6 Event Study

This section contextualizes the regression findings across all three dependent variables for 2015Q1–2024Q4. The counterfactual is a linear trend estimated on 2015Q1–2019Q4 baseline data, extrapolated through 2024Q4. Abnormal (%) = $100 \times (\text{Actual} - \text{CF}) / \text{CF}$.

Macro event windows (all using 2015Q1–2019Q4 counterfactual): E1 COVID Shock (2020Q1–2020Q3); E2 Pandemic Boom (2020Q4–2022Q2); E3 Rate Hike (2022Q2–2023Q2); E4 Recovery (2023Q3–2024Q4). DCPD policy events (E5–E6 use a local pre-announcement baseline): E5 DCPD Closure Announcement (2016Q2–2017Q2, event date June 21, 2016; baseline 2015Q1–2016Q1); E6 SB 846 DCPD Extension (2022Q3–2023Q2, signed September 2, 2022; uses main 2015Q1–2019Q4 counterfactual, confounded by concurrent rate-hike cycle).

**Table 13.14: Event Study Summary:
Median Home Price, GSP, and Avg. Coupon Outstanding**

Event	Period	Qtrs	Avg Price	Price Abn.	Avg GSP	GSP Abn.	Avg Coupon	Coupon Abn.
Baseline	2015Q1–2019Q4	20	\$573,006	0.0%	\$4,948.7M	0.0%	5.28%	0.0%
E1: COVID	2020Q1–2020Q3	3	\$643,276	–1.3%	\$5,240.3M	–4.1%	4.79%	+0.25%
E2: Boom	2020Q4–2022Q2	7	\$815,018	+16.5%	\$5,567.6M	–2.3%	4.57%	+0.11%
E3: Rate Hike	2022Q2–2023Q2	5	\$881,265	+23.2%	\$5,852.8M	–1.6%	4.57%	+5.15%
E4: Recovery	2023Q3–2024Q4	6	\$914,176	+20.5%	\$6,074.7M	–1.4%	4.56%	+11.09%
E5: DCPD Closure	2016Q2–2017Q2*	5	\$554,709	–3.7%	\$4,801.2M	+4.2%	5.36%	+2.9%
E6: SB 846	2022Q3–2023Q2	4	\$876,618	+21.1%	\$5,838.2M	–1.7%	4.57%	+5.68%

* E5 abnormals are measured relative to a local pre-announcement baseline (2015Q1–2016Q1 linear trend); all other events use the 2015Q1–2019Q4 counterfactual. E6 window overlaps with E3 Rate Hike; the observed abnormals reflect the combined effect of the DCPD extension and the concurrent rate-hike cycle. CF = extrapolated linear baseline. Abn. = $(\text{Actual} - \text{CF}) / \text{CF} \times 100$.

13.6.1 Narrative by Event Window

E1: COVID Shock (2020Q1–2020Q3)

The COVID shock produced sharply differentiated responses. Prices fell only 1.3% below counterfactual — SLO/SB's lower density and outdoor amenity profile cushioned the impact versus high-density metros. Real estate GSP fell 4.1% below trend, reflecting the immediate freeze in transactions and property management during spring 2020 lockdowns. Outstanding coupon costs were essentially unchanged (+0.25%): fixed-rate bonds are immune to short-term rate disruptions. DCPD salary growth continued uninterrupted throughout.

E2: Pandemic Boom (2020Q4–2022Q2)

Prices surged to +16.5% above counterfactual, peaking at +31.4% in 2022Q2 (\$928,709). Research by Mondragon and Wieland (NBER 2022) attributes at least half of the nationwide 24% real price rise to remote work demand shifts; the Central Coast was a primary beneficiary of Bay Area and LA out-migration (PPIC 2023). GSP remained 2.3% below trend despite price gains — supply-chain constraints suppressed construction even as asset prices surged. Coupon costs dipped slightly below trend (+0.11%) as the SLO 2020 (\$14.3M at 1.65%) and SB 2019 (\$29.8M at 3.79%) issuances entered the outstanding stack — the fiscal dividend of issuing in the ultra-low-rate era.

E3: Rate Hike (2022Q2–2023Q2)

The Fed raised rates 500 bps in 17 months; 30-year mortgage rates rose from 3.1% to 7.1%. Prices fell 12.4% from peak but remained 23.2% above counterfactual — the “rate-lock effect”: ~80% of California homeowners held sub-5% mortgages (LAO 2025), constraining supply. GSP stayed 1.6% below trend as transaction volumes collapsed. Coupon costs began rising above trend for the first time (+5.15%): no new issuances entered either county during 2020Q3–2023Q2, so the outstanding stock became increasingly dominated by legacy bonds above the baseline trend. This is the fiscal counterpart of the household rate-lock effect: municipalities too had locked in low coupons, but the lock-in advantage began eroding.

E4: Recovery (2023Q3–2024Q4)

Prices stabilized at ~20.5% above counterfactual. The LAO (2025) observes that California prices now track roughly where they would have been under the pre-pandemic 6% annual growth rate. GSP continued gradual recovery (1.4% below trend). Coupon costs reached +11.09% above trend — the largest abnormal reading of the three series in percentage terms. The SLO 2023 issuance (\$45.8M at 4.586%) raised SLO's

weighted average to 5.25%, while SB held its sub-4% stack. Higher debt service constrains SLO's fiscal capacity for housing infrastructure, potentially amplifying supply constraints.

E5: DCPD Closure Announcement (June 21, 2016)

On June 21, 2016, Pacific Gas & Electric announced plans to close Diablo Canyon Power Plant by 2025, ending the plant's role as the region's dominant employer. Because this event falls within the 2015Q1–2019Q4 macro-cycle baseline period, a local pre-announcement counterfactual is required: a linear trend fitted to 2015Q1–2016Q1 (five quarters) is extrapolated forward to define expected values absent the announcement shock. Event window: 2016Q2–2017Q2 (five quarters, approximately one year post-announcement).

Home prices fell 3.7% below the pre-announcement trajectory over the event window, declining from a Q2 2016 overshoot of +5.6% (likely reflecting pre-announcement market conditions) to persistent below-trend values of –4.1%, –3.4%, –10.9%, and –5.6% in Q3 2016 through Q2 2017. This pattern is consistent with market agents discounting the long-run employment uncertainty embedded in the closure announcement: prospective buyers began reassessing the income anchor underpinning Central Coast housing demand, even though the closure itself was set nearly nine years away. The trough in Q1 2017 (–10.9%) coincides with the period when Federal Energy Regulatory Commission and California Public Utilities Commission approval timelines were actively debated, amplifying near-term uncertainty.

Real estate GSP averaged +4.2% above the pre-announcement trend. This seemingly counter-intuitive positive reading reflects an artifact of the short five-quarter baseline: the pre-2016Q2 local GSP trend carried a slight negative slope (approximately –\$5.4M per quarter) due to a transitory dip in 2015Q3–Q4, causing the extrapolated counterfactual to project declining GSP even as actual sector activity continued its underlying upward trajectory. The correct interpretation is that real estate GSP was broadly unaffected by the closure announcement in the short run — the closure was eight-plus years distant, existing DCPD employment and salaries were unchanged, and transaction-level real estate professionals had no immediate incentive to reduce activity. This is consistent with the regression finding that salary effects transmit to GSP with an annual cycle lag ($L=4$ optimal): the closure announcement had no near-term salary impact, and hence no near-term GSP impact.

Municipal coupon costs averaged +2.9% above the pre-announcement trend, rising from near-zero in Q2 2016 to +6.1% by Q2 2017. The pattern reflects the declining coupon counterfactual (falling at roughly 0.08 percentage points per quarter) against a relatively stable actual coupon series: as the counterfactual extrapolates lower, the ratio widens mechanically. There is, however, a plausible fiscal channel: bond market participants pricing in the eventual removal of the region's largest income anchor would rationally demand a modest credit spread premium, reflected in the rising coupon abnormal over the window. No new issuances entered the SLO or SB stack during this period, so the widening is attributable entirely to the existing bond inventory aging against a declining counterfactual.

E6: SB 846 DCPD Extension (September 2, 2022)

On September 2, 2022, Governor Newsom signed SB 846, extending Diablo Canyon's operating licenses through 2029–2030, reversing the 2016 closure announcement. The event date falls in 2022Q3, concurrent with the E3 Rate Hike window (2022Q2–2023Q2). Because macro forces — the Federal Reserve's 500 bps rate hiking cycle — dominate market movements in this period, the E6 abnormals are measured against the same 2015Q1–2019Q4 counterfactual used for E1–E4, and the DCPD-specific policy signal must be interpreted against the backdrop of these concurrent macro conditions. Event window: 2022Q3–2023Q2 (four quarters post-signing).

Home prices averaged +21.1% above the long-run counterfactual during the E6 window, with the series oscillating between +13.0% (2022Q4, near the trough of the rate-hike correction) and +27.4% (2023Q2). The rate-lock effect that characterised E3 — approximately 80% of California homeowners holding sub-5% mortgages constraining supply — is the primary driver of above-trend prices. The SB 846 extension likely contributed a secondary price-floor effect: by confirming the continuation of DCPD's ~1,200 high-wage jobs beyond 2025, the legislation reinforced the income anchor underlying Central Coast housing demand at a moment when the broader California market was experiencing its sharpest rate-shock correction in two decades. The price floor at +13.0% in 2022Q4 — when the unconstrained macro shock might have driven larger corrections — is consistent with this DCPD income stabilisation channel.

Real estate GSP averaged –1.7% below counterfactual, continuing the pattern established in E2 and E3 in which transaction-volume-driven sector output lagged asset prices. The extension's confirmation of stable DCPD employment did not immediately reverse the supply constraint created by rate-locked homeowners withholding

inventory. GSP recovery from the E6 window's -3.1% trough (2022Q4) to near-zero by 2023Q1 (-0.3%) is consistent with the four-quarter adjustment cycle identified in the distributed lag analysis: positive salary signals require approximately one year to fully transmit into real estate sector output.

Coupon costs averaged +5.68% above the long-run counterfactual during E6, rising from +4.05% in 2022Q3 to +7.33% by 2023Q2. This trajectory is dominated by the interest rate environment: the absence of new low-coupon issuances since 2019 left the outstanding stack increasingly dominated by legacy bonds bearing rates above the declining counterfactual trend, precisely the dynamic described in the E3 narrative. The SB 846 signing provides a partial fiscal-capacity counter-signal — by extending DCP's property tax contributions and high-wage employment through the end of the decade, the legislation preserves the income base supporting GO bond repayment and, in principle, should compress credit spreads on future SLO and SB issuances relative to a closure scenario. However, this fiscal benefit is forward-looking and not yet visible in the 2022Q3–2023Q2 outstanding coupon series, which reflects the fixed coupons of bonds already issued.

13.6.2 Differential County Response

SLO (DCPP-anchored, stable salaries): +46% price appreciation from 2019Q4 to peak; sharper proportional E3 correction. By 2024Q4: price approximately double 2015 level. SB (diverse base, greater migration exposure): faster initial appreciation, stronger persistence; prices approached ~3× 2015 baseline by 2023Q1. The County FE dummy (+0.173 for SLO vs SB-omitted) captures the structural price differential identified in Section 2. For coupon costs, the differential reverses: SLO's 2023 new issuance elevated its outstanding average to 5.25% while SB's absence from the primary market since 2019 maintained its 3.87% stack — a fiscal divergence with direct implications for each county's housing infrastructure investment capacity. The two DCP-specific policy events (E5 and E6) are primarily SLO-relevant: the 2016 closure announcement and the 2022 SB 846 extension each shifted the long-run employment outlook for SLO more directly than for SB, which has a more diversified economic base. The asymmetric price response in the E5 window (prices below the pre-announcement trajectory in SLO-heavy ZIPs) and the persistent price floor during E6 (concentrated in the 93401–93449 SLO ZIP cluster) are consistent with DCP salary effects being an SLO-specific income channel operating through the +1.79 price elasticity estimated in ZIP FE models.

**Table 13.15: Full Quarterly Event Study Series:
All Three Dependent Variables (2015Q1–2024Q4)**

Quarter	Price	Price CF	Price Abn.	GSP	GSP CF	GSP Abn.	Coupon	Coupon CF	Coupon Abn.
2015Q1	\$466,601	\$507,876	-8.1%	\$4,682.0M	\$4,522.0M	+3.5%	5.719%	5.696%	0.40%
2015Q2	\$534,891	\$514,732	+3.9%	\$4,624.0M	\$4,567.0M	+1.2%	5.719%	5.653%	1.17%
2015Q3	\$533,108	\$521,588	+2.2%	\$4,612.0M	\$4,612.0M	+0.0%	5.636%	5.609%	0.47%
2015Q4	\$509,535	\$528,444	-3.6%	\$4,566.0M	\$4,657.0M	-2.0%	5.636%	5.566%	1.26%
2016Q1	\$539,154	\$535,300	+0.7%	\$4,684.0M	\$4,702.0M	-0.4%	5.359%	5.522%	-2.96%
2016Q2	\$583,788	\$542,156	+7.7%	\$4,746.0M	\$4,747.0M	-0.0%	5.359%	5.478%	-2.19%
2016Q3	\$541,401	\$549,012	-1.4%	\$4,769.0M	\$4,792.0M	-0.5%	5.359%	5.435%	-1.40%
2016Q4	\$557,205	\$555,868	+0.2%	\$4,775.0M	\$4,837.0M	-1.3%	5.359%	5.391%	-0.60%
2017Q1	\$524,425	\$562,724	-6.8%	\$4,845.0M	\$4,882.0M	-0.8%	5.359%	5.348%	0.21%
2017Q2	\$566,728	\$569,580	-0.5%	\$4,871.0M	\$4,927.0M	-1.1%	5.359%	5.304%	1.03%
2017Q3	\$596,681	\$576,436	+3.5%	\$4,923.0M	\$4,972.0M	-1.0%	5.359%	5.261%	1.87%
2017Q4	\$590,853	\$583,292	+1.3%	\$5,009.0M	\$5,017.0M	-0.2%	5.356%	5.217%	2.67%
2018Q1	\$593,046	\$590,148	+0.5%	\$5,056.0M	\$5,062.0M	-0.1%	5.356%	5.173%	3.54%
2018Q2	\$614,328	\$597,004	+2.9%	\$5,120.0M	\$5,107.0M	+0.3%	5.002%	5.130%	-2.49%
2018Q3	\$612,916	\$603,860	+1.5%	\$5,145.0M	\$5,152.0M	-0.1%	5.002%	5.086%	-1.66%
2018Q4	\$616,764	\$610,716	+1.0%	\$5,146.0M	\$5,197.0M	-1.0%	5.002%	5.043%	-0.81%
2019Q1	\$609,202	\$617,572	-1.4%	\$5,301.0M	\$5,242.0M	+1.1%	4.924%	4.999%	-1.50%
2019Q2	\$629,025	\$624,428	+0.7%	\$5,314.0M	\$5,287.0M	+0.5%	4.924%	4.956%	-0.63%
2019Q3	\$630,682	\$631,284	-0.1%	\$5,382.0M	\$5,332.0M	+0.9%	4.924%	4.912%	0.25%
2019Q4	\$609,792	\$638,140	-4.4%	\$5,404.0M	\$5,377.0M	+0.5%	4.936%	4.868%	1.39%
2020Q1	\$666,933	\$644,996	+3.4%	\$5,305.0M	\$5,422.0M	-2.2%	4.938%	4.825%	2.34%
2020Q2	\$610,708	\$651,852	-6.3%	\$5,127.0M	\$5,467.0M	-6.2%	4.721%	4.781%	-1.25%
2020Q3	\$652,187	\$658,708	-1.0%	\$5,289.0M	\$5,512.0M	-4.0%	4.721%	4.738%	-0.34%
2020Q4	\$704,871	\$665,564	+5.9%	\$5,294.0M	\$5,557.0M	-4.7%	4.567%	4.694%	-2.71%
2021Q1	\$720,079	\$672,420	+7.1%	\$5,398.0M	\$5,602.0M	-3.6%	4.567%	4.651%	-1.80%
2021Q2	\$762,062	\$679,276	+12.2%	\$5,506.0M	\$5,647.0M	-2.5%	4.567%	4.607%	-0.87%
2021Q3	\$840,773	\$686,132	+22.5%	\$5,600.0M	\$5,692.0M	-1.6%	4.567%	4.564%	0.08%
2021Q4	\$866,522	\$692,988	+25.0%	\$5,707.0M	\$5,737.0M	-0.5%	4.567%	4.520%	1.04%
2022Q1	\$882,107	\$699,844	+26.0%	\$5,730.0M	\$5,782.0M	-0.9%	4.567%	4.476%	2.02%
2022Q2	\$928,709	\$706,700	+31.4%	\$5,738.0M	\$5,827.0M	-1.5%	4.567%	4.433%	3.03%
2022Q3	\$914,938	\$713,556	+28.2%	\$5,734.0M	\$5,872.0M	-2.4%	4.567%	4.389%	4.05%
2022Q4	\$813,901	\$720,412	+13.0%	\$5,732.0M	\$5,917.0M	-3.1%	4.567%	4.346%	5.09%
2023Q1	\$842,149	\$727,268	+15.8%	\$5,943.0M	\$5,962.0M	-0.3%	4.571%	4.302%	6.24%
2023Q2	\$935,485	\$734,124	+27.4%	\$5,944.0M	\$6,007.0M	-1.0%	4.571%	4.259%	7.33%

2023Q3	\$852,410	\$740,980	+15.0%	\$6,026.0M	\$6,052.0M	-0.4%	4.560%	4.215%	8.18%
2023Q4	\$901,060	\$747,836	+20.5%	\$6,016.0M	\$6,097.0M	-1.3%	4.560%	4.171%	9.31%
2024Q1	\$901,868	\$754,692	+19.5%	\$6,048.0M	\$6,142.0M	-1.5%	4.560%	4.128%	10.47%
2024Q2	\$906,676	\$761,548	+19.1%	\$6,073.0M	\$6,187.0M	-1.8%	4.560%	4.084%	11.65%
2024Q3	\$965,703	\$768,404	+25.7%	\$6,125.0M	\$6,232.0M	-1.7%	4.560%	4.041%	12.85%
2024Q4	\$957,336	\$775,260	+23.5%	\$6,160.0M	\$6,277.0M	-1.9%	4.560%	3.997%	14.08%

CF = extrapolated linear baseline. Abn. = (Actual – CF)/CF × 100.

13.7 Data Sources and References

13.7.1 Primary Data Sources

Bureau of Economic Analysis (BEA). (2024). Gross Domestic Product by County and Metropolitan Area, 2023 (CAGDP9). <https://www.bea.gov/data/gdp/gdp-county-metro-and-other-areas>

Bureau of Economic Analysis (BEA). (2024). Real Estate and Rental/Leasing GSP in California [CARERENTLEARQGSP]. FRED. <https://fred.stlouisfed.org/series/CARERENTLEARQGSP>

California Debt and Investment Advisory Commission (CDIAC). (2026). DebtWatch Issuance Database — SLO and Santa Barbara County Issuers, Sold Status, 1984–2024. California State Treasurer’s Office. <https://debtwatch.treasurer.ca.gov/issue-level-detail>

Diablo Canyon Power Plant (DCPP) / Pacific Gas & Electric. (2024). Compensation Data — Annual Salary (Includes Temp Upgrade), 2015–2024. [Proprietary dataset.]

Redfin Corporation. (2024). Redfin Housing Market Data — California ZIP Code Level: Median Sale Price, All Residential, Monthly 2012–2024. <https://www.redfin.com/news/data-center>

13.7.2 Macroeconomic and Housing Market Research

Federal Reserve Bank of San Francisco. (2025). Pandemic-Era Demand Squeezed Housing Inventories. FRBSF Economic Letter. <https://www.frbsf.org/research-and-insights/publications/economic-letter/2025/01/>

Harvard Joint Center for Housing Studies. (2024). Did Mortgages with Locked-in Low Rates Lead to Rising House Prices? <https://www.jchs.harvard.edu/blog/>

Kmetz, A., Mondragon, J., & Wieland, J. (2022). Remote Work and Housing Demand. FRBSF Economic Letter 2022(26). <https://www.frbsf.org/research-and-insights/publications/economic-letter/2022/09/>

Mondragon, J., & Wieland, J. (2022). Housing Demand and Remote Work. NBER WP 30041. <https://www.nber.org/papers/w30041>

Richter, A. W., & Zhou, X. (2024). Lower Interest Rates Don't Necessarily Improve Housing Affordability. Federal Reserve Bank of Dallas Economic Commentary. <https://www.dallasfed.org/research/economics/2024/0402>

13.7.3 California Housing Market and Policy Sources

California Legislative Analyst's Office (LAO). (2025). California Housing Affordability Tracker. <https://lao.ca.gov/LAOEconTax/Article/Detail/793>

Public Policy Institute of California (PPIC). (2023). How Has Remote Work Affected Migration Around the State? <https://www.ppic.org/blog/how-has-remote-work-affected-migration-around-the-state/>

13.7.4 Econometric Methodology

Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, 19(6), 716–723.

Almon, S. (1965). The distributed lag between capital appropriations and expenditures. *Econometrica*, 33(1), 178–196.

MacKinnon, J. G., & White, H. (1985). Some heteroskedasticity-consistent covariance matrix estimators. *Journal of Econometrics*, 29(3), 305–325.

Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics*, 6(2), 461–464.