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# Prospective Closure of the Diablo Canyon Nuclear Power Plant

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## Economic Impact Assessment

Prepared for:  
The Energy Division  
California Public Utilities Commission

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# California Public Utilities Commission

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## Executive Summary

On September 26, 2016, Governor Jerry Brown signed Senate Bill (SB) 968 which adds Section 712.5 to the Public Utilities Code, requiring the California Public Utilities Commission (CPUC) to facilitate an economic impact assessment of the adverse and beneficial economic impacts, and the net economic effects, for the County of San Luis Obispo and the surrounding regions, that could occur if the [Diablo Canyon Nuclear Power Plant] were to temporarily or permanently shut down. As ordered in SB 968, the CPUC searched for an independent third party to conduct the economic impact assessment, and ultimately hired researchers at UC Berkeley for that role. This study is that economic impact assessment.

On January 16, 2018, the CPUC issued Decision (D.)18-01-022, approving Pacific Gas and Electric Company's (PG&E) proposal to retire Units 1 and 2 of the Diablo Canyon Power Plant (DCPP) by 2024 and 2025 respectively, and authorizing up to \$211.3 million for DCPP employee retention programs. On September 19, 2018, Governor Brown signed SB 1090 which approved an additional \$85 million to pay for community impact mitigation programs in the San Luis Obispo region, and another \$140.8 million for DCPP employee retention. The CPUC enacted the rate changes ordered in SB 1090 when it issued D.18-11-024 on December 7, 2018. Collectively, D.18-01-022, SB 1090, and D.18-11-024, authorized up to \$352.1 million for DCPP employee retention programs, and \$85 million for community impact mitigation programs.

Currently, DCPP, which employs about 1,500 PG&E workers, is the second largest employer in SLO and provides a large economic base to the area that could be lost with the closure of DCPP. This study is intended to help identify potential ways for state and local jurisdictions to mitigate any adverse economic impacts and plan accordingly. Economic impacts were evaluated for DCPP closure, including shutdown of operations, actions necessary to safely retire the plant and make the site eligible for alternative use, and the implementation of SB 1090 which is a special assistance measure to offset adjustment costs for the SLO community. This document presents the five main parts of this assessment: 1) general economic impact assessment; 2) local stakeholder consultation; 3) local stakeholder survey; 4) real estate market assessment; and 5) bond market assessment. The following section summarizes the approach and findings of each component.

# ES 1 - Economic and Fiscal Impact Assessments

## ES 1.1 Approach

The overall impact of DCPD closure on the SLO economy was the primary concern for those interested in this assessment, and most of our effort was devoted to this component. To estimate the local economic and fiscal effects of DCPD closure, as well as associated spending from decommissioning, D.18-01-022, and SB 1090, 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 appropriate scenarios to reflect closure and decommissioning of DCPD. In this context three component effects had to be considered:

- Positive effects to the regional economy from the associated spending of SB 1090.
- Negative effects from the loss of local income (or associated expenditures), jobs, and tax revenues when DCPD closes.
- Positive effects from the variety expenditures associated with decommissioning to ensure safe closure of the facility.

Additionally, two timing considerations had to be taken into account: 1) when the expected positive and negative impacts will occur and 2) how long they can be expected to persist. Spending associated with SB 1090 will occur *before* the closure of DCPD and thus these economic impacts should be assessed separately from the impacts upon DCPD closure.

In summary, the relevant economic scenario inputs into our model were the following:

- **Impact 1: SB1090 and D.18-01-022 – Positive Shock (Pre-Closure)**
  - \$363.4 million for employee retention and retraining.
    - \$352.1 million for retention.
      - Payments vary across 7 years.
  - \$85 million for community impact mitigation settlement.
    - \$75 million for %Essential Services Mitigation Fund+(ESMF).
      - Spent evenly across 7 years.
    - \$10 million for %Economic Development Fund+(EDF).
      - One-time payment.

- **Impact 2: DCPD Closure – Negative Shock (Post-Closure)**
  - \$226 million for payroll.
  - 1,396 local employees.
  - \$374 million in expenditures for goods and services.
  - \$26.5 million unitary property tax.
  
- **Impact 3: DCPD Decommissioning Expenditures – Positive Shock (Post-Closure)**
  - \$4.8 billion, allocated over 10 years.
    - \$1.44 billion for waste management and remediation.
    - \$1.07 billion for utilities.
    - \$959 million for construction of other new nonresidential structures.
    - \$666 million for architectural, engineering, and related services.
    - \$401 million for investigation and security services.
    - \$227 million in other categories.

## ES 1.2 Results

Our research recognizes that plant closure, decommissioning, and SB 1090 assistance will present the SLO economy with both positive and negative economic impacts. Taken together, we find that the net effect of these factors will be much smaller than previous estimates for DCPD closure. Plant closure will induce short term reductions in local employment and expenditures associated with the cessation of electricity production. This negative outcome is expected to decrease local economic activity by some \$801 million annually in San Luis Obispo County. On the other hand, DCPD will not close in a vacuum: the plant will not immediately shut down, nor will all employees immediately leave the region. Although we are not able to estimate the total number of employees expected to stay beyond active duty at the plant, we can assume our estimate sets a conservative lower bound on the expected overall negative economic impact. Furthermore, there are positive economic impacts to consider both before and after the plant closes. Before the plant closes, funding from SB 1090 will offer significant stimulus to the SLO economy, which will see aggregate economic output increase by at least \$40 million annually for the seven years preceding closure, with output rising to \$53 million when the Economic Development Fund (EDF) is capitalized. After the plant closes and the bulk of decommissioning expenditures begin, we estimate that local output can be expected to increase by roughly \$724 million. The salient macroeconomic impacts we estimate for San Luis Obispo County are summarized below:

- **Impact 1: SB1090 and D.18-01-022 – Positive Shock (Pre-Closure)**
  - Increase in economic output of \$40 million per year for seven years, with a supplemental \$13 million increase for one year when EDF funds are capitalized.
  - Increase in approximately 349 FTE jobs annually for seven years. EDF adds an additional 87 FTE jobs when funds are capitalized.
- **Impact 2: DCPD Closure – Negative Shock (Post-Closure)**
  - Decrease in economic output of \$801 million. The majority of losses occur as direct effects within the nuclear sector with a \$600 million reduction in output.
  - Decrease of approximately 2,908 FTE jobs, the majority of which are from direct employment from DCPD.
- **Impact 3: DCPD Decommissioning Expenditures – Positive Shock (Post-Closure)**
  - Increase in economic output of \$724 million per year for ten years.
  - Increase of approximately 4,938 FTE jobs annually for ten years.

Thus, our overall assessment indicates a much smaller net impact on the SLO economy, than previous estimates for DCPD closure. Previous studies have only considered the negative shocks, whereas we take account of how decommissioning expenditures will substantially offset economic losses attributable to plant closure. Assuming that decommissioning expenditures are distributed evenly across ten years, we find a net economic loss of roughly \$77 million annually. This impact is far less than previous estimates which placed losses closer to \$1 billion per year. It is also important to place the size of any DCPD impact in context of the size and growth of San Luis Obispo regional economy. Although DCPD closure will result in meaningful economic losses, overall economic growth in the region will still be positive, although perhaps at a lower rate. For example, our estimate of \$77 million reductions in economic activity correspond to approximately 0.58% of annual gross regional product, well below historical growth rates.

## **ES 2 - Local Stakeholder Consultation**

### **ES 2.1 Approach**

At the request of the CPUC, UC Berkeley engaged nine key stakeholders to discuss issues they identified as important related to the closure of DCPD. Topics considered included fiscal impacts, economic expenditure impacts, ability to adapt, and other economic and financial factors of special concern to local stakeholders on the context of DCPD closure. These discussions were conducted during two visits by the UC Berkeley team, on September 21<sup>st</sup>, 2018 and October 12<sup>th</sup>, 2018.

## ES 2.2 Results

Based on these discussions the following themes emerged:

- **Fiscal challenges for county and city managers:** The key fiscal concern is the loss of tax revenue from the unitary property tax paid by PG&E on the land and assets at DCP. SB 1090 helps alleviate some of the concern in the short-run (pre-closure) but concerns certainly remain about the fiscal gap post-closure. The concern was most pronounced for the county government although in-depth fiscal planning has already begun.
- **Local Community Expenditure Concerns:** With the DCP closure and associated loss of a number of high-income jobs, there is likely to be a reduction in discretionary spending in the surrounding community. What will be the impact on the single high-end grocer and/or the mid-tier to high-tier restaurants? Given how small the community is, there are concerns that the loss of revenue for the specialty business could have an outsized impact on it. These concerns are not just related to full-time DCP employees but to the influx of seasonal employees who come during the scheduled refueling outages. These employees typically come during the tourism offseason and are an important source of spending during the slower season.
- **Perceptions of regional variation in ability to adapt to the closure:** The average household income for San Luis Obispo County is approximately \$65,000 and the average salary for a DCP employee is approximately \$150,000. These DCP workers are quite spread out across the county in terms of where they live. There is concern in certain regions (north county in particular) that losing these residents will have a large negative expenditure effect in smaller communities. In the city of SLO, this seemed to be less of a concern because the economy is much more diversified and less reliant on these DCP employees.
- **Discussion of how to adapt the local economy post-closure:** The point was made several times that employment in the county of San Luis Obispo is largely supported by government agencies and DCP. Several stakeholders expressed concern about the loss of the high-income earners currently employed at DCP. There is a feeling that new economic development opportunities must be aggressively pursued in order to diversify the economy and attract new businesses, particularly ones that support a high-skilled labor force. 90% of Cal Poly graduates leave the area because there is no demand in the local labor market.
- **Housing crisis and affordability gap:** The affordability gap between average household income and the rising cost of housing is clearly a concern. Permitting for new residential construction can be restrictive and several stakeholders felt that this would be a critical barrier to diversifying the economy post-closure. Little concern was expressed that DCP would have any impact on the housing crisis.

Much like the rest of California, the SLO area is in a housing crisis, with rising home prices unaffordable to much of the population. There has been an influx of capital from greater Los Angeles and the Bay Area either as investments or retirees. With restrictive zoning, NIMBYism, and expensive land costs, there is limited new home construction. The city of SLO has several new developments of single-family homes, but these are in the \$700k-\$800k range and are targeted at out-of-region capital. Those who work in the service sector or government are unable to afford homes, and the closure of DCPD will not affect this. SLO county is a middle-income county with upper-middle income home prices. Therefore, although the SLO unified school district is losing an important source of tax when DCPD closes, the district is more concerned about declining student enrollment and recruiting staff than the loss of tax revenue. Given the expensive housing market and lack of high-income jobs, they have seen families leave the city, and new families hesitant (or unable to move in). Furthermore, hiring and retaining staff remains a challenge.

- **The Impact to community not reflected in economic numbers:** There was significant concern about who DCPD employees are and what they mean for the local community. DCPD employees hold head of household jobs that cannot be easily replaced with service sector or government jobs. DCPD employees are those who donate to local schools, volunteer, or serve in other leadership roles. Will the fabric of the community, especially in bedroom communities, start to disappear as the DCPD jobs leave?

## ES 3 - Local Stakeholder Survey

### ES 3.1 Approach

To ascertain local community perceptions of the economic implications of DCPD closure, we conducted an online survey of a randomized sample of SLO stakeholders. The results of this survey represent a diverse population and reflect a resilient community sentiment on SLO economic issues generally and DCPD closure in particular.

### ES 3.2 Results

DCPD closure has stimulated local policy dialog, including both programmatic initiatives spontaneous discussions in private venues and the media. While these channels have enabled important stakeholder engagement, we wanted to assess local concerns and perceptions in a more inclusive manner. To do this, we conducted an online survey of opinions across a randomized sample of SLO enterprises, non-governmental organizations (NGOs), and public institutions (including government and education).



Because of time and other resource constraints, our anonymous sample, assembled by Dunn and Bradstreet, did not include households.<sup>1</sup>

A number of salient findings emerged from this exercise, focused on overall economic sentiment and expected impacts of DCPD closure. First of all, the present survey offers relatively clear indications of general optimism regarding recent experience and expectations about SLO's local economy. There is also significant agreement about systemic sources of risk and uncertainty, especially as these relate to the cost of living. While these need to be taken seriously, they reflect broader concerns in California's more prosperous coastal communities.

For example, twice the number of SLO enterprises reported business expansion in the last 1-5 years as those who reported contraction. Majorities of all three stakeholder groups (Table ES 1) agreed with the statement that "San Luis Obispo County has a robust, vibrant economy." This optimism was tempered, however, with expressions of concern regarding growth challenges. Among the sentiment questions, all three stakeholders strongly agreed that "San Luis Obispo County suffers from a persistent 'affordability gap' between wages and housing costs." Similarly, the stakeholders all believed that housing prices were a primary culprit in this category, and probably also contributed to concerns about local recruitment ("Marketing to and attraction of job candidates is a persistent challenge in the county."). One of the most interesting sentiment questions saw answers diverge noticeably between Enterprises/NGOs on one side, and public institutions on the other: while all three groups returned majorities who accepted the assertion that "[e]conomic anchors like DCPD or CalPoly benefit the economy, but also allow county residents to be complacent about long-term challenges to promote economic growth and diversification[.]" NGOs were most prone to agree with this notion of status quo dependence, Enterprises less so, and the public sector least of all. Conversely, it might be reasonable to expect initiative for economic renewal to arise from the groups with comparable degrees of enthusiasm.

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<sup>1</sup> We strongly believe, however, that a separate household survey would be very useful, both to assess current sentiment and to support development of more inclusive transition policies.

**Table ES 1: Percent of the Sample in Agreement with Each Statement, by Stakeholder Group**

Statement	Percent in Agreement		
	Business	NGO	PubAdm
"San Luis Obispo County has a robust, vibrant economy."	50%	53%	58%
"Housing prices are having a negative impact on the local economy."	75%	87%	80%
"Marketing to and attraction of job candidates is a persistent challenge in the county."	81%	80%	72%
"Economic anchors like DCPD or CalPoly benefit the economy, but also allow county residents to be complacent about long-term challenges to promote economic growth and diversification."	71%	80%	63%
"San Luis Obispo County suffers from a persistent 'affordability gap' between wages and housing costs."	94%	93%	90%

Not only the most relevant, but perhaps the most important findings for our assessment relate to DCPD closure and the sentiments it arouses. In particular, we saw clear and significant disparities between public and private sector expectations regarding closure impacts, but remarkable agreement about what challenges are most important to overall progress for the local economy. Enterprises, NGOs, and Public Agencies generally agree on the most important SLO risks that are subject to economic uncertainty. These results, discordant expectations over shared values, make a compelling case for determined and expanded commitments to ongoing policy dialog. We already know that SLO public and private institutions are pursuing this with dedicated (SB 1090) and other funds, including the new Hourglass Project. We can only hope the evidence presented here will support more robust and constructive engagement to mobilize local institutions.

An unintended but essential benefit of DCPD closure could be a new generation of multi-stakeholder commitment to sustainable and inclusive growth across the SLO economy. Shared values will provide welcome cohesion, while discordant expectations can stimulate constructive discourse, develop more evidence, and motivate the community to improve mutual awareness. To facilitate this, our survey also sought to identify leading concerns and opinions about DCPD. These hallmark issues could be used to jump start and sustain a forward-looking dialog for community strategic planning.

## **ES 4 - Real Estate Market Assessment**

### **ES 4.1 Approach**

The impact of the DCPD closure on real estate values has been a frequently expressed concern across the spectrum of both SLO public and private stakeholders. To elucidate the significance of this risk, we made use of a newly-available database of historical housing data from Zillow. Using this highly disaggregated and timely data, we constructed a profile of the housing market in San Luis Obispo County over recent decades, using it to econometrically assess the impact of the DCPD closure announcement on local housing prices. For comparison, we also looked at the closure of San Onofre Nuclear Generating Station (SONGS) and a few other cases.

### **ES 4.2 Results**

SLO County's housing market has largely recovered from the adverse macro cycle of 2008, with local housing prices sustaining steady upward trends over the last decade. Our event study of the DCPD closure announcement effect found no statistically significant impact associated with local housing prices. Similarly, in the area around SONGS, San Diego and Orange Counties, we found no statistically significant impacts associating real estate prices with the announcement or implementation of plant closure.

## **ES 5 - Bond Market Assessment**

### **ES 5.1 Approach**

Like real estate values, fiscal sufficiency has been a frequently expressed concern in the DCPD closure policy dialog, especially by public sector stakeholders. In our detailed economic impact assessment (component 1 above), we estimated the direct, indirect, and induced revenue implications of the main DCPD closure effects and found these to be modest relative to many expectations. While all revenue categories are not equally affected, these are significantly offset by economic stimulus from decommissioning, and SB 1090 provisions.

Of perhaps even greater significance for SLO public finance, however, is the cost of capital for local public entities. In times when economic sentiments about a regional economy turn negative, bond markets usually send a clear signal by pricing such risk into higher bond rates. The effects of this on overall budgets can often be much greater than the loss of individual revenue sources. To ascertain the significance of this for SLO

and DCP, we used high frequency financial sector data to statistically assess DCP announcement effects on local bond prices.

## ES 5.2 Results

Despite applying advanced econometric tools to high quality public financial data, we were unable to identify any statistically significant announcement effect attributable to DCP closure. We take this result as indicating that financial markets do not anticipate lasting adverse impacts on the overall SLO economy.

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## **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

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## Economic Impact Assessment

### Introduction

On September 26, 2016, Governor Jerry Brown signed Senate Bill (SB) 968 which adds Section 712.5 to the Public Utilities Code, requiring the California Public Utilities Commission (CPUC) to facilitate an economic impact assessment of the adverse and beneficial economic impacts, and the net economic effects, for the County of San Luis Obispo and the surrounding regions, that could occur if the [Diablo Canyon Nuclear Power Plant] were to temporarily or permanently shut down. As ordered in SB 968, the CPUC searched for an independent third party to conduct the economic impact assessment, and ultimately hired researchers at UC Berkeley for that role. This study is that economic impact assessment.

On January 16, 2018, the CPUC issued Decision (D.)18-01-022, approving Pacific Gas and Electric Company's (PG&E) proposal to retire Units 1 and 2 of the Diablo Canyon Power Plant (DCPP) by 2024 and 2025 respectively, and authorizing up to \$211.3 million for DCPP employee retention programs. On September 19, 2018, Governor Brown signed SB 1090 which approved an additional \$85 million to pay for community impact mitigation programs in the San Luis Obispo region, and another \$140.8 million for DCPP employee retention. The CPUC enacted the rate changes ordered in SB 1090 when it issued D.18-11-024 on December 7, 2018. Collectively, D.18-01-022, SB 1090, and D.18-11-024, authorized up to \$352.1 million for DCPP employee retention programs, and \$85 million for community impact mitigation programs.

Currently, DCPP, which employs about 1,500 PG&E workers, is the second largest employer in SLO and provides a large economic base to the area that could be lost with the closure of DCPP. This study is intended to help identify potential ways for state and local jurisdictions to mitigate any adverse economic impacts and plan accordingly. Economic impacts were evaluated for DCPP closure, including shutdown of operations, actions necessary to safely retire the plant and make the site eligible for alternative use, and the implementation of SB 1090 which is a special assistance measure to offset adjustment costs for the SLO community. This document summarizes the five main parts of this assessment: 1) general economic impact assessment; 2) local stakeholder consultation; 3) local stakeholder survey; 4) real estate market assessment; and 5) bond market assessment.

# 1 General Economic Impact Assessment

## 1.1 Approach

The overall impact of DCPD closure on the SLO economy was the primary concern for those interested in this assessment, and most of our effort was devoted to this component. To estimate the local economic and fiscal effects of DCPD closure, as well as associated spending from decommissioning and SB 1090, 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 appropriate scenarios to reflect closure and decommissioning of DCPD.



## 1.2 Methods and Data

To estimate the effect of the DCPD closure and the associated decommissioning spending we utilize a variety of empirical techniques. Our primary analysis uses a regional input-output model that estimates the economy-wide effects through industry-specific changes in economic activity. Input-output models are a common tool for impact analysis and are defined by their ability to relate the interdependence of industries and households across a regional economy. Input-output models excel in their ability to not only measure direct effects, but indirect and induced effects as well through the use of multipliers.

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.

With IMPLAN, or any input-output model, the key to high-quality output estimates are accurate inputs in the model. Inputs, or events in IMPLAN nomenclature, can be thought of as exogenous shocks to the economy. These represent any direct change to the economy such as changes in specific industries from categories such as revenue, expenditures, or employment. As one industry changes, IMPLAN provides estimates for changes in every other sector in the economy across the study area. Thus, IMPLAN results are completely dependent on accurate inputs.

Our primary objective is to identify the appropriate shock to the regional economy from the closure and decommissioning of DCPD. There are three primary effects we must consider. First, are the positive effects to the regional economy from the associated spending of D.18-01-022 and SB 1090. Second, are the negative effects from the loss of revenue (or associated expenditures), jobs, and taxes when DCPD closes. Third, are the positive effects from the variety of associated expenditures from decommissioning that ensure the plant can be closed safely.

Starting first with spending associated with D.18-01-022 and SB 1090 there are several expenditure categories that will have positive effects for the regional economy. First, D.18-01-022 and SB 1090 earmark approximately \$363.4 million for employee retention and retraining. Of this sum, the vast majority, up to \$350 million, will be used for



employee retention in which eligible employees will receive a 25% increase to their base salary until plant closure. This effect is a pure stimulus to the regional economy as current DCPD employees who elect to remain until closure will receive additional compensation for the same work. In addition to employee retention and retraining, SB 1090 also designates \$85 million for community impact mitigation settlement. Of this, \$75 million is designated for the Essential Services Mitigation Fund (ESMF), which is intended to help local jurisdictions offset the anticipated property tax losses from DCPD. The remaining \$10 million is for the Economic Development Fund (EDF), a one-time payment intended to spur economic development and mitigate anticipated economic impacts from plant closure.

The second set of effects we must consider are the negative economic impacts from closing the plant. Upon the closure of DCPD there will be three immediate impacts to the local economy. First, will be the loss of jobs and the associated spending these jobs produce. As of December 2017, DCPD employs 1,396 local employees with a payroll of approximately \$226 million. Second, are the annual expenditures the plant makes in order to operate. From 2008 - 2011 (the most recent years data has been provided), DCPD spent an average of \$374 million on goods and services, with approximately \$18 million spent locally. Third, is the loss of tax revenue from both the loss of the Unitary Property Tax on DCPD as well as additional taxes generated from employees, vendors, and general spending. The most significant of these categories is the Unitary Tax with an annual tax burden of approximately \$26.5 million.

Previous work has considered the loss of revenue from electricity sales as another potential economic impact, but we argue that expenditures and payroll represent a more accurate measure. In the absence of expenditure and payroll information, revenue might be a useful category. However, revenues are used for expenditures and payroll. Thus, profits would be of more interest, but given that PG&E is a statewide IOU remaining profits from DCPD do not stay entirely within the region. Absent data on local profits, expenditures and payroll are preferred as the local impact can be calculated. Furthermore, revenue (and profits) will simply be reallocated across the California economy as PG&E must replace the lost electricity generated.

The third and final set of effects are the positive economic impacts associated with safely decommissioning DCPD. Decommissioning estimates from PG&E were released in mid-December 2018 (see PG&E application to the CPUC, A.18-12-008), after our preliminary analysis was completed. Our analysis assumes a spending pattern similar to the decommissioning of SONGS and builds on the Beacon (2017) report, which categorized some \$3.3 billion in decommissioning spending across a broad array of services and products. We assume the same distribution of spending across categories but increase overall expenditures to \$4.8 billion to match PG&E's current estimate.

However, previous PG&E estimates have not been granted full approval by the CPUC: in the previous round of decommissioning estimates in 2015, PG&E requested \$4 billion but the CPUC only approved \$2.7 billion. The annex includes results for the most recently approved amount of \$2.7 billion, as well as a \$6 billion upper bound estimate.

We model waste management and remediation services as the overall largest spending category, comprising approximately 31% of all decommissioning expenditures. Utilities represent the next largest with 22% of total spending, followed by construction and removal of structures (20%), architecture, engineering, and related services (14%), and investigation and security services (8%). Expenditures in all other categories represent less than 1.5% of total spending and include categories such as marketing, telecommunication support, and heavy machine rental among others.

Before moving to our results, we must discuss timing. There are two timing considerations worth noting; when the expected impacts will occur and for how long. Spending associated with D.18-01-022 and SB 1090 will occur *before* the closure of DCPD and thus these economic impacts should be assessed separately from the impacts upon DCPD closure. Additionally, D.18-01-022 and SB 1090 spending will be issued at slightly different intervals. The majority of the spending will be distributed across seven years until plant closure. Retention payments will be issued in two tiers, but for simplicity we assume they are distributed evenly across seven years. The ESMF funds will be distributed annually in seven equal and consecutive payments of \$8.3 million. The EDF funds are a one-time distribution. While the exact timing of how the EDF funds are spent will not be known until they are issued, San Luis Obispo County has indicated that they plan to spend these funds immediately upon receipt, and thus we assume they will be exhausted in one year. To help simplify these timing considerations to allow more meaningful interpretation, we assume the SB 1090 funds will be split evenly over 7 years, with a one-year boost in the first year from the EDF funds.

The next set of impacts occur *after* the closure of DCPD. These include the negative economic impacts associated with closing the plant from the loss of jobs, expenditures, and tax base. These also include the positive economic impacts from decommissioning expenditures. These impacts will occur concurrently for a length of time and thus correctly modeling the timing of the decommissioning expenditures is important to gauge the size of the overall effect. While the economic losses from the plant closure will persist in perpetuity, the long-term impacts are less clear given the uncertainty surrounding the long-term plans for the site. Furthermore, the San Luis Obispo regional economy is dynamic and simply extending multiplier effects in perpetuity is an inaccurate assumption. As new industries enter the region, the interrelationship between industries (and between industries and households) will undoubtedly change.

Therefore, we argue that the most important economic impacts to consider are those that occur immediately after plant closure, when decommissioning expenditures are present and will offset the economic losses from the plant closure. Again, to help simplify timing considerations to allow meaningful interpretation we assume total decommissioning expenditures will be split evenly across 10 years.

### 1.3 Results

Below we present our results for the IMPLAN analysis. Results are presented in three parts. First, are the positive economic impacts associated with SB1090, which will occur before DCPD closes. Second, are the negative economic impacts from the loss of employment and plant expenditures from the closure of DCPD. This effect occurs after the closure of the plant. Third, are the positive economic impacts from the decommissioning expenditures needed to safely bring the power plant offline. These also occur after the closure of the plant. Results are presented for San Luis Obispo County, Santa Barbara County, and the Rest of California.

For each section, results are presented for the top ten impacted economic sectors for both economic output and employment. These sectors come from the 528 IMPLAN sectors and are self-explanatory with a few exceptions. One obscure sector that is common throughout our results is %Owner-Occupied Dwellings.+ This sector estimates the homeownership industry by capturing expenses associated with homeownership such as repair and maintenance, mortgage payments, and other expenditures related to home upkeep.

We use the 2016 version of IMPLAN, which is the most recent version available at the time of our analysis. Therefore, we present results in 2016 dollars to limit assumptions surrounding inflation. Employment estimates are for Full Time Equivalent (FTE) positions, which means one employee working full time.

#### 1.3.1 SB 1090: ESMF and Retention

SB 1090 is comprised of many different spending packages to help offset the economic losses from closing DCPD. As previously discussed, this spending will occur across different time intervals. Specifically, retention payments and spending from the ESMF will be spread across seven years, while spending from the EDF will be a one-time payment. Therefore, we report results separately as retention/ESMF and EDF.

Starting first with the ESMF and retention plan we present results for San Luis Obispo County, Santa Barbara County, and the Rest of California in Tables 1 - 9. Given that spending will be concentrated almost entirely within San Luis Obispo County, it comes

as no surprise that the largest effects are seen here. In Table 1, total output is estimated at roughly \$40.1 million per year for seven years. The largest impacted sectors are spread across those affected from retention payments (e.g. homeownership and real estate, restaurants, medical) and the ESMF (e.g. employment in government and education).

Regarding job creation, we find modest impacts for San Luis Obispo County. Table 2 suggests that the ESMF is responsible for increases in direct employment in government and education sectors, while retention payments see increases in induced employment in sectors associated with increased consumer spending. Overall, the ESMF and retention payments are expected to create roughly 350 FTE jobs annually across 7 years. For state and local tax impacts, Table 3 reveals that sales, property, and income will be the largest categories with annual contributions of \$1, \$0.9, and \$0.5 million respectively. The total tax benefit from the ESMF and retention payments is estimated at \$2.8 million annually for 7 years.

Similar results for Santa Barbara are presented in Tables 4 - 6. Given that Santa Barbara is primarily affected through the increased payment to DCPD employees from the retention plan, there are no direct effects seen for output or job creation. The primary impacts here come from increased salaries through retention which lead to induced effects in sectors reliant on consumer spending. In total, some \$4.3 million in annual output is forecasted for seven years in Santa Barbara (Table 4). For employment and taxes, we find minimal impacts. Increased spending from retention payments will result in an increase of approximately 30 FTE jobs (Table 5). Tax revenue will increase by some \$280 thousand being driven by sales, property, and income taxes (Table 6).

Much like Santa Barbara County, the rest of California also has no direct impacts and sees minimal impacts (Tables 7 - 9). The primary impacts of the ESMF and retention plan result in increased output and jobs that are local in nature and do not require intermediary inputs (i.e. government and service sector). Therefore, impacts to the rest of California are primarily induced as dollars spent locally recirculate within California before leaking out to other states or countries. Although overall impacts in the rest of California are larger than Santa Barbara County at \$7 million (Table 7), this impact is virtually zero when compared to the overall size of the rest of California's economy (IMPLAN estimates the gross regional product at ~ \$2.5 trillion in 2016). Similarly, approximately 35 FTE jobs are forecasted in Table 8, but this will barely register when compared with the 22 million jobs in the rest of California. Increases to tax revenues are minimal as well with an expected annual impact of \$84 thousand as seen in Table 9.

It should be noted that homes of departing households will be reappraised upon resale, and if they were long term residents this could lead to significant tax increases from

reassessments even if current house prices remain stable. We estimated this potential effect on local revenues to be negligible, however.

**Table 1: Total Annual Economic Impact of SB 1090 ESMF and DCPD Employee Retention, San Luis Obispo County, (2016 Dollars Annually for 7 Years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$9,002,092	\$451,957	\$31,525,141	\$40,979,190
1	Owner-occupied dwellings	\$0	\$0	\$5,286,105	\$5,286,105
2	Real estate	\$126,977	\$60,762	\$2,748,843	\$2,936,582
3	Employment and payroll of local govt, education	\$2,925,822	\$0	\$0	\$2,925,822
4	Employment and payroll of state govt, non-education	\$1,720,857	\$0	\$0	\$1,720,857
5	Employment and payroll of state govt, education	\$1,431,373	\$0	\$0	\$1,431,373
6	Limited-service restaurants	\$71,771	\$4,542	\$1,295,293	\$1,371,606
7	Hospitals	\$0	\$0	\$1,322,672	\$1,322,672
8	Wholesale trade	\$64,232	\$25,019	\$1,187,537	\$1,276,789
9	Employment and payroll of local govt, non-education	\$1,214,311	\$0	\$0	\$1,214,311
10	Offices of physicians	\$1,113	\$0	\$1,202,331	\$1,203,444
	Total all other categories	\$1,445,637	\$361,633	\$18,482,359	\$20,289,630

**Table 2: FTE Jobs from SB 1090 ESMF and DCPD Retention, San Luis Obispo County (Annually for 7 Years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	96.26	3.47	249.33	349.06
1	Employment and payroll of local govt, education	34.52	0.00	0.00	34.52
2	Employment and payroll of state govt, education	21.45	0.00	0.00	21.45
3	Real estate	0.81	0.39	17.42	18.62
4	Full-service restaurants	0.30	0.12	15.45	15.87
5	Employment and payroll of state govt, non-education	15.66	0.00	0.00	15.66
6	Limited-service restaurants	0.76	0.05	13.76	14.57
7	Employment and payroll of local govt, non-education	11.46	0.00	0.00	11.46
8	Individual and family services	0.09	0.00	9.06	9.15
9	Offices of physicians	0.01	0.00	8.63	8.64
10	Retail - Food and beverage stores	0.00	0.00	7.78	7.78
	Total all other categories	11.21	2.92	177.21	191.34

**Table 3: State and Local Tax Impact of SB 1090 ESMF and DCPD Retention, San Luis Obispo County, (2016 Dollars Annually for 7 Years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
<b>Dividends</b>	\$0	\$0	\$0	\$0	\$4,253
<b>Social Ins Tax- Employee Contribution</b>	\$28,014	\$0	\$0	\$0	\$0
<b>Social Ins Tax- Employer Contribution</b>	\$58,683	\$0	\$0	\$0	\$0
<b>TOPI: Sales Tax</b>	\$0	\$0	\$1,014,740	\$0	\$0
<b>TOPI: Property Tax</b>	\$0	\$0	\$900,867	\$0	\$0
<b>TOPI: Vehicle License</b>	\$0	\$0	\$19,677	\$0	\$0
<b>TOPI: Severance Tax</b>	\$0	\$0	\$928	\$0	\$0
<b>TOPI: Other Taxes</b>	\$0	\$0	\$91,610	\$0	\$0
<b>TOPI: S/L NonTaxes</b>	\$0	\$0	\$12,048	\$0	\$0
<b>Corporate Profits Tax</b>	\$0	\$0	\$0	\$0	\$75,844
<b>Personal Income Tax</b>	\$0	\$0	\$0	\$521,616	\$0
<b>Personal Tax: NonTaxes</b>	\$0	\$0	\$0	\$72,611	\$0
<b>Personal Tax: Vehicle License</b>	\$0	\$0	\$0	\$17,997	\$0
<b>Personal Tax: Property Taxes</b>	\$0	\$0	\$0	\$8,032	\$0
<b>Personal Tax: Other Tax (Fish/Hunt)</b>	\$0	\$0	\$0	\$3,536	\$0
<b>Total State and Local Tax</b>	\$86,697	\$0	\$2,039,872	\$623,793	\$80,097

**Table 4: Total Annual Economic Impact of SB 1090 ESMF and DCPD Employee Retention, Santa Barbara County (2016 Dollars Annually for 7 Years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$77,198	\$4,259,754	\$4,336,953
<b>1</b>	Owner-occupied dwellings	\$0	\$0	\$528,277	\$528,277
<b>2</b>	Real estate	\$0	\$8,492	\$443,844	\$452,336
<b>3</b>	Hospitals	\$0	\$0	\$217,587	\$217,587
<b>4</b>	Wholesale trade	\$0	\$9,067	\$205,476	\$214,545
<b>5</b>	Other local government enterprises	\$0	\$4,289	\$159,908	\$164,197
<b>6</b>	Offices of physicians	\$0	\$0	\$136,818	\$136,818
<b>7</b>	Limited-service restaurants	\$0	\$351	\$133,206	\$133,559
<b>8</b>	Monetary authorities and depository credit intermediation	\$0	\$730	\$96,952	\$97,682
<b>9</b>	Other financial investment activities	\$0	\$450	\$87,596	\$88,046
<b>10</b>	Full-service restaurants	\$0	\$194	\$82,399	\$82,593
	Total all other categories	\$0	\$53,623	\$2,167,691	\$2,221,314

**Table 5: FTE Jobs from SB 1090 ESMF and DCPD Retention, in Santa Barbara County (Annually for 7 Years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	0.40	29.38	29.78
1	Real estate	0.00	0.04	2.11	2.15
2	Full-service restaurants	0.00	0.00	1.41	1.41
3	Limited-service restaurants	0.00	0.00	1.36	1.36
4	Hospitals	0.00	0.00	1.13	1.13
5	Wholesale trade	0.00	0.04	0.85	0.89
6	Offices of physicians	0.00	0.00	0.87	0.87
7	Services to buildings	0.00	0.01	0.78	0.80
8	Individual and family services	0.00	0.00	0.80	0.80
9	Retail - Food and beverage stores	0.00	0.00	0.75	0.75
10	Retail - General merchandise stores	0.00	0.00	0.67	0.67
	Total all other categories	0.00	0.30	18.66	18.96

**Table 6: State and Local Tax Impact of SB 1090 ESMF and DCPD Retention, Santa Barbara County, (2016 Dollars Annually for 7 Years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$477
Social Ins Tax- Employee Contribution	\$2,233	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$4,679	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$97,799	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$94,362	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$2,299	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$108	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$13,172	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$1,319	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$8,234
Personal Income Tax	\$0	\$0	\$0	\$46,844	\$0
Personal Tax: NonTaxes (Fines- Fees	\$0	\$0	\$0	\$6,562	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$1,610	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$642	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$319	\$0
Total State and Local Tax	\$6,911	\$0	\$209,061	\$55,975	\$8,711

**Table 7: Total Annual Economic Impact of SB 1090 ESMF and DCPD Employee Retention, Rest of California (2016 Dollars Annually for 7 Years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$286,160	\$6,263,058	\$6,549,218
<b>1</b>	Management of companies and enterprises	\$0	\$20,584	\$418,830	\$439,416
<b>2</b>	Employment services	\$0	\$27,024	\$354,637	\$381,662
<b>3</b>	Other financial investment activities	\$0	\$5,242	\$369,936	\$375,178
<b>4</b>	Wholesale trade	\$0	\$13,031	\$243,888	\$256,920
<b>5</b>	Real estate	\$0	\$6,107	\$230,718	\$236,826
<b>6</b>	Non-depository credit intermediation and related activities	\$0	\$4,614	\$189,247	\$193,863
<b>7</b>	Owner-occupied dwellings	\$0	\$0	\$181,380	\$181,380
<b>8</b>	Legal services	\$0	\$6,606	\$170,150	\$176,756
<b>9</b>	Wireless telecommunications carriers (except satellite)	\$0	\$9,411	\$158,682	\$168,093
<b>10</b>	Internet publishing and broadcasting and web search portals	\$0	\$9,625	\$155,173	\$164,799
	Total all other categories	\$0	\$183,912	\$3,790,414	\$3,974,327

**Table 8: FTE Jobs from SB1090 ESMF and DCPD Retention, Rest of California (Annually for 7 Years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	1.44	34.01	35.45
<b>1</b>	Employment services	0.00	0.32	4.29	4.63
<b>2</b>	Other financial investment activities	0.00	0.03	1.92	1.95
<b>3</b>	Management of companies and enterprises	0.00	0.08	1.57	1.65
<b>4</b>	Warehousing and storage	0.00	0.04	1.39	1.44
<b>5</b>	Wholesale trade	0.00	0.05	0.98	1.03
<b>6</b>	Non-depository credit intermediation and related activities	0.00	0.03	0.99	1.02
<b>7</b>	Investigation and security services	0.00	0.05	0.91	0.96
<b>8</b>	Real estate	0.00	0.03	0.85	0.86
<b>9</b>	Legal services	0.00	0.03	0.80	0.84
<b>10</b>	Full-service restaurants	0.00	0.01	0.73	0.75
	Total all other categories	0.00	0.77	19.57	20.34



**Table 9: State and Local Tax Impact of SB 1090 ESMF and DCPD Retention, Rest of California, (2016 Dollars Annually for 7 Years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$189
Social Ins Tax- Employee Contribution	\$827	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$1,731	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$27,028	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$25,074	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$630	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$30	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$3,739	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$469	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$3,298
Personal Income Tax	\$0	\$0	\$0	\$17,304	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	\$2,557	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$594	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$228	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$117	\$0
Total State and Local Tax	\$2,556	\$0	\$56,970	\$20,800	\$3,487

### 1.3.2 SB1090: EDF

The other main component of SB 1090 funds is the EDF, which is comprised of a one-time \$10 million payment of intended to spur economic development in San Luis Obispo County. Although direct spending will be concentrated entirely in San Luis Obispo County, we present results for indirect and induced effects for Santa Barbara County and the rest of California for completeness. Results are presented below in Tables 10 - 18.

Starting first with San Luis Obispo County, we find in Table 10 that the EDF will increase output by approximately \$13 million. Note that the primary affected sectors are those most associated with economic development and lean heavily towards construction. This is in contrast to the ESMF whose goal is to retain essential services. Furthermore, multiplier effects are not as strong since we see less changes in household expenditures due to the lack of the increased salary payments in higher-income brackets from the retention payments. In regard to employment, Table 11 finds similar trends for output with a higher concentration of direct effects in construction sectors. In total, we find the EDF will increase employment by 87 jobs. Finally, Table 12

considers the state and local tax impact. We find that the EDF will contribute roughly \$500,000 in additional tax revenue.

Turning to Santa Barbara County and the Rest of California, we find minimal effects, which is no surprise given that funds will be spent entirely within San Luis Obispo County. Santa Barbara will see approximately \$400,000 in increased output, 2.4 new jobs, and \$33,000 more state and local tax (Tables 13 - 15 respectively). For the rest of California, effects are comparatively larger than Santa Barbara but overall insignificant given the size of the regional economy (Tables 16 - 18).

**Table 10: Total Annual Economic Impact of SB 1090 EDF, San Luis Obispo County (2016 Dollars for 1 year)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$8,383,264	\$2,167,208	\$2,282,487	\$12,832,959
<b>1</b>	Construction of other new nonresidential structures	\$2,564,013	\$0	\$0	\$2,564,013
<b>2</b>	Construction of new multifamily residential structures	\$2,412,037	\$0	\$0	\$2,412,037
<b>3</b>	Construction of new highways and streets	\$1,937,773	\$0	\$0	\$1,937,773
<b>4</b>	Wholesale trade	\$99,104	\$261,138	\$85,837	\$446,079
<b>5</b>	Owner-occupied dwellings	\$0	\$0	\$389,069	\$389,069
<b>6</b>	Real estate	\$0	\$164,723	\$195,886	\$360,609
<b>7</b>	Scientific research and development services	\$225,946	\$6,196	\$1,051	\$233,193
<b>8</b>	Custom computer programming services	\$217,014	\$584	\$281	\$217,879
<b>9</b>	Construction of new commercial structures, including farm structures	\$213,590	\$0	\$0	\$213,590
<b>10</b>	Architectural, engineering, and related services	\$0	\$177,559	\$11,961	\$189,520
	Total all other categories	\$713,786	\$1,557,008	\$1,598,403	\$3,869,198

**Table 11: FTE Jobs from SB 1090 EDF, San Luis Obispo County (1 year)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	53.43	15.37	18.07	86.88
1	Construction of other new nonresidential structures	18.55	0.00	0.00	18.55
2	Construction of new multifamily residential structures	14.69	0.00	0.00	14.69
3	Construction of new highways and streets	11.40	0.00	0.00	11.40
4	Real estate	0.00	1.04	1.24	2.29
5	Wholesale trade	0.49	1.30	0.43	2.21
6	Construction of new commercial structures, including farm structures	1.63	0.00	0.00	1.63
7	Custom computer programming services	1.40	0.00	0.00	1.40
8	Full-service restaurants	0.00	0.23	1.12	1.35
9	Architectural, engineering, and related services	0.00	1.24	0.08	1.32
10	Construction of new power and communication structures	1.24	0.00	0.00	1.24
	Total all other categories	4.03	11.55	15.20	30.78

**Table 12: State and Local Tax Impact of SB 1090 EDF, San Luis Obispo County (2016 Dollars for 1 Year)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends					\$1,010
Social Ins Tax- Employee Contribution	\$6,265				
Social Ins Tax- Employer Contribution	\$13,124				
TOPI: Sales Tax			\$179,373		
TOPI: Property Tax			\$159,244		
TOPI: Vehicle License			\$3,478		
TOPI: Severance Tax			\$164		
TOPI: Other Taxes			\$16,194		
TOPI: S/L NonTaxes			\$2,130		
Corporate Profits Tax					\$18,003
Personal Income Tax				\$139,436	
Personal Tax: NonTaxes (Fines- Fees)				\$19,410	
Personal Tax: Vehicle License				\$4,811	
Personal Tax: Property Taxes				\$2,147	
Personal Tax: Other Tax (Fish/Hunt)				\$945	
Total State and Local Tax	\$19,389		\$360,583	\$166,750	\$19,013

**Table 13: Total Annual Economic Impact of SB 1090 EDF, Santa Barbara County  
(2016 Dollars for 1 year)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$281,726	\$135,929	\$417,656
1	Wholesale trade	\$0	\$92,289	\$8,903	\$101,193
2	Real estate	\$0	\$26,619	\$20,280	\$46,899
3	Other local government enterprises	\$0	\$10,087	\$6,265	\$16,353
4	Commercial and industrial machinery and equipment rental and leasing	\$0	\$12,771	\$571	\$13,343
5	Owner-occupied dwellings	\$0	\$0	\$10,826	\$10,826
6	Extraction of natural gas and crude petroleum	\$0	\$8,972	\$1,557	\$10,529
7	Office administrative services	\$0	\$6,609	\$1,850	\$8,459
8	Cable and other subscription programming	\$0	\$3,709	\$3,754	\$7,462
9	Lessors of nonfinancial intangible assets	\$0	\$5,332	\$1,963	\$7,295
10	Non-depository credit intermediation and related activities	\$0	\$2,934	\$3,466	\$6,400
	Total all other categories	\$0	\$112,404	\$76,493	\$188,897

**Table 14: FTE Jobs from SB 1090 EDF, Santa Barbara County (per year)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	1.49	0.90	2.39
1	Wholesale trade	0.00	0.38	0.04	0.42
2	Real estate	0.00	0.13	0.10	0.22
3	Office administrative services	0.00	0.08	0.02	0.10
4	Employment services	0.00	0.05	0.02	0.07
5	Marketing research and all other miscellaneous professional, scientific, and technical services	0.00	0.05	0.01	0.07
6	Accounting, tax preparation, bookkeeping, and payroll services	0.00	0.04	0.02	0.06
7	Services to buildings	0.00	0.03	0.03	0.06
8	Other local government enterprises	0.00	0.03	0.02	0.05
9	Full-service restaurants	0.00	0.01	0.03	0.04
10	Legal services	0.00	0.03	0.01	0.04
	Total all other categories	0.00	0.67	0.60	1.26

**Table 15: State and Local Tax Impact of SB 1090 EDF, Santa Barbara County  
(2016 Dollars for 1 Year)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends					\$42
Social Ins Tax- Employee Contribution	\$217				
Social Ins Tax- Employer Contribution	\$454				
TOPI: Sales Tax			\$12,098		
TOPI: Property Tax			\$11,672		
TOPI: Vehicle License			\$284		
TOPI: Severance Tax			\$13		
TOPI: Other Taxes			\$1,629		
TOPI: S/L NonTaxes			\$163		
Corporate Profits Tax					\$731
Personal Income Tax				\$4,542	
Personal Tax: NonTaxes (Fines- Fees)				\$636	
Personal Tax: Vehicle License				\$156	
Personal Tax: Property Taxes				\$62	
Personal Tax: Other Tax (Fish/Hunt)				\$31	
<b>Total State and Local Tax</b>	<b>\$671</b>		<b>\$25,861</b>	<b>\$5,428</b>	<b>\$773</b>

**Table 16: Total Annual Economic Impact of SB 1090 EDF, Rest of California (2016 Dollars for 1 year)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$1,735,238	\$905,863	\$2,641,101
<b>1</b>	Wholesale trade	\$0	\$127,858	\$38,458	\$166,316
<b>2</b>	Management of companies and enterprises	\$0	\$80,339	\$35,941	\$116,281
<b>3</b>	Employment services	\$0	\$75,088	\$28,405	\$103,493
<b>4</b>	Truck transportation	\$0	\$73,861	\$10,615	\$84,476
<b>5</b>	Petroleum refineries	\$0	\$72,416	\$10,129	\$82,545
<b>6</b>	Real estate	\$0	\$29,053	\$47,592	\$76,645
<b>7</b>	Owner-occupied dwellings	\$0	\$0	\$65,401	\$65,401
<b>8</b>	Other concrete product manufacturing	\$0	\$61,931	\$372	\$62,303
<b>9</b>	Legal services	\$0	\$31,837	\$17,812	\$49,649
<b>10</b>	Wireless telecommunications carriers (except satellite)	\$0	\$28,943	\$20,517	\$49,459
	Total all other categories	\$0	\$1,153,912	\$630,622	\$1,784,534

**Table 17: FTE Jobs from SB 1090 EDF, Rest of California (2016 Dollars for 1 year)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	7.66	5.31	12.97
1	Employment services	0.00	0.91	0.34	1.25
2	Wholesale trade	0.00	0.51	0.15	0.67
3	Truck transportation	0.00	0.45	0.06	0.51
4	Management of companies and enterprises	0.00	0.30	0.14	0.44
5	Warehousing and storage	0.00	0.21	0.11	0.32
6	Real estate	0.00	0.11	0.17	0.28
7	Other concrete product manufacturing	0.00	0.27	0.00	0.27
8	Full-service restaurants	0.00	0.06	0.20	0.26
9	Other financial investment activities	0.00	0.06	0.19	0.25
10	Investigation and security services	0.00	0.16	0.08	0.24
	Total all other categories	0.00	4.62	3.85	8.47

**Table 18: State and Local Tax Impact of SB 1090 EDF, Rest of California (2016 Dollars for 1 Year)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends					\$292
Social Ins Tax- Employee Contribution	\$1,470				
Social Ins Tax- Employer Contribution	\$3,079				
TOPI: Sales Tax			\$38,971		
TOPI: Property Tax			\$32,033		
TOPI: Vehicle License			\$884		
TOPI: Severance Tax			\$42		
TOPI: Other Taxes			\$5,801		
TOPI: S/L NonTaxes			\$1,103		
Corporate Profits Tax					\$5,262
Personal Income Tax				\$28,312	
Personal Tax: NonTaxes (Fines- Fees)				\$4,669	
Personal Tax: Vehicle License				\$970	
Personal Tax: Property Taxes				\$341	
Personal Tax: Other Tax (Fish/Hunt)				\$192	
Total State and Local Tax	\$4,549		\$78,834	\$34,484	\$5,555

### 1.3.3 DCPD Closure

This section considers the negative economic impacts associated with the closure of DCPD. As previously mentioned, negative economic impacts will occur through three primary inputs: the loss of the approximately 1,396 jobs and payroll of \$226 million, the loss of roughly \$374 million in expenditures on intermediary goods and services to operate DCPD, and the loss of the \$26.5 million foregone in unitary property tax revenue.

Before moving to the discussion of the results, it should be noted that these results represent the extreme upper bound when DCPD is completely decommissioned. There will of course be a ramping down of employment, payroll, and expenditures during the decommissioning phase, but we were unable to model these interim effects without detailed inputs from PG&E. Specifically, we would need a timeline for each of the inputs in order to accurately model the impacts. For example, our results include the direct loss of 1,396 jobs when the plant closes. There will of course be a period of time when current DCPD employees are retained that operate concurrently with the decommissioning estimates below. During this time period the effects will be below what we forecast here. However, our objective is to provide estimates on the overall impact, which is what our results present here. These results should be considered as the upper bound scenario, providing the necessary benchmark to compare to the overall decommissioning expenditures.

Results for the closure of DCPD are reported for San Luis Obispo County, Santa Barbara County, and the Rest of California below in Tables 19 - 27. Starting first with San Luis Obispo County, we find that the closure of DCPD will result in a reduction of some \$800 million in output, the majority of which is concentrated in direct effects in the nuclear sector (Table 19). These direct effects total a loss of approximately \$600 million in output and are comprised of the two direct inputs: \$226 million in payroll and \$374 million in expenditures.

Given that the only direct effects will occur in the nuclear sector, the next largest categories are those affected by the indirect and induced effects. Once again, we see a similar trend where reductions in payroll will reduce household expenditures and impact associated sectors such as homeownership, real-estate, restaurants, and healthcare. These sectors are represented by comparatively larger induced impacts. There are also sectors affected by the decrease in expenditures such as petroleum refineries, wholesale trade, and maintenance. These sectors experience comparatively larger indirect impacts as they are affected through the operations of DCPD rather than changes to household expenditures.

Moving to employment in San Luis Obispo County, we find that the closure of DCPD will result in the loss of approximately 3,000 jobs, the majority of which come directly from DCPD (Table 20). Sectors that indirectly support DCPD will see a loss in employment and include marketing, maintenance, and wholesale trade. There will be induced job losses as well from the reduction in household expenditures in sectors that are most affected by discretionary spending.

The tax impact for San Luis Obispo County is presented in Table 21. The overall largest loss will be the \$31 million reduction in property tax, both from the Unitary Tax of DCPD as well as additional property taxes paid by DCPD employees and vendors. Taken together, the closure of DCPD will reduce payments to state and local taxes by approximately \$40 million annually.

For Santa Barbara County, the economic impacts will be significantly less and largely concentrated as induced effects. Table 22 shows that total output will reduce by \$22 million, \$19 million coming from induced effects. These large induced impacts reflect reduced household expenditures from payroll reductions of local employees rather than reductions in expenditures from DCPD. Although some expenditures of goods and services for DCPD come from Santa Barbara County, this finding suggests that DCPD vendors are primarily located in San Luis Obispo County, elsewhere in California, or outside the state.

Employment in Santa Barbara County follows a similar pattern as seen in Table 23. We find that approximately 150 jobs will be lost upon the closure of DCPD, largely concentrated as induced impacts from sectors most affected by reduced household expenditures. These include real estate, health care, and other sectors affected by discretionary spending such as restaurants and retail.

Taxes in Santa Barbara County will be minimally affected compared to San Luis Obispo County. The primary impacts are once again driven by reduced employee payroll and include property, sales, and income tax of DCPD employees. In total, tax revenue will decrease by \$1.4 million annually (Table 24).

Results for the rest of California are presented in Tables 25- 27. Once again, impacts are split between indirect and induced. As PG&E purchases more goods and services from the rest of California for the operation of DCPD, we see larger indirect effects here than for Santa Barbara County. Impacts to the rest of California are concentrated in different sectors than both San Luis Obispo and Santa Barbara Counties as there are limited impacts to sectors that are characterized by local spending. The total economic impact to California is the loss of approximately \$40 million in output and 200 jobs, which is a very insignificant impact compared to the overall size of the state economy. Lost tax revenue is also minimal.



**Table 19: Total Economic Impact of DCPD Closure, San Luis Obispo County (2016 Dollars Annually)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>			-	
		-\$600,868,412	-\$66,081,131	\$133,868,350	-\$800,817,893
1	Electric power generation - Nuclear	-\$600,868,412	-\$2	-\$7	-\$600,868,421
2	Owner-occupied dwellings	\$0	\$0	-\$22,475,912	-\$22,475,912
3	Real estate	\$0	-\$3,964,211	-\$11,656,948	-\$15,621,158
4	Petroleum refineries	\$0	-\$10,900,382	-\$1,268,488	-\$12,168,870
5	Wholesale trade	\$0	-\$3,120,947	-\$5,041,909	-\$8,162,856
6	Monetary authorities and depository credit intermediation	\$0	-\$4,000,325	-\$3,835,274	-\$7,835,599
7	Maintenance and repair construction of nonresidential structures	\$0	-\$6,789,003	-\$900,588	-\$7,689,591
8	Full-service restaurants	\$0	-\$2,340,982	-\$3,549,049	-\$5,890,031
9	Limited-service restaurants	\$0	-\$364,132	-\$5,500,576	-\$5,864,708
10	Hospitals	\$0	\$0	-\$5,607,787	-\$5,607,787
	Total all other categories	\$0	-\$34,601,148	-\$74,031,810	-\$108,632,959

**Table 20: FTE Jobs from DCPD Closure, San Luis Obispo County (Annually)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	-1,396.00	-452.82	-1,058.83	-2,907.65
1	Electric power generation - Nuclear	-1,396.00	0.00	0.00	-1,396.00
2	Full-service restaurants	0.00	-43.29	-65.63	-108.93
3	Real estate	0.00	-25.13	-73.88	-99.01
4	Marketing research and all other miscellaneous professional, scientific, and technical services	0.00	-85.27	-4.00	-89.27
5	Limited-service restaurants	0.00	-3.87	-58.43	-62.29
6	Maintenance and repair construction of nonresidential structures	0.00	-43.55	-5.78	-49.33
7	Wholesale trade	0.00	-15.48	-25.01	-40.50
8	Individual and family services	0.00	0.00	-38.53	-38.53
9	Offices of physicians	0.00	0.00	-36.63	-36.63
10	Retail - Food and beverage stores	0.00	-0.18	-33.05	-33.23
	Total all other categories	0.00	-236.05	-717.88	-953.93

**Table 21: State and Local Tax Impact of DCPD Closure, San Luis Obispo County, (2016 Dollars)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	-\$22,003
Social Ins Tax- Employee Contribution	-\$87,807	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	-\$183,930	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	-\$5,195,359	\$0	\$0
TOPI: Property Tax	\$0	\$0	-\$31,163,249	\$0	\$0
TOPI: Vehicle License	\$0	\$0	-\$100,743	\$0	\$0
TOPI: Severance Tax	\$0	\$0	-\$4,753	\$0	\$0
TOPI: Other Taxes	\$0	\$0	-\$469,036	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	-\$61,692	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	-\$392,364
Personal Income Tax	\$0	\$0	\$0	-\$1,901,009	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	-\$264,628	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	-\$65,593	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	-\$29,272	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	-\$12,886	\$0
<b>Total State and Local Tax</b>	<b>-\$271,737</b>	<b>\$0</b>	<b>-\$36,994,832</b>	<b>-\$2,273,387</b>	<b>-\$414,367</b>

**Table 22: Total Economic Impact of DCPD Closure, Santa Barbara County (2016 Dollars Annually)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	-\$2,582,362	-\$19,399,083	-\$21,981,445
<b>1</b>	Owner-occupied dwellings	\$0	\$0	-\$2,446,104	-\$2,446,104
<b>2</b>	Real estate	\$0	-\$244,769	-\$1,984,151	-\$2,228,919
<b>3</b>	Wholesale trade	\$0	-\$262,633	-\$918,372	-\$1,181,005
<b>4</b>	Hospitals	\$0	\$0	-\$1,008,564	-\$1,008,564
<b>5</b>	Other local government enterprises	\$0	-\$195,725	-\$716,430	-\$912,155
<b>6</b>	Extraction of natural gas and crude petroleum	\$0	-\$573,840	-\$114,467	-\$688,307
<b>7</b>	Offices of physicians	\$0	\$0	-\$633,898	-\$633,898
<b>8</b>	Limited-service restaurants	\$0	-\$10,512	-\$615,734	-\$626,245
<b>9</b>	Monetary authorities and depository credit intermediation	\$0	-\$25,768	-\$442,582	-\$468,350
<b>10</b>	Other financial investment activities	\$0	-\$21,012	-\$399,638	-\$420,650
	Total all other categories	\$0	-\$1,248,103	-\$10,119,146	-\$11,367,248

**Table 23: FTE Jobs from DCPD Closure, Santa Barbara County (Annually)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	-13.14	-134.22	-147.36
1	Real estate	0.00	-1.16	-9.42	-10.58
2	Full-service restaurants	0.00	-0.10	-6.54	-6.64
3	Limited-service restaurants	0.00	-0.11	-6.27	-6.38
4	Hospitals	0.00	0.00	-5.24	-5.24
5	Wholesale trade	0.00	-1.08	-3.78	-4.86
6	Offices of physicians	0.00	0.00	-4.04	-4.04
7	Services to buildings	0.00	-0.30	-3.57	-3.88
8	Individual and family services	0.00	0.00	-3.69	-3.69
9	Retail - Food and beverage stores	0.00	0.00	-3.45	-3.45
10	Retail - General merchandise stores	0.00	0.00	-3.07	-3.08
	Total all other categories	0.00	-10.38	-85.14	-95.52

**Table 24: State and Local Tax Impact of DCPD Closure, Santa Barbara County, (2016 Dollars)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	-\$2,413
Social Ins Tax- Employee Contribution	-\$11,554	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	-\$24,202	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	-\$490,052	\$0	\$0
TOPI: Property Tax	\$0	\$0	-\$472,831	\$0	\$0
TOPI: Vehicle License	\$0	\$0	-\$11,519	\$0	\$0
TOPI: Severance Tax	\$0	\$0	-\$546	\$0	\$0
TOPI: Other Taxes	\$0	\$0	-\$66,007	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	-\$6,611	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	-\$41,649
Personal Income Tax	\$0	\$0	\$0	-\$240,115	\$0
Personal Tax: NonTaxes (Fines- Fees	\$0	\$0	\$0	-\$33,635	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	-\$8,254	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	-\$3,291	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	-\$1,632	\$0
Total State and Local Tax	-\$35,756	\$0	-\$1,047,563	-\$286,927	-\$44,062

**Table 25: Total Economic Impact of DCPD Closure, Rest of California (2016 Dollars Annually)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	-\$9,044,158	-\$29,411,008	-\$38,455,166
1	Management of companies and enterprises	\$0	-\$685,834	-\$1,820,650	-\$2,506,485
2	Employment services	\$0	-\$716,452	-\$1,537,654	-\$2,254,106
3	Other financial investment activities	\$0	-\$347,922	-\$1,643,965	-\$1,991,887
4	Wholesale trade	\$0	-\$378,161	-\$1,168,020	-\$1,546,181
5	Real estate	\$0	-\$208,595	-\$1,160,453	-\$1,369,049
6	Owner-occupied dwellings	\$0	\$0	-\$1,065,659	-\$1,065,659
7	Internet publishing and broadcasting and web search portals	\$0	-\$357,160	-\$684,233	-\$1,041,394
8	Non-depository credit intermediation and related activities	\$0	-\$173,955	-\$840,224	-\$1,014,178
9	Wireless telecommunications carriers (except satellite)	\$0	-\$263,816	-\$733,431	-\$997,247
10	Legal services	\$0	-\$213,210	-\$761,966	-\$975,177
	Total all other categories	\$0	-\$5,699,052	-\$17,994,752	-\$23,693,804

**Table 26: FTE Jobs from DCPD Closure, Rest of California (Annually)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	-46.00	-161.78	-207.78
1	Employment services	0.00	-8.68	-18.62	-27.30
2	Other financial investment activities	0.00	-1.81	-8.54	-10.34
3	Management of companies and enterprises	0.00	-2.58	-6.85	-9.42
4	Warehousing and storage	0.00	-2.00	-6.04	-8.04
5	Wholesale trade	0.00	-1.52	-4.70	-6.22
6	Investigation and security services	0.00	-1.55	-3.99	-5.54
7	Non-depository credit intermediation and related activities	0.00	-0.91	-4.40	-5.31
8	Real estate	0.00	-0.76	-4.24	-5.01
9	Legal services	0.00	-1.01	-3.60	-4.60
10	Full-service restaurants	0.00	-0.40	-3.95	-4.35
	Total all other categories	0.00	-24.78	-96.85	-121.65

**Table 27: State and Local Tax Impact of DCPD Closure, Rest of California, (2016 Dollars)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	-\$2,413
Social Ins Tax- Employee Contribution	-\$11,554	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	-\$24,202	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	-\$490,052	\$0	\$0
TOPI: Property Tax	\$0	\$0	-\$472,831	\$0	\$0
TOPI: Vehicle License	\$0	\$0	-\$11,519	\$0	\$0
TOPI: Severance Tax	\$0	\$0	-\$546	\$0	\$0
TOPI: Other Taxes	\$0	\$0	-\$66,007	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	-\$6,611	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	-\$41,649
Personal Income Tax	\$0	\$0	\$0	-\$240,115	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	-\$33,635	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	-\$8,254	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	-\$3,291	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	-\$1,632	\$0
Total State and Local Tax	-\$35,756	\$0	-\$1,047,563	-\$286,927	-\$44,062

#### 1.3.4 DCPD Decommissioning Expenditures

This section presents results for the economic impacts of decommissioning expenditures associated with the closure of DCPD for San Luis Obispo County, Santa Barbara County, and the Rest of California in Tables 28-36. These results should be compared to results from the following section as economic impacts will occur concurrently for a period of time. These estimates represent the currently requested amount of \$4.8 billion from PG&E. Tables in the annex present results for both the approved funds (\$2.8 billion) as well as an upper bound (\$6 billion).

Once again starting first with San Luis Obispo County where the majority of impacts will occur, we find that decommissioning expenditures will produce over \$724 million in annual output as seen in Table 28. Note that these expenditures assume the entire amount of decommissioning expenditures will be split evenly across 10 years and will be concentrated within the county (as opposed to hiring employees from out of the region or state). We see that the sectors most impacted by the decommissioning expenditures are those associated the largest direct inputs. We also see that for every

\$2 spent in decommissioning expenditures an additional \$1 are created through the multiplier effects.

In regard to employment, we find in Table 29

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$279,666,412	\$70,121,376	\$72,444,947	\$422,232,735
1	Waste management and remediation services	\$85,894,608	\$7,754,986	\$268,300	\$93,917,893
2	Construction of other new nonresidential structures	\$55,982,893	\$0	\$0	\$55,982,893
3	Electric power generation - Nuclear	\$54,997,340	\$11	\$9	\$54,997,359
4	Architectural, engineering, and related services	\$38,593,554	\$5,426,593	\$379,240	\$44,399,387
5	Investigation and security services	\$23,411,028	\$148,458	\$57,739	\$23,617,225
6	Real estate	\$906,675	\$6,375,528	\$6,256,216	\$13,538,418
7	Owner-occupied dwellings	\$0	\$0	\$12,272,361	\$12,272,361
8	Wholesale trade	\$2,814,113	\$4,371,878	\$2,726,302	\$9,912,294
9	Natural gas distribution	\$4,057,131	\$160,115	\$176,064	\$4,393,310
10	Petroleum refineries	\$0	\$3,610,986	\$681,253	\$4,292,239
	Total all other categories	\$13,009,070	\$42,272,822	\$49,627,464	\$104,909,356

Table A - 69 that decommissioning expenditures will produce approximately 4,940 jobs annually for 10 years. Much like output, the majority of the jobs will be concentrated as direct employment as a result of decommissioning expenditures and track closely with the respective level of inputs in each sector. It is also worth noting that although decommissioning expenditures will increase employment more than the closure of DCPD will decrease employment, we find that this is not consistent with output. This can be explained by the types of jobs lost and gained. Decommissioning expenditures will support more low-wage workers than DCPD, which is characterized by its high-wage workforce. Therefore, although more jobs will be produced in decommissioning than are lost in the closure of DCPD, we find that output increases less than it falls from the closure of DCPD.

We present results for the impact for state and local tax in Table 30. We find that decommissioning expenditures will have a significant tax benefit, most of which comes from sales, property, and income taxes. In total, decommissioning expenditures are projected to increase the tax base by \$45.5 million dollars annually. This completely offsets the lost taxes from the closure of DCPD, which includes the loss of the Unitary Property Tax.

Turning to impacts outside of San Luis Obispo, we find comparatively smaller impacts for Santa Barbara County and the rest of California. Since we assume decommissioning

expenditures will be spent entirely within San Luis Obispo County, we only find indirect and induced effects outside the county. For Santa Barbara County, we find the majority of effects are indirect; in other words the primary economic impacts will be from supplying the decommissioning efforts. There are induced effects as well due to leakages from spending and the changes in household expenditures from the indirect effects. In total, output will increase by approximately \$24 million and employment by 147 jobs (Tables 31 and 32 respectively). We find minimal tax impacts in Table 33, with an overall increase of approximately \$1.4 million.

The rest of California sees a comparatively larger effect for decommissioning expenditures than it does for the closure of DCP. This can be explained by a larger amount of intermediary goods and services needed outside the region to decommission DCP than are required to operate the plant. We find that decommissioning expenditures will increase output in California by approximately \$132 million, add 690 jobs, and increase tax revenue by \$6.2 million (Tables 34, 35, and 36 respectively). Again, these totals are very small compared to the overall size of the regional economy and should be considered in context.

**Table 28: Total Economic Impact of Requested DCP Decommissioning Expenditures, San Luis Obispo County (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$479,428,135	\$120,208,073	\$124,191,337	\$723,827,545
1	Waste management and remediation services	\$147,247,900	\$13,294,261	\$459,942	\$161,002,103
2	Construction of other new nonresidential structures	\$95,970,673	\$0	\$0	\$95,970,673
3	Electric power generation - Nuclear	\$94,281,154	\$18	\$16	\$94,281,187
4	Architectural, engineering, and related services	\$66,160,379	\$9,302,730	\$650,125	\$76,113,234
5	Investigation and security services	\$40,133,191	\$254,500	\$98,981	\$40,486,672
6	Real estate	\$1,554,300	\$10,929,476	\$10,724,941	\$23,208,716
7	Owner-occupied dwellings	\$0	\$0	\$21,038,333	\$21,038,333
8	Wholesale trade	\$4,824,194	\$7,494,648	\$4,673,660	\$16,992,504
9	Natural gas distribution	\$6,955,082	\$274,482	\$301,824	\$7,531,388
10	Petroleum refineries	\$0	\$6,190,262	\$1,167,862	\$7,358,124
	Total all other categories	\$22,301,262	\$72,467,694	\$85,075,652	\$179,844,610

**Table 29: Total FTE Jobs from Requested DCP Decommissioning Expenditures, San Luis Obispo County (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	3,041.96	912.88	982.98	4,937.83

1	Investigation and security services	1,001.98	6.35	2.47	1,010.80
2	Waste management and remediation services	654.91	59.12	2.04	716.08
3	Construction of other new nonresidential structures	694.34	0.00	0.00	694.34
4	Architectural, engineering, and related services	462.22	64.99	4.54	531.76
5	Real estate	9.85	69.28	67.98	147.10
6	Full-service restaurants	0.00	55.68	60.94	116.62
7	Wholesale trade	23.94	37.19	23.18	84.30
8	Electric power generation - Nuclear	78.56	0.00	0.00	78.56
9	Limited-service restaurants	0.00	15.29	54.25	69.54
10	Environmental and other technical consulting services	41.76	22.00	2.30	66.05
	Total all other categories	74.42	583.00	765.28	1,422.70

**Table 30: State and Local Tax Impact of Requested DCPD Decommissioning Expenditures, San Luis Obispo County (2016 Dollars Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$62,635
Social Ins Tax- Employee Contribution	\$382,764	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$801,781	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$17,030,987	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$15,119,796	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$330,247	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$15,582	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$1,537,556	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$202,232	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$1,116,949
Personal Income Tax	\$0	\$0	\$0	\$7,491,474	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	\$1,042,844	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$258,487	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$115,355	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$50,780	\$0
Total State and Local Tax	\$1,184,545	\$0	\$34,236,401	\$8,958,940	\$1,179,586





**Table 31: Total Economic Impact of Requested DCPD Decommissioning Expenditures, Santa Barbara County (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$16,556,170	\$7,728,746	\$24,284,916
1	Wholesale trade	\$0	\$2,690,456	\$496,057	\$3,186,514
2	Real estate	\$0	\$1,674,052	\$1,129,914	\$2,803,966
3	Other local government enterprises	\$0	\$2,073,551	\$349,412	\$2,422,964
4	Scenic and sightseeing transportation and support activities for transportation	\$0	\$894,372	\$89,626	\$983,998
5	Office administrative services	\$0	\$655,213	\$101,508	\$756,721
6	Lessors of nonfinancial intangible assets	\$0	\$645,244	\$107,545	\$752,788
7	Extraction of natural gas and crude petroleum	\$0	\$582,384	\$85,625	\$668,008
8	Owner-occupied dwellings	\$0	\$0	\$639,917	\$639,917
9	Marketing research and all other miscellaneous professional, scientific, and technical services	\$0	\$442,262	\$46,854	\$489,116
10	Cable and other subscription programming	\$0	\$261,497	\$206,776	\$468,271
	Total all other categories	\$0	\$6,637,140	\$4,475,514	\$11,112,653

**Table 32: Total Jobs from Requested DCPD Decommissioning Expenditures, Santa Barbara County (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	95.52	51.20	146.74
1	Real estate	0.00	7.94	5.36	13.31
2	Wholesale trade	0.00	11.08	2.04	13.12
3	Office administrative services	0.00	7.56	1.18	8.74
4	Marketing research and all other miscellaneous professional, scientific, and technical services	0.00	6.90	0.73	7.63
5	Other local government enterprises	0.00	6.12	1.03	7.14
6	Scenic and sightseeing transportation and support activities for transportation	0.00	5.56	0.55	6.11
7	Employment services	0.00	4.45	1.07	5.53
8	Accounting, tax preparation, bookkeeping, and payroll services	0.00	3.82	0.97	4.80
9	Services to buildings	0.00	2.06	1.62	3.68
10	Full-service restaurants	0.00	0.98	1.88	2.88
	Total all other categories	0.00	39.04	34.75	73.80

**Table 33: State and Local Tax Impact of Requested DCPD Decommissioning Expenditures, Santa Barbara County (2016 Dollars Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$2,438
Social Ins Tax- Employee Contribution	\$12,670	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$26,540	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$453,714	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$437,770	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$10,664	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$505	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$61,112	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$6,121	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$42,077
Personal Income Tax	\$0	\$0	\$0	\$268,768	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	\$37,648	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$9,239	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$3,683	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$1,828	\$0
<b>Total State and Local Tax</b>	<b>\$39,210</b>	<b>\$0</b>	<b>\$969,886</b>	<b>\$321,166</b>	<b>\$44,515</b>

**Table 34: Total Economic Impact of Requested DCPD Decommissioning Expenditures, Rest of California (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$82,831,010	\$48,868,417	\$131,699,428
<b>1</b>	Employment services	\$0	\$7,589,992	\$1,546,670	\$9,136,662
<b>2</b>	Management of companies and enterprises	\$0	\$5,619,848	\$1,951,956	\$7,571,803
<b>3</b>	Wholesale trade	\$0	\$4,071,128	\$2,072,608	\$6,143,735
<b>4</b>	Real estate	\$0	\$1,616,756	\$2,559,731	\$4,176,487
<b>5</b>	Petroleum refineries	\$0	\$2,993,887	\$547,313	\$3,541,200
<b>6</b>	Owner-occupied dwellings	\$0	\$0	\$3,505,008	\$3,505,008
<b>7</b>	Wireless telecommunications carriers (except satellite)	\$0	\$2,332,012	\$1,108,472	\$3,440,484
<b>8</b>	Other basic inorganic chemical manufacturing	\$0	\$3,329,423	\$13,469	\$3,342,892
<b>9</b>	Legal services	\$0	\$2,131,314	\$964,210	\$3,095,524
<b>10</b>	Internet publishing and broadcasting and web search portals	\$0	\$2,121,264	\$818,546	\$2,939,810
	Total all other categories	\$0	\$51,025,387	\$33,780,436	\$84,805,822

**Table 35: Total FTE Jobs from Requested DCPD Decommissioning Expenditures, Rest of California (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	404.12	286.22	690.35
1	Employment services	0.00	91.92	18.73	110.65
2	Management of companies and enterprises	0.00	21.13	7.34	28.46
3	Wholesale trade	0.00	16.38	8.34	24.72
4	Investigation and security services	0.00	13.00	4.28	17.28
5	Warehousing and storage	0.00	9.48	6.08	15.55
6	Real estate	0.00	5.92	9.36	15.26
7	Other financial investment activities	0.00	4.30	10.36	14.64
8	Legal services	0.00	10.06	4.55	14.62
9	Full-service restaurants	0.00	3.55	10.74	14.30
10	Truck transportation	0.00	9.26	3.47	12.73
	Total all other categories	0.00	219.14	202.98	422.11

**Table 36: State and Local Tax Impact of Requested DCPD Decommissioning Expenditures, Rest of California (Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$15,323
Social Ins Tax- Employee Contribution	\$79,112	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$165,716	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$1,891,418	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$1,554,648	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$42,922	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$2,040	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$281,564	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$53,516	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$275,726
Personal Income Tax	\$0	\$0	\$0	\$1,517,028	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	\$250,156	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$51,984	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$18,264	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$10,300	\$0
Total State and Local Tax	\$244,829	\$0	\$3,826,110	\$1,847,731	\$291,049

### 1.3.5 Discussion

Our results demonstrate that the closure of DCPD and related decommissioning will present both positive and negative economic impacts. On one hand, the closure of

DCPP will see the loss of employment and expenditures associated with the plant and this negative outcome is expected to decrease output by some \$820 million annually in San Luis Obispo and Santa Barbara Counties. This finding is in line with previous work that has estimated that DCPP is responsible for \$920 million in local output (Mayeda and Riener 2013).

On the other hand, DCPP will not close in a vacuum. The plant will not immediately shut down, with all employees immediately leaving the region. Although we are unable to estimate the total number of employees who are expected to stay, we can assume our estimate presents the upper bound of what the overall negative economic impact will be. Furthermore, there are positive economic impacts to consider both before and after the plant closes. Before the plant closes there is funding from SB1090 and D.18-01-022, which will see output increase by at least \$40 million for the nine years proceeding closure, with output rising to \$53 million when the EDF is capitalized. After the plant closes and the bulk of decommissioning expenditures begin, we find an expected increase in local output of roughly \$724 million. In other words, upon closure the net effect will be a roughly \$77 million decrease in output annually.

There are some caveats with our findings. First, our assumption around the timing of decommissioning funds drives the overall size of the effect. That is, if we assume a shorter timeline or a longer timeline our effect would either increase or decrease respectively.<sup>2</sup> Second, we should note that the negative economic impacts from plant closure will exist in perpetuity while the decommissioning expenditures are finite.

Despite these caveats, our findings provide a useful benchmark in gauging the overall size of the impact. While previous work has only highlighted either the negative or positive impacts of nuclear plant closure and decommissioning, our study is the first analysis to incorporate both negative and positive effects. This is important as taken together, the loss of approximately \$77 million is far less than the nearly \$1 billion as estimated previously (Mayeda and Riener 2013).

Comparing the size of this effect to both San Luis Obispo's regional economy and growth is important to ascertain how meaningful the closure of DCPP will be for the community. The 2016 gross regional product of San Luis Obispo was approximately \$13.3 billion dollars, meaning the net impact could see economic growth fall by roughly 0.58%. For further context, the San Luis Obispo MSA grew on average by a rate of 4.5% from 2001 to 2017, meaning overall economic growth in the region will still be positive, albeit at a lower rate (BEA 2018).

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<sup>2</sup> We could also assume a non-linear effect, which is more likely to reflect how actual funds will be utilized. As previously mentioned we assume a linear effect to allow more useful comparison of net effects.

Turning to Santa Barbara County, we largely find that the closure of DCPD will have a limited net effect. This intuitively makes sense as only 132 employees are located in Santa Barbara county and the primary effects will be through impacts to household expenditures. Although no direct SB1090 funds or decommissioning expenditures will be spent in Santa Barbara County, there will be indirect and induced effects through suppliers and spending leakages. Therefore, while closure of DCPD will result in a reduction in output of some \$22 million annually, we find the decommissioning expenditures will increase output by approximately the same size (\$24 million). Even disregarding the decommissioning expenditures, the loss of \$22 million in output is relatively insignificant given the size of Santa Barbara County's economy: in 2016 the gross regional product was approximately \$25 billion meaning the closure of DCPD will decrease gross regional product by less than 0.1%.

For the rest of California, the overall size of the effect will be even smaller and for all intents and purposes can be considered as having no effect. We find that the closure of DCPD will decrease output by \$38 million annually, while decommissioning expenditures will increase output by \$132 million. While the overall impact might be net positive for a period of time, this difference is trivial given the size of the rest of California's economy estimated at \$2.5 trillion in 2016. Therefore, even a net gain in output of \$94 million would represent only 0.004% of gross regional product.

## 1.4 Conclusions

Generally, we find that the closure of DCPD and related decommissioning will present both positive and negative direct impacts to the SLO economy. On one hand, the closure of DCPD will see the loss of employment and expenditures associated with the plant and this negative outcome is expected to decrease economic activity by some \$801 million annually in San Luis Obispo County.

On the other hand, DCPD will not close in a vacuum. The plant will not immediately shut down, with all employees immediately leaving the region. Although we are not able to estimate the total number of employees who can be expected to stay, we can assume our estimate presents a most conservative bound on what the overall negative economic impact will be. Furthermore, there are positive economic impacts to consider both before and after the plant closes. Before the plant closes, there is funding from SB 1090 and D.18-01-022, which will see output increase by at least \$40 million for the seven years preceding closure, with output rising to \$53 million when the Economic Development Fund (EDF) is capitalized. After the plant closes and the bulk of decommissioning expenditures begin, we estimate that local output can be expected to increase by roughly \$724 million. Our main macroeconomic impacts are summarized below for San Luis Obispo County.

- **Impact 1: SB1090 and D.18-01-022 – Positive Shock (Pre-Closure)**
  - Increase in economic output of \$40 million per year for seven years, with a supplemental \$13 million increase for one year when EDF funds are capitalized.
  - Increase in approximately 349 FTE jobs annually for seven years. EDF adds an additional 87 FTE jobs when funds are capitalized.
- **Impact 2: DCPD Closure – Negative Shock (Post-Closure)**
  - Decrease in economic output of \$801 million. The majority of losses occur as direct effects within the nuclear sector with a \$600 million reduction in output.
  - Decrease of approximately 2,908 FTE jobs, the majority of which are from direct employment from DCPD.
- **Impact 3: DCPD Decommissioning Expenditures – Positive Shock (Post-Closure)**
  - Increase in economic output of \$724 million per year for ten years.
  - Increase of approximately 4,938 FTE jobs annually for ten years.

Our research finds a much smaller net effect than previous estimates for DCPD closure. Whereas previous studies have only considered the negative impacts, we also consider how decommissioning expenditures will offset some of the negative economic losses when the plant closes. Assuming that decommissioning expenditures are distributed evenly across ten years, we find a net economic loss of roughly \$77 million annually. This impact is far less than previous estimates which have placed losses in the range of \$1 billion, or 13 times our estimate. It is also important to place the size of any DCPD impact in context with the size San Luis Obispo's regional economy and growth. Although the closure will result in meaningful economic losses, overall economic growth in the region will still be positive, although perhaps at a lower rate: losses of \$77 million in net economic activity correspond to approximately 0.58% of gross regional product, well below historical growth rates.



## 2 Local Stakeholder Consultation

### 2.1 Approach

At the request of CPUC, UC Berkeley engaged nine key stakeholders to discuss issues they identified as important related to the closure of DCP. Topics considered included fiscal impacts, economic expenditure impacts, ability to adapt, and other economic and financial factors of special concern to local stakeholders in the context of DCP closure. These discussions were conducted during two visits by the UC Berkeley team, on September 21<sup>st</sup>, 2018 and October 12<sup>th</sup>, 2018.

The following individuals and organizations were interviewed:

- Andrea Lueker, Harbor Manager, Port of San Luis
- Melissa James, SLO Chamber of Commerce
- Loreli Cappel and Mike Manchak, Economic Vitality Corporation
- Wade Horton, County Administrative Officer, San Luis Obispo County
- Derek Johnson, City Manager, City of San Luis Obispo
- Rachelle Rickard, City Manager, City of Atascadero
- James Lewis, City Manager, City of Pismo Beach
- David Weisman and Rochelle Becker, Alliance for Nuclear Responsibility
- Eric Prater and Ryan Pinkerton, Superintendent, San Luis Unified School District



## 2.2 Results

Six leading themes emerged from our discussions. Each of these would be good candidates for more dedicated policy research and dialog.

### 2.2.1 Fiscal challenges for county and city managers:

The key fiscal concern is the loss of tax revenue from the unitary property tax paid by PG&E on the land and assets at DCP. SB 1090 helps alleviate some of the concern in the short-run (pre-closure) but concerns remain about the fiscal gap post-closure. The concern was most pronounced for the county government although in-depth fiscal planning has already begun.

### 2.2.2 Local Community Expenditure Concerns:

With the DCP closure and associated loss of a number of high-income jobs, there is likely to be a reduction in discretionary spending in the surrounding community. What will be the impact on the single high-end grocer and/or the mid- to high-tier restaurants? Given how small the community is, there are concerns that the loss of revenue for the specialty business could have an outsized impact on the community. These concerns are not just related to full-time DCP employees but to the influx of seasonal employees who come during refueling outages. These employees typically come during the tourism offseason and are an important source of spending during that time.

### 2.2.3 Perceptions of regional variation in ability to adapt to the closure:

The average household income for San Luis Obispo county is approximately \$65,000 and the average salary for a DCP employee is approximately \$150,000. These DCP workers are quite spread out across the county in terms of where they live. There is concern in certain regions (north county in particular) that losing these residents will have a large negative expenditure effect in smaller communities. In the city of SLO, this seemed to be less of a concern because the economy is much more diversified and less reliant on these DCP employees.

### 2.2.4 Discussion of how to adapt the local economy post-closure:

The point was made several times that employment in the county of San Luis Obispo is largely supported by government agencies and DCP. Several stakeholders expressed concern about the loss of high-income earners currently employed at DCP. There is a feeling that new economic development opportunities must be aggressively pursued in order to diversify the economy and attract new businesses, particularly ones that

support a high-skilled labor force. 90% of Cal Poly graduates leave the area because there is no demand in the local labor market.

#### 2.2.5 Housing crisis and affordability gap:

The affordability gap between average household income and the rising cost of housing is clearly a concern. Permitting for new residential construction can be restrictive and several stakeholders felt that this would be a critical barrier to diversifying the economy post-closure. Little concern was expressed that DCPD would have any impact on the housing crisis. Much like the rest of California, the SLO area is in a housing crisis, with rising home prices unaffordable to much of the population. There has been an influx of capital from greater Los Angeles and the Bay Area as either investments or retirees. With restrictive zoning, NIMBYism, and expensive land costs, there is limited new home construction. The city of SLO has several new developments of single-family homes, but these are in the \$700k-\$800k range and are targeted at out-of-region capital. Those who work in the service sector or government are unable to afford homes, and the closure of DCPD will not affect this. SLO county is a middle-income county with upper-middle income home prices. Therefore, although the SLO unified school district is losing an important source of tax when DCPD closes, the district is more concerned about declining student enrollment and recruiting staff than the loss of tax revenue. Given the expensive housing market and lack of high-income jobs, they have seen families leave the city, and new families hesitant (or unable to move in). Furthermore, hiring and retaining staff remains a challenge.

#### 2.2.6 The Impact to community not reflected in economic numbers:

There was significant concern about who DCPD employees are and what they mean for the local community. DCPD employees hold head of household jobs that cannot be easily replaced with service sector or government jobs. DCPD employees are those who donate to local schools, volunteer, or serve in other leadership roles. Will the fabric of the community, especially in bedroom communities, start to disappear as the DCPD jobs leave?

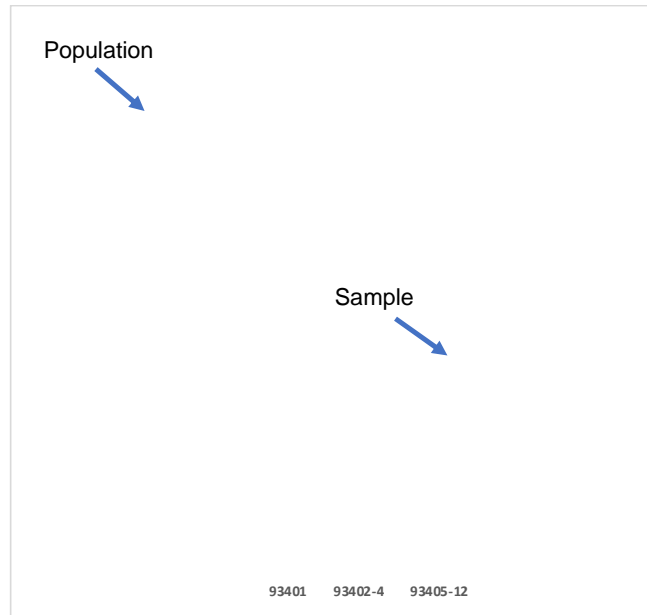
### 3 Local Stakeholder Survey



During the course of significant policy dialogs, some stakeholder groups are more likely to represent their interests than others. Generally, agencies for whom a policy has more immediate responsibility will be leading contributors to the dialog, especially in a place like California with high standards for official transparency. On the private side, more vocal stakeholders are likely to be regulated entities, enterprises with direct economic interests, and individuals and non-governmental organizations with salient interests in the policy at hand. The dialog on DCPD closure has been quite typical in this sense, and most of the stakeholder engagement on this has been dominated by these voices.

For the present assessment, we have sought to more inclusively assess local community perceptions of the economic implications of DCPD closure. This was done by conducting an online survey using a randomized sample of SLO stakeholders obtained from Dunn and Bradstreet. Our sample consisted of 239 respondents, representing a diverse community of enterprises, NGOs, and local public agencies (including education). Because of time and budget constraints, we did not study individual households, leading to under-sampling in more residential areas (Figure 1). We do believe, however, that a household survey would be a useful extension of our approach.

**Figure 1: Stakeholder Population and Survey Sample:  
Percent Shares by ZIP Code**



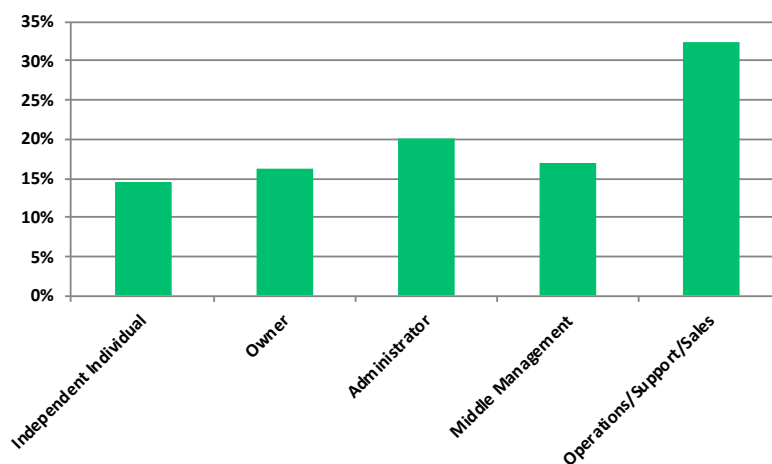
### 3.1 Methods and Data

As indicated above, this was an online survey reaching a randomized local sample constructed for this purpose by Dunn and Bradstreet. The sample ultimately comprised 239 respondents representing three SLO local stakeholder groups, summarized in Table 1. Although we asked a variety of questions that would identify functional characteristics of the respondents' institution, we guaranteed non-disclosure of names, locations (beyond ZIP code), and affiliations. Respondents came from diverse positions in their organizations and responded independently (Figure 1).

**Table 37: Survey Sample by Type of Stakeholder**

Answer	Percent
Private Enterprise	31
Non-Governmental Organization	13
Public Agency / Education	56
	100

**Figure 2: Respondent Self-identification**



The survey itself consisted of 42 questions, some divided by stakeholder groups, and was distributed by email with online access provided by SurveyMonkey.com. The responses were only tabulated, and not subjected to other statistical methods. Questions were developed in three categories:

- Basic Information . functional attributes of respondents and their institutions
- General Economic Outlook . expectations and sentiment regarding individually relevant trends in the SLO economy.
- Perspectives on DCPD Closure . sentiment and opinion regarding prospective closure, attendant policies, and policy dialog

In the following sub-section, we discuss general and specific findings of the survey. We relied on research literature on survey design (see e.g. Choi and Varian: 2012, Taylor and McNabb: 2007, Pesaran and Weale: 2006) for our questions regarding expectations and sentiment. Generally speaking, respondents were asked to self-identify their organizational type (Enterprise, NGO, Public Admin) and they consider structured questions of immediate relevance to the economics of DCPD closure. The use of structured questions to rank expectations and sentiment is generally best for standardizing responses and reducing uncertainties associated with individual written expression. Across such a diverse community, and without the resources for intensive individual interviews, this was determined to be the most practical survey approach.

The basic approach works as follows: present the respondent with a structured statement or quote and ask them to rank their level of agreement/sentiment according

to a small number of alternative responses; the results are then tabulated to indicate the scope and salience of the different answers. In each case below, we explain the alternatives presented to the respondent and summarize the relevant survey results.

### 3.1.1 General Economic Outlook

Expectations and sentiment regarding economic trends are based on individual/institutional experience, attention to relevant local and other evidence, and a respondent's personal opinions. While it can be difficult to disentangle these at times, the present survey offers relatively clear indications of general optimism regarding recent experience and expectations about SLO's local economy. There is also significant agreement about systemic sources of risk and uncertainty. While these need to be taken seriously, they reflect broader concerns in California's more prosperous coastal communities.

For example, the Enterprise group was asked about how their individual business conditions today compared to one year ago and five years ago. As Table 38 and Table 39 indicate, expanding local firms were more than twice as common as firms experiencing contraction.

**Table 38: Percent of Firms Reporting Business Expansion Compared to 1 and 5 Years Ago**

Category	1-Year Horizon	5-Year Horizon
Employment	39%	55%
New Orders	47%	66%
Dollar Sales / Earnings	50%	61%

**Table 39: Percent of Firms Reporting Business Decline Compared to 1 and 5 Years Ago**

Category	1-Year Horizon	5-Year Horizon
Employment	18%	27%
New Orders	19%	19%
Dollar Sales / Earnings	16%	29%

In addition to direct experience, we asked stakeholders to respond to structured statements about local economic sentiment. More detailed responses are presented later, but the general reactions are summarized for each of the three stakeholder groups in Table 40. With these sentiment rankings, individual respondents assigned a score that corresponded to their degree of agreement with each structured statement. Acceptable responses were: Agree (4), Somewhat agree (3), Neither agree nor disagree (2), Somewhat disagree (1), or Disagree (0). Thus entries in Table 40 indicate the percentage of all respondents, for each statement and stakeholder type, who rank the statement as 4 or 3.

Several statements are affirmed by a significant majority within and even across stakeholder groups, and this insight applies to both optimistic and pessimistic statements. Local affordability challenges, particularly in the real estate market, command the highest and most consistent agreement. A consistent, but lesser majority of stakeholders agree about the robustness and vibrance of SLO’s local economy. This confirms the positive enterprise experience cited above, but even more emphatically for NGOs and public sector interests.

**Table 40: Percent of the Sample in Agreement with Each Statement, by Stakeholder Group**

Statement	Percent in Agreement		
	Business	NGO	PubAdm
"San Luis Obispo County has a robust, vibrant economy."	50%	53%	58%
"Housing prices are having a negative impact on the local economy."	75%	87%	80%
"Marketing to and attraction of job candidates is a persistent challenge in the county."	81%	80%	72%
"Economic anchors like DCPD or CalPoly benefit the economy, but also allow county residents to be complacent about long-term challenges to promote economic growth and diversification."	71%	80%	63%
"San Luis Obispo County suffers from a persistent 'affordability gap' between wages and housing costs."	94%	93%	90%

The percentages in Table 40 indicate qualitative responses to the statements, categorical agreement or disagreement. A slightly difference approach to sentiment measures the degree of these sentiments, using weighted average scores to more accurately reflect the intensity of confidence or other sentiments articulated in the

statements. This approach is more common in modern business and political cycle analysis, where degrees of conviction are important to identify priorities, momentum, and potential turning points. As can be seen by comparing Table 40 and Table 41, both agreement and conviction are quite strong for the cost of living risk statements, but opinion is more divided on the more complex statements about economic robustness and complacency.

**Table 41: Average Ranking of Agreement on Each Statement, by Stakeholder Group**

Statement	Weighted Average		
	Business	NGO	PubAdm
"San Luis Obispo County has a robust, vibrant economy."	2.3	2.2	2.5
"Housing prices are having a negative impact on the local economy."	3.2	3.4	3.3
"Marketing to and attraction of job candidates is a persistent challenge in the county."	3.2	3.4	3.0
"Economic anchors like DCPD or CalPoly benefit the economy, but also allow county residents to be complacent about long-term challenges to promote economic growth and diversification."	2.8	2.9	2.7
"San Luis Obispo County suffers from a persistent 'affordability gap' between wages and housing costs."	3.7	3.7	3.7

Note: Ranking are average scores for each statement and stakeholder type.

**Table 42: Sentiment Ranking for the Economic Impacts of DCPD Closure on Private Enterprises**

	Very Important Score=3	Somewhat Important Score=2	Not Important Score=1	Weighted Average Score=0
Business Environment	53%	27%	20%	2.3
Labor Availability	43%	43%	13%	2.3
Material Costs	20%	50%	30%	1.9
Labor Costs	23%	60%	17%	2.1
Utility Costs	50%	33%	17%	2.3
Rental Rates	47%	33%	20%	2.3
Property Values	57%	30%	13%	2.4
Public Goods and Services	21%	55%	24%	2.0



On the issue of DCPD closure, the enterprises in our sample showed a strong majority opinion that closure would be **important** to business operating conditions. Since the results of our assessment basically contradict most of these sentiments, better information on the complex and offsetting impacts of closure can offer important support to SLO enterprise expectations.

Table 43 compares expectations across all three stakeholder types. A number of salient insights emerge from these results. Firstly, the enterprise community is much less pessimistic than NGOs and public institutions. In part, their generally positive experience over the last five years likely contributes to a feeling of resilience. Although few businesses responded **better**, it is important to recall that this question asked about the specific impact of DCPD on their operations. Most clearly feel they will not be affected or might even be better off. NGOs are more polarized, with the largest percentages of both pessimists and optimists. It would be useful to identify the factors contributing to these polarized sentiments because they could complicate orderly policy dialog and even necessary institutional adjustments. Of course, this can't be done with the present sample because the identities of respondents are confidential. Results for public institutions (most pessimistic, least optimistic) are not unexpected, as they have the strongest bond to the status quo and are primary beneficiaries of revenues specifically committed from DCPD. Once again, we hope this group can benefit from the findings of the present study, indicating that adverse economic impacts attributable to closure will be much smaller than is anticipated by some, and that private markets seem to significantly discount pessimism about the SLO property market and public sector financial integrity.

**Table 43: Following DCPD closure, do you expect your Institution to fare better, worse, or stay the same?**

Respondent	Percent		
	Better	Same	Worse
Private Businesses	7%	77%	17%
Non-governmental Organizations	17%	50%	33%
Public administration / government	3%	50%	47%

Although there are clear disparities between public and private sector expectations regarding closure impacts, there is remarkable agreement about what issues are most important for the local economy. As Table 44 and Table 45 clearly indicate, Enterprises, NGOs, and Public Agencies generally agree on the higher priority risks and rewards that are subject to economic uncertainty. Taking these results, discordant expectations over shared values, makes a very compelling case for determined and expanded

commitments to ongoing policy dialog. We already know that SLO governments are pursuing this with dedicated (SB1090) and other funds, including the new Hourglass Project. We can only hope the evidence presented here will support more robust and constructive engagement to mobilize local institutions.

**Table 44: What are Your Primary Concerns About DCPD Closure**

Statement	Percent “Very Important”		
	Business	NGO	PubAdmin
Economic uncertainty	73%	50%	66%
Loss of tax revenue	70%	73%	81%
Loss of jobs	72%	78%	72%
Emigration	21%	20%	23%
Electricity costs	47%	45%	44%
Change in real estate values	43%	44%	43%

**Table 45: Score Your Primary Concerns About DCPD Closure**

Statement	Weighted Average (0 to 3)		
	Business	NGO	PubAdmin
Economic uncertainty	2.7	2.4	2.6
Loss of tax revenue	2.6	2.6	2.8
Loss of jobs	2.6	2.8	2.7
Emigration	1.8	2.0	1.9
Electricity costs	2.2	2.5	2.2
Change in real estate values	2.4	2.3	2.3

Assuming this recommendation is taken to heart, an unintended but essential benefit of DCPD closure could be a new generation of multi-stakeholder commitment to sustainable and inclusive growth across the SLO economy. Shared values will provide welcome cohesion, while discordant expectations can stimulate constructive discourse, develop more evidence, and motivate the community to improve mutual awareness. To facilitate this, our survey also sought to identify leading concerns and opinions about DCPD. These hallmark issues could be used to jump start and sustain a forward-looking dialog for community strategic planning.

**Table 46: Do You Agree or Disagree with the Following Statements?**

Statement	Percent Agreeing		
	Business	NGO	PubAdm
"The loss of workers from the power plant will have a severe negative impact on the local economy."	73%	75%	78%
"The County is embedded in a diversified and robust regional economy. Decommissioning will create opportunities for modernization and skill-intensive growth."	30%	25%	40%
"Government services such as schools or public transit will be severely impacted by the loss of tax revenue."	90%	67%	86%
"PG&E employees are active community members, losing them would have a substantial negative impact on the community."	80%	83%	75%
"Heavy vehicle traffic from decommissioning will have a significant detrimental impact on local roads and economic activity."	37%	42%	38%

**Table 47: Rank the Importance to you of Following Statements**

Statement	Weighted Average (0 to 4)		
	Business	NGO	PubAdm
"The loss of workers from the power plant will have a severe negative impact on the local economy."	2.9	3.08	3
"The County is embedded in a diversified and robust regional economy. Decommissioning will create opportunities for modernization and skill-intensive growth."	1.5	1.75	2.02
"Government services such as schools or public transit will be severely impacted by the loss of tax revenue."	3.3	3.08	3.42
"PG&E employees are active community members, losing them would have a substantial negative impact on the community."	3.17	3.17	2.98
"Heavy vehicle traffic from decommissioning will have a significant detrimental impact on local roads and economic activity."	1.9	2.33	2.23

The tables above present the survey findings on salient issues, by stakeholder type, measuring degree of relevance

Table 46) and conviction (Table 47). Here we consider only five among a very long agenda of issues, but these were consistently deemed central to current discussions of closure impacts. Addressing them first will help establish standards for more ambitious community strategic dialog.

### 3.1.2 SB 1090 Awareness

On September 19, 2018, then-Governor Jerry Brown signed Senate Bill No. 1090, directing the California Public Utilities Commission to approve a settlement which includes \$85 million to mitigate the impacts of the closure (\$75 million distributed among local governments and \$10 million to be spent on economic development). The majority of survey respondents were aware of this bill (Table 48), and we asked all to consider a set of seven alternative (but not mutually exclusive) uses of these funds in SLO County.

**Table 48: Prior to taking this Survey, were You Aware of SB 1090?**

Response	Percent		
	Business	NGO	Pub Admin
Aware	75	50	79
Not Aware	25	50	21

**Table 49: Do You Agree with the Following Possible Uses of SB 1090 Funds?**

Statement	Percent Agree		
	Business	NGO	Pub Admin
Job training programs for local workers	62%	83%	71%
Marketing and recruitment of new workers and their families	37%	75%	48%
Marketing and recruitment of new businesses	72%	75%	68%
Retention programs for graduates of CalPoly SLO and Cuesta College	43%	50%	62%
Investment incentives for technology clusters	70%	67%	68%
Infrastructure investment (roads, public transit, etc.)	76%	83%	89%
Budgetary adjustment assistance for local governments	34%	58%	68%

**Table 50: How would You Score the Following Possible Uses of SB 1090 Funds?**

Statement	Weighted Average (0 to 4)		
	Business	NGO	Pub Admin
Job training programs for local workers	2.7	3.3	2.9
Marketing and recruitment of new workers and their families	1.9	3.0	2.3
Marketing and recruitment of new businesses	2.9	3.1	2.9
Retention programs for graduates of CalPoly SLO and Cuesta College	2.4	2.2	2.7
Investment incentives for technology clusters	2.9	2.7	2.9
Infrastructure investment (roads, public transit, etc.)	3.0	3.3	3.3
Budgetary adjustment assistance for local governments	1.7	2.7	3.0

### 3.1.3 Engagement Panel Awareness and Recommendations

After announcing the closure, PG&E convened the Diablo Canyon Decommissioning Engagement Panel "to foster open and transparent dialogue between members of the local community and PG&E". Since its creation, the panel has held public meetings and workshops, conducted tours of Diablo Canyon lands, and published recommendations as to the decommissioning process. Regardless of their prior awareness of the Panel, we wanted to poll the survey respondents on its recommendations

**Table 51: Respondent Awareness**

	Sample Share
I participated in the panel's activities	3%
I was aware of the panel but did not participate	57%
I was not aware of the panel	40%



**Table 52: Do you Agree or Disagree with the Following Recommendations of the DCPD Engagement Panel?**

Statement	Percent Agreeing		
	Business	NGO	Pub Admin
The decommissioning (decontamination) process should begin immediately upon shutdown with a goal of 10 years for completion of radiological decommissioning and decontamination, avoiding SAFSTOR (which allows up to 60-year delay in decontamination)	66%	82%	68%
The health and safety of the community and the environmental quality of the area should be the primary consideration when evaluating cost-effective methods of decommissioning in order to save ratepayers money	72%	82%	92%
The 12,000 acres that surround the DCPD are a spectacular natural resource and need to be conserved in perpetuity while allowing for managed public access and use	62%	82%	87%
The repurposing of facilities should be explored as a way to both reduce the amount of demolition materials created and create opportunities for new local jobs and economic development while considering public safety, traffic concerns and the environmental quality of the region	79%	82%	84%
The engagement panel should be in a form that would lead to the best possible recommendations on achieving a safe and effective decommissioning of the DCPD, including the disposition of Diablo Canyon Lands and Facilities	66%	82%	92%



**Table 53: Please Score the Following Recommendations in Your Own Order of Importance**

Statement	Weighted Average (0 to 4)		
	Business	NGO	Pub Admin
The decommissioning (decontamination) process should begin immediately upon shutdown with a goal of 10 years for completion of radiological decommissioning and decontamination, avoiding SAFSTOR (which allows up to 60-year delay in decontamination)	2.9	3.3	3.1
The health and safety of the community and the environmental quality of the area should be the primary consideration when evaluating cost-effective methods of decommissioning in order to save ratepayers money	3.1	3.2	3.7
The 12,000 acres that surround the DCPD are a spectacular natural resource and need to be conserved in perpetuity while allowing for managed public access and use	2.5	3.3	3.4
The repurposing of facilities should be explored as a way to both reduce the amount of demolition materials created and create opportunities for new local jobs and economic development while considering public safety, traffic concerns and the environmental quality of the region	3.2	3.2	3.3
The engagement panel should be in a form that would lead to the best possible recommendations on achieving a safe and effective decommissioning of the DCPD, including the disposition of Diablo Canyon Lands and Facilities	3.0	3.2	3.6

### 3.1.4 Detailed Sentiment Results

**Figure 3: Enterprise Sentiment Regarding Statements about the SLO Economy**





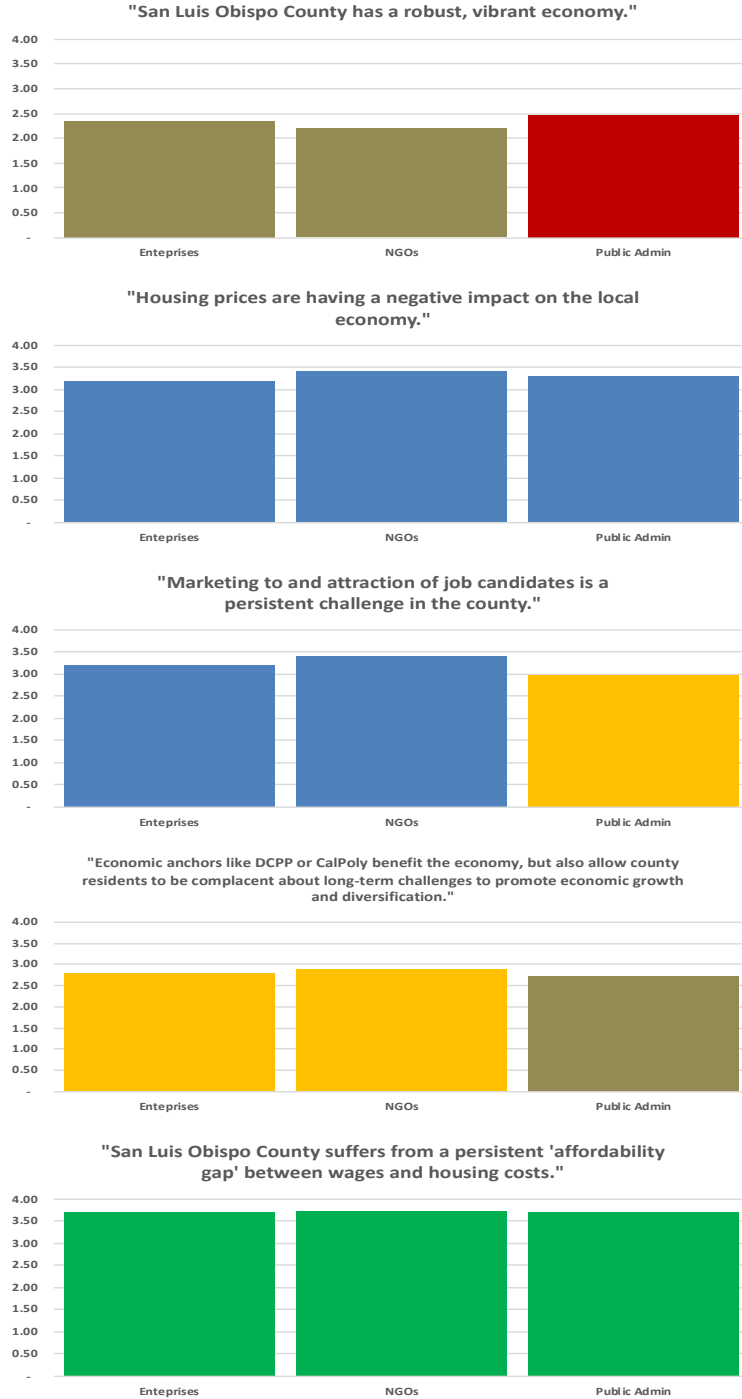
**Figure 4: NGO Sentiment Regarding Statements about the SLO Economy**



**Figure 5: Public Agency Sentiment on Statements about the SLO Economy**



**Figure 6: Stakeholder Scoring/Conviction on SLO Economy Issues**



## 4 Real Estate Market Assessment

### 4.1 Approach

The impact of the DCPD closure on real estate values has been a frequently expressed concern across the spectrum SLO public and private stakeholders. To elucidate the significance of this risk, we made use of a newly-available database of historical housing data from Zillow. Using this highly disaggregated and timely data, we constructed a profile of the housing market in San Luis Obispo County over recent decades, using it to econometrically analyze the impact of the DCPD closure announcement on local housing prices. For comparison, we also looked at the closure of SONGS.

One of the chief concerns of San Luis Obispo County residents is the impact of the Diablo Canyon Power Plant (DCPD) closure on the local housing market. The power plant represents some 1500 well-paying jobs, and its closure could result in the departure of many of these employees and cause some downward pressure on home prices in the county by increasing the supply of homes on the market, removing higher-income potential future buyers, and reducing overall economic activity. It is almost certain that this downward pressure will happen, but the question is whether or not such a closure would have a great enough magnitude to cause significant or lasting changes to the housing market.

To answer this question, we want to look for any event effect associated with the Diablo Canyon closure and other similar instances. In the Diablo Canyon case, this would be looking for signs of speculative price changes in the local housing market in response to the June 2017 closure announcement. In the comparison cases, most notably with the closure of the SONGS in 2013, we would look for proven price changes after the closure. To find (or not find) these event effects, we will use two types of analysis: (1) an event study comparing predicted mean housing prices to observed mean housing prices and (2) a difference-in-differences analysis looking for a specific event effect at the announcement or closure.

Before that, however, we note that the San Luis Obispo County housing market is generally agreed to be robust, with steady growth that has recovered from the 2008 collapse of the subprime mortgage housing bubble, surpassing its pre-2008 high of home prices around 2015-2016, with the exact date varying. This can all be seen in Figures 1 and 2. Homes closer to the power plant experience higher average sales prices, likely because of the power plant's own oceanside location.

## 4.2 Methods and Data

In addition to DCPD and SONGS, we analyzed three national comparison cases: Kewaunee Power Station (KPS) in Wisconsin, Fort Calhoun Nuclear Generating Station (FCNGS) in Nebraska, and Vermont Yankee Nuclear Power Plant (VYNPP) in Vermont. These nuclear plants were chosen for comparison since they closed in the last decade for economic reasons and with significant lead-up time between announcement and closure (unlike, SONGS which closed due to an accident and had only five days between announcement and closure).

In each of these comparison cases, the geographic areas analyzed included the immediate county in which the power plant was located, any adjacent counties, and the constituent counties of any adjacent metropolitan statistical area. For example, with FCNGS we used the counties of Washington, NE (the immediate county); Burt, NE; Douglas, NE; Dodge, NE; Harrison, IA; Pottawattamie, IA (the adjacent counties); Cass, NE; Sarpy, NE; Saunders, NE; and Mills, IA (the metropolitan counties). A full listing of these geographies is included in Table 54.

The housing data is taken from the Zillow Transaction and Assessment Database, or ZTRAX, an extensive database of housing transactions from the 1970s to 2017. This analysis only uses sales transactions, excluding mortgage transfers, inheritances, etc. The dependent variables analyzed are Sales Prices, Price per Square Foot, Price per Bedroom, and Sales Prices of Two Bedrooms. The database provides geographic data such as address and coordinates used to geographically locate each transaction.

For each transaction in our analyzed geographic areas, we also produced distances between the transacted property and the power plant of interest, using the associated latitude/longitude data and great-circle distance measurement.

For the difference-in-differences, the control variables are taken from the same database: square footage, number of bedrooms, age of the house, and categorical variables for zip code and year of the transaction.

For the event study, the predicted values are produced using the non-seasonally adjusted figures for the Federal Housing Finance Agency's Purchase Only House Price Index. For each instance, we produced predictions for the House Price Index for the United States and for the corresponding census divisions. The corresponding census divisions for each power plant are listed in Table 54.

#### 4.2.1 Event Study

For the purposes of the event study, the predicted values are produced using a simple regression of monthly mean dependent variables on the House Price Index:

$$\text{Mean Housing Price}_{it} = \alpha_0 + \alpha_1 \text{House Price Index}_{it} + \epsilon_{it}$$

These regressions were produced with an estimation window of 60 months (i.e. 5 years) beginning 65 months before the event. We then use these regressions to create predicted values for all our observed monthly means before taking the difference between the observed and predicted values, which is the deviation value.

To interpret the deviation, take, for example, the San Luis Obispo County housing market compared to the national market. A positive deviation at any given time indicates that the San Luis Obispo County housing market is experiencing mean home prices higher than one would expect given the national market and the recent historical relationship between the two. A negative deviation would indicate the opposite. We would expect this deviation to maintain itself around zero, with some constant fluctuation around that point. These deviations are adjusted for means (most CA market averages are much higher than their national counterparts) and bounded by standard errors produced with the predictions.

#### 4.2.2 Difference-in-Differences

The difference-in-differences (DinD) analysis is built around a simple hedonic regression of home sales prices on different property characteristics from the ZTRAX data: square footage, number of bedrooms, age of the property, as well as indicators of the property's zip code and the year of the transaction. The treatment variables used are distance from the power plant being analyzed, a pre-post indicator variable for whether the transaction occurred after the closure or announcement, and an interaction variable between the two.

$$\begin{aligned} \text{Sales Price}_{it} = & \alpha_0 + \alpha_1 \text{Distance}_{it} + \alpha_2 \text{After Closure}_{it} + \alpha_3 \text{Distance}_{it} * \text{After Closure}_{it} \\ & + \gamma \text{Controls}_{it} + \delta_1 \text{Zip Code Indicator}_{it} \\ & + \delta_2 \text{Transaction Year Indicator}_{it} + \delta_3 \end{aligned}$$

Thus, the coefficient of interest for the event effect would be the coefficient on the interaction variable ( $\alpha_3$  in the above equation). To interpret this, a positive coefficient indicates that, after the closure, each additional mile away from the reactor is

associated with an increase in expected home prices equal in magnitude to the sum of the coefficient on the distance variable ( $\beta_2$ ) and the coefficient of interest. The opposite is also true for negative coefficients. Thus, an announcement/closure effect involving an increase in prices would exhibit a negative coefficient of interest.

For the Diablo Canyon announcement in June 2016, the event study finds an observed deviating fall in housing prices since the announcement, across all the dependent variables (See Figure 7 and Figure 8). This fall, though significant, is not large in magnitude. As the housing market is much less liquid and responsive than, for example, the financial market, and as this is only the *announcement* of the Diablo Canyon closure, this fall should be interpreted with care. Additionally, the relative recency of the closure announcement means there is less trailing data to analyze adjustments since the announcement. This announcement effect is driven largely by the transactions located closer to the power plant, specifically the %less than 10 miles+ and %0 to 20 miles+groups. This can be seen in Figure 9 through 13.

By comparison, however, the DiD analysis found a significant negative coefficient on the DiD variable, which indicates a positive announcement effect on the housing market and contradicts the conclusions from the event study. This positive announcement effect is also relatively small in magnitude. This negative result could be a result of an end to discounting of prices due to a taste preference for not living in proximity to a nuclear reactor.

For the SONGS closure in June 2013, the event study finds an observed deviating rise in housing prices since the closure, across all the dependent variables. This rise is relatively large in magnitude. This is consistent with proximity to the power plant. Similar to the DCP analysis, the DiD results for SONGS also have a negative interaction coefficient. This is consistent with the event study analysis.

In the national comparisons, detailed in Figures 16 through 18, the event studies exhibited little to no significant closure impact, and where such an impact could be identified (specifically the Vermont Yankee case in Figure 18) this has a very quick rebound in prices, likely indicating that the most significant downward pressure is an immediate and transient fall in prices as would be expected from an increase in sales due to departing power plant employees. Though they are not included here, breaking up these instances by distance does not result in any change from these observations. In the national DiD analysis, the Fort Calhoun case resulted in insignificant negative coefficients as with DCP and SONGS for both its announcement and closure. The Kewaunee case resulted in an insignificant negative coefficient for the announcement and a significant positive for the closure. The Vermont Yankee case resulted in

insignificant positive coefficients for both the announcement and the closure. All-in-all these are mixed results, with some lean towards no significant negative impact.

### 4.3 Results

All-in-all, analyses of the housing markets after the announcement of the DCPD closure and after the announcements and closures of other nuclear power plants in the last decade indicate that the housing market in San Luis Obispo County is unlikely to be substantially undermined by the DCPD closure. Though a recent announcement effect can be found in event analyses and some temporary closure effects can be found in the comparison cases, these cases indicate such a hit is unlikely to be a long-term problem now or after the actual closure of DCPD.

**Table 54: Temporal and Geographic Information of Nuclear Power Plant Cases**

Power Station	Announcement Date	Closure Date	County	Other Included Counties	MSA	Census Division	Coordinates
Fort Calhoun Nuclear Generating Station	16-Jun-2016	24-Oct-2016	Washington, NE	Burt, NE; Douglas, NE; Dodge, NE; Cass, NE; Sarpy, NE; Saunders, NE; Mills, IA; Harrison, IA; Pottawattamie, IA	Omaha-Council Bluffs, NE-IA	West North Central	41.5203° N, 96.0772° W
Vermont Yankee Nuclear Power Plant	28-Aug-2013	29-Dec-2014	Windham, VT	Windsor, VT; Bennington, VT; Sullivan, NH; Cheshire, NH; Franklin, MA	n/a	New England	42.7789° N, 72.5131° W
Kewaunee Power Station	22-Oct-2012	7-May-2013	Kewaunee, WI	Door, WI; Manitowoc, WI; Brown, WI; Oconto, WI	Green Bay, WI	East North Central	44.3422° N, 87.5361° W
Diablo Canyon Power Plant	21-Jun-2016	26-Aug-2025	San Luis Obispo, CA		San Luis Obispo-Paso Robles, CA	Pacific	35.2108° N, 120.8561° W
San Onofre Nuclear Generating Station	7-Jun-2013	12-Jun-2013	San Diego, CA	Orange, CA	San Diego-Carlsbad, CA	Pacific	33.3689° N, 117.555° W



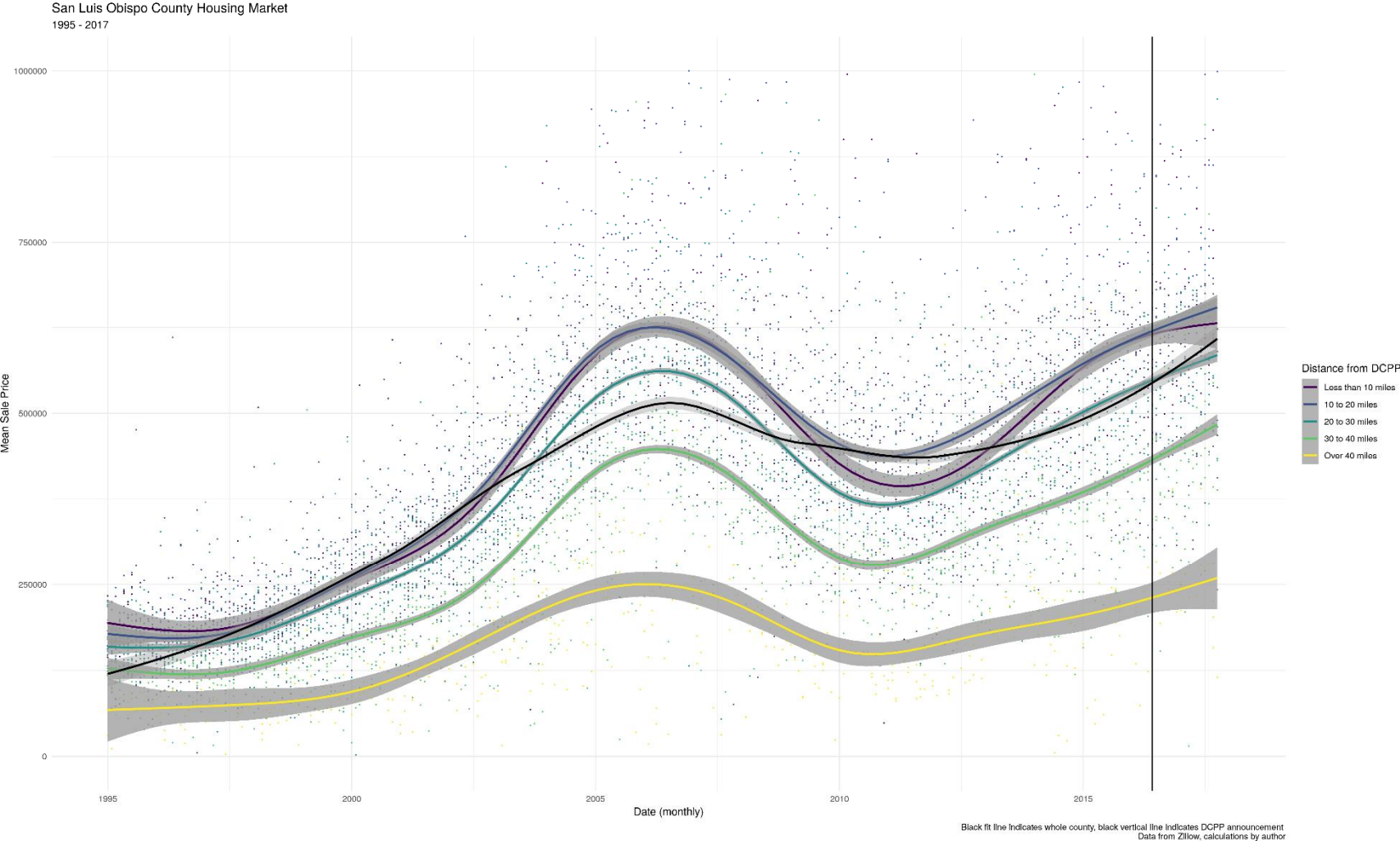
**Table 55: Difference-in-Differences Estimates<sup>3</sup>**

	DCPP Announcement	SONGS Closure	FCNGS Announcement	FCNGS Closure	KPS Announcement	KPS Closure	VYNPP Announcement	VYNPP Closure
Distance from power plant	-6826.64*** (335.37)	-6498.65*** (354.30)	6,011.89 (13,386.16)	5,539.62 (14,742.00)	-8,080.39 (4,413.37)	-10,495.76* (4,632.85)	2,390.63** (801.29)	1,838.19* (860.60)
Post indicator	62717.72*** (9,928.33)	175,262.19*** (4,952.27)	-46,613.60 (125,106.65)	30,811.37 (154,073.70)	39,977.57 (61,964.09)	-191,067* (81,064.53)	3,601.02 (8,532.07)	-7,186.26 (11,175.98)
Distance * Post	-2493.00*** (357.26)	-3,855.37*** (89.86)	-3,018.03 (5,579.60)	-4,364.41 (6,543.10)	-976.44 (1,745.41)	5,486.03* (2,544.38)	41.56 (177.48)	318.96 (242.25)
Square footage	179.45*** (1.13)	292.39*** (0.68)	110.94*** (9.13)	112.37*** (9.85)	48.16*** (6.37)	48.99*** (6.77)	40.31*** (0.96)	40.80*** (1.04)
Bedrooms	-686.51 (1,002.88)	-28,405.00*** (541.58)	-9,175.44 (16,919.54)	-8,655.85 (18,625.06)	4,389.01 (6,979.07)	4,922.70 (7,494.55)	10,789.13*** (1,762.01)	10,190.59*** 1,907.623
Age	156.12*** (36.78)	783.72*** (28.72)	-1,429.40* (691.01)	-1,516.41* (762.54)	-898.88*** (143.00)	-941.22*** (154.58)	-331.49*** (29.52)	-347.83*** (32.13)

\* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001

<sup>3</sup> Data provided by Zillow through the Zillow Transaction and Assessment Dataset (ZTRAX). More information on accessing the data can be found at <http://www.zillow.com/ztrax>. The results and opinions are those of the authors and do not reflect the position of Zillow Group.

**Figure 7: San Luis Obispo County Housing Market, Mean Sales Price, with groups by distance from the Diablo Canyon Power Plant**



**Figure 8: San Luis Obispo County Housing Market, Mean Price per Square Foot, with groups by distance from the Diablo Canyon Power Plant**

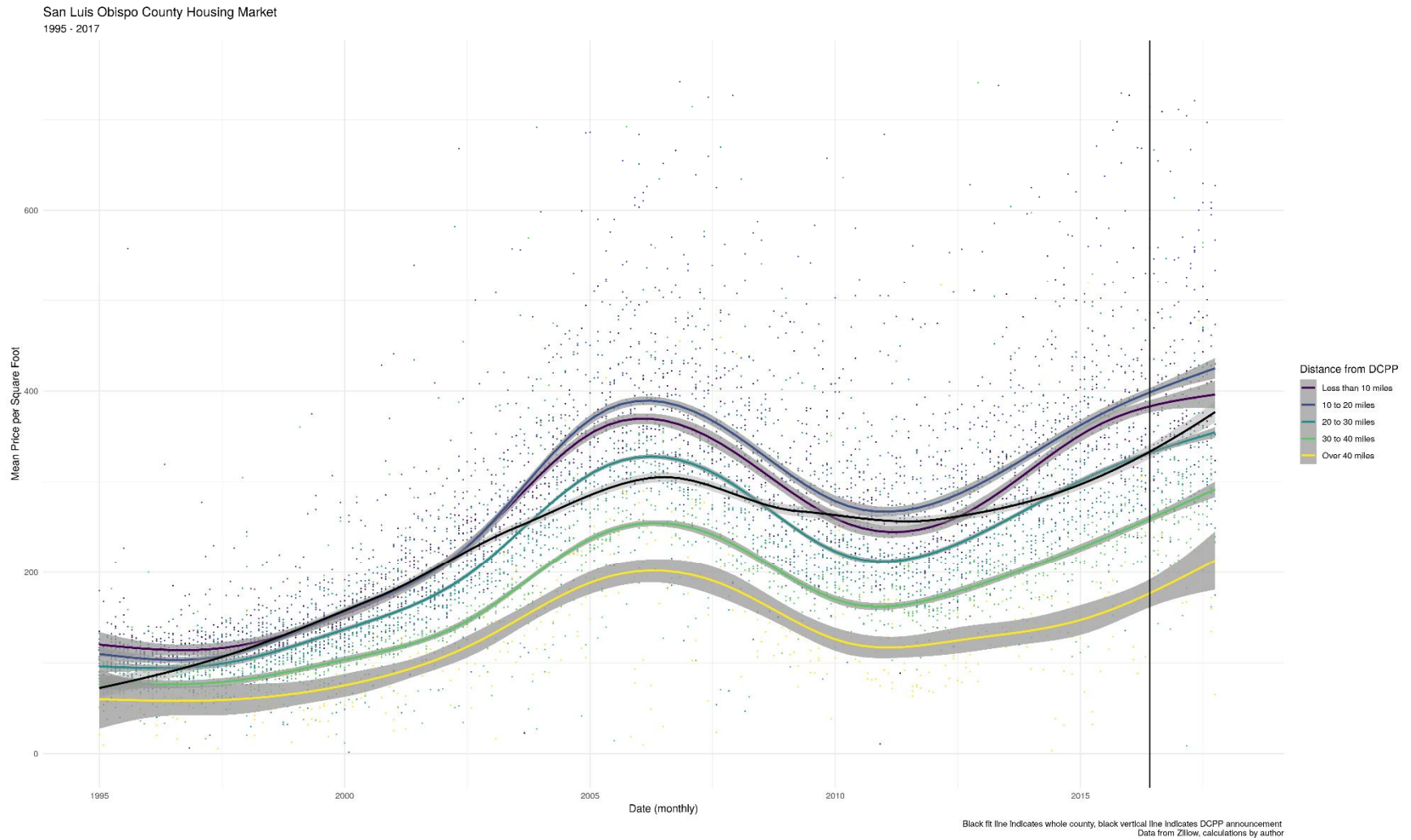


Figure 9: San Luis Obispo County Announcement Effect, Sales Price

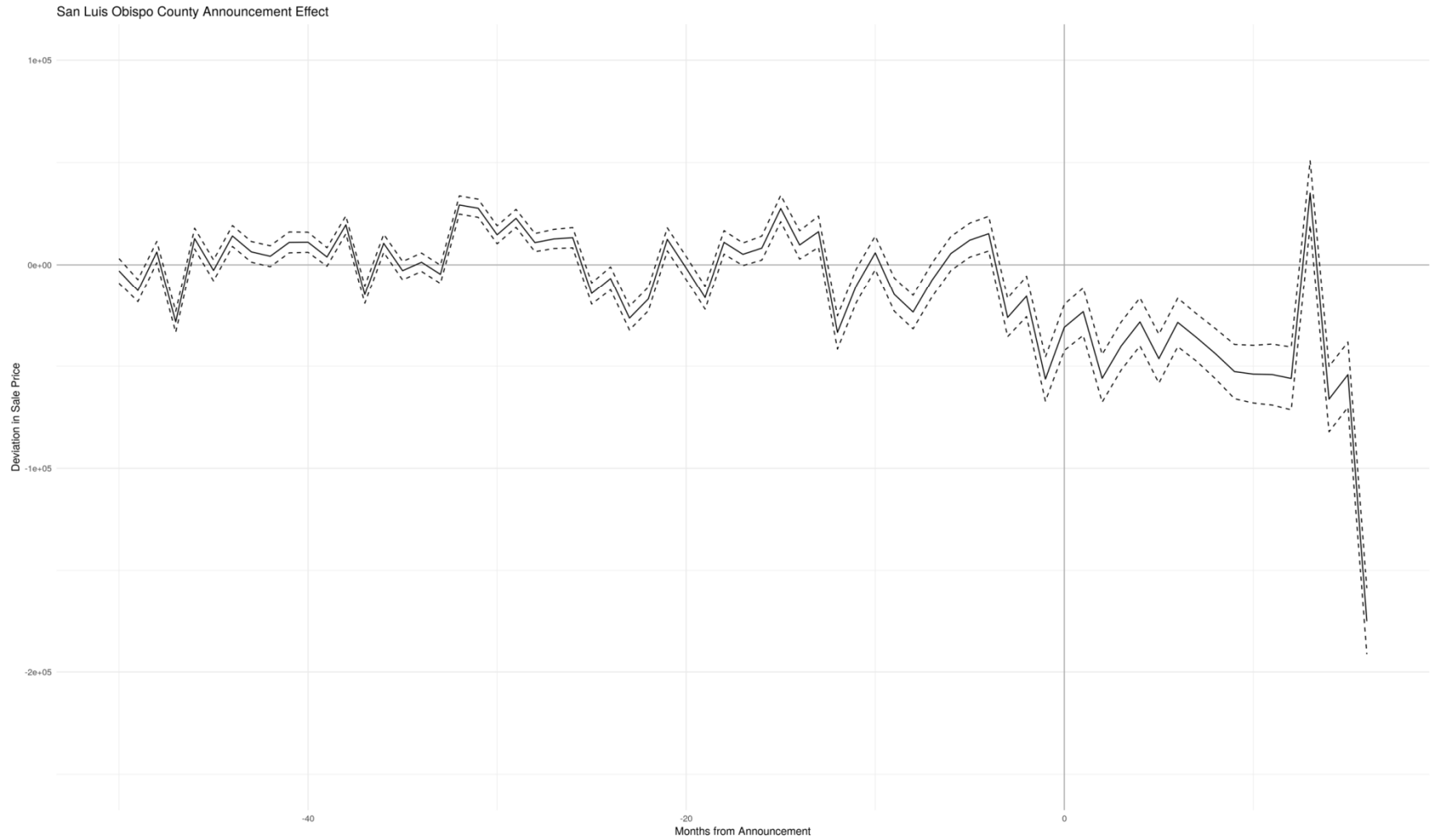


Figure 10: San Luis Obispo County Announcement Effect, Price per Square Foot

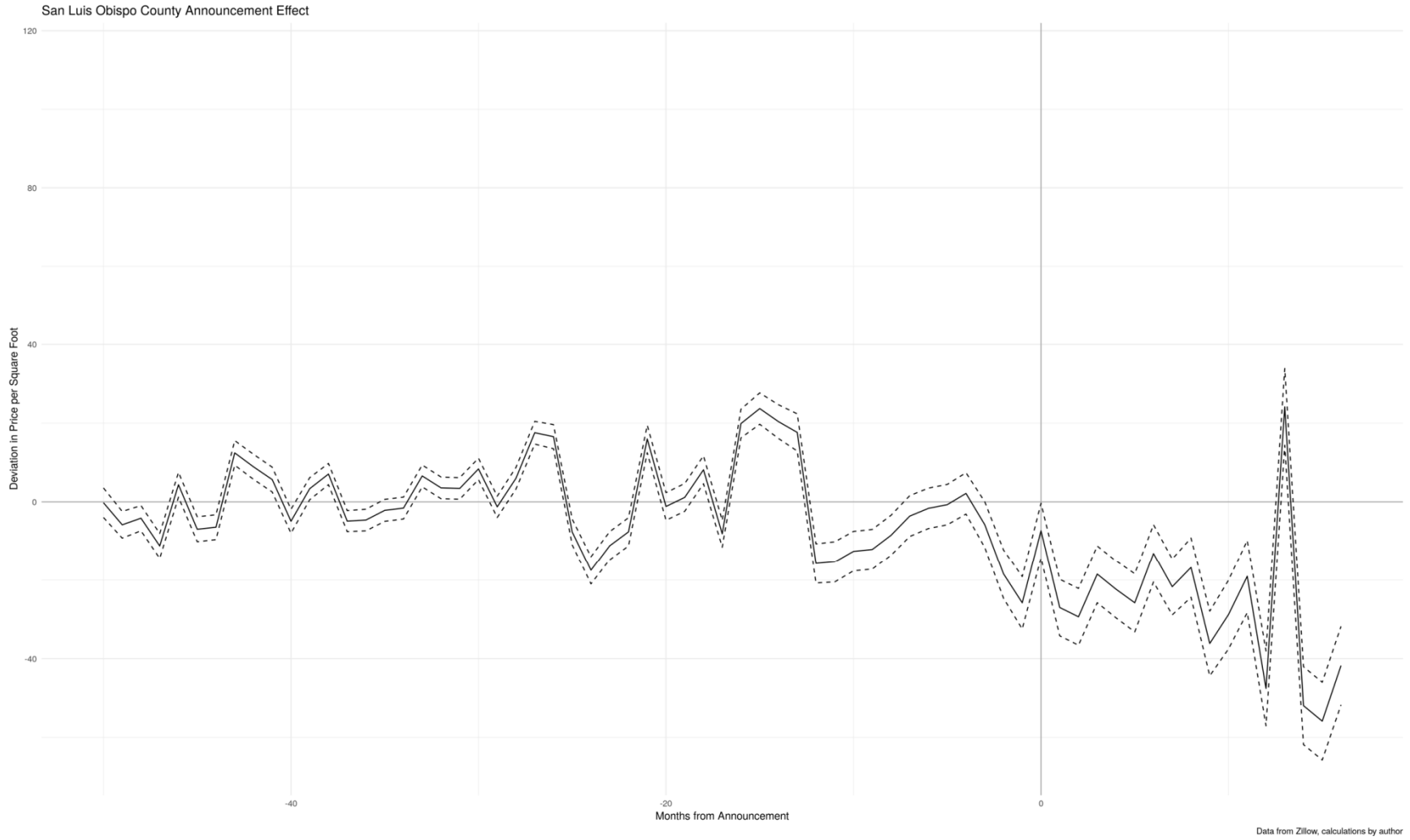


Figure 11: San Luis Obispo County Announcement Effect, Sales Price, Less than 10 Miles from DCP

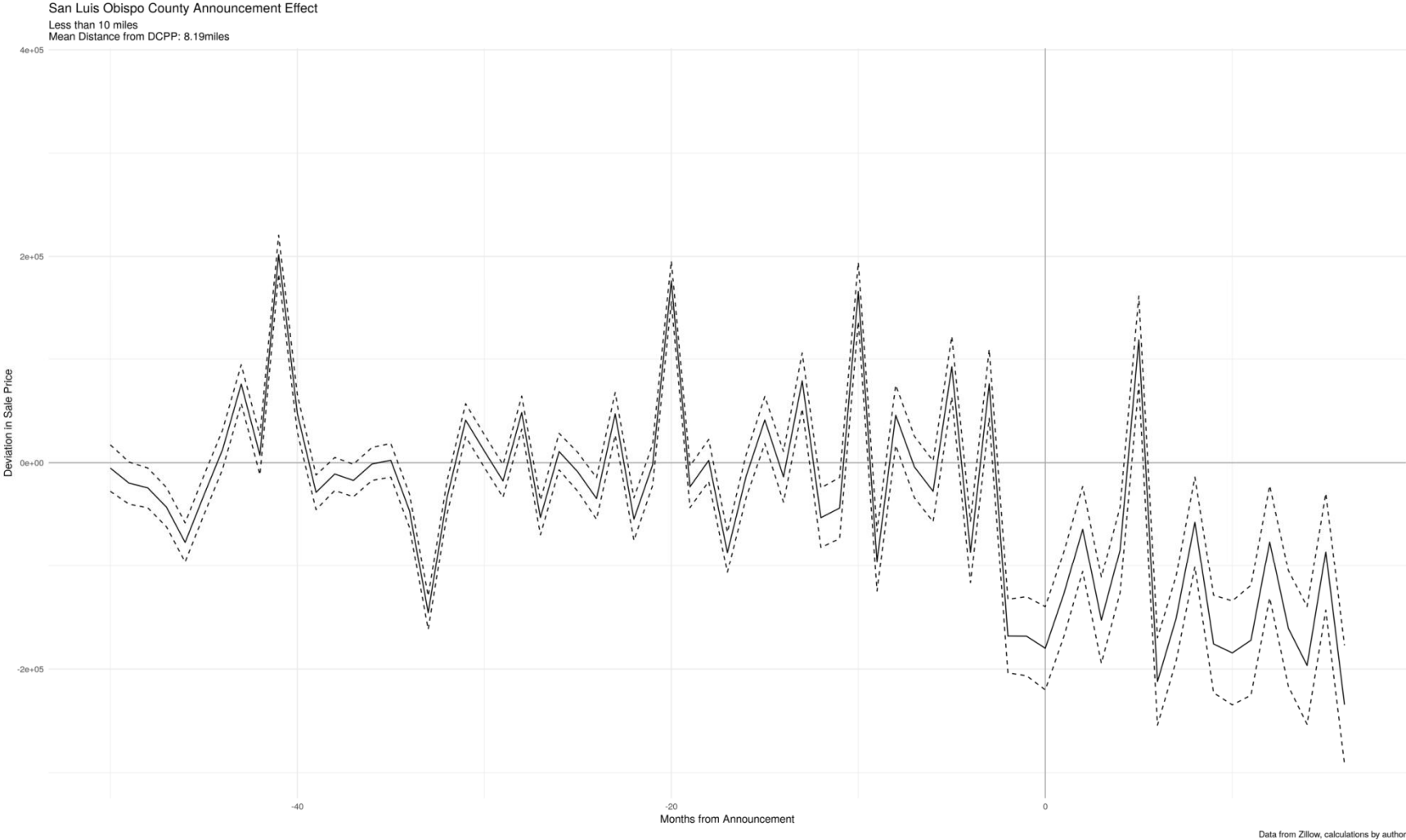


Figure 12: San Luis Obispo County Announcement Effect, Sales Price, 10 to 20 Miles from DCP

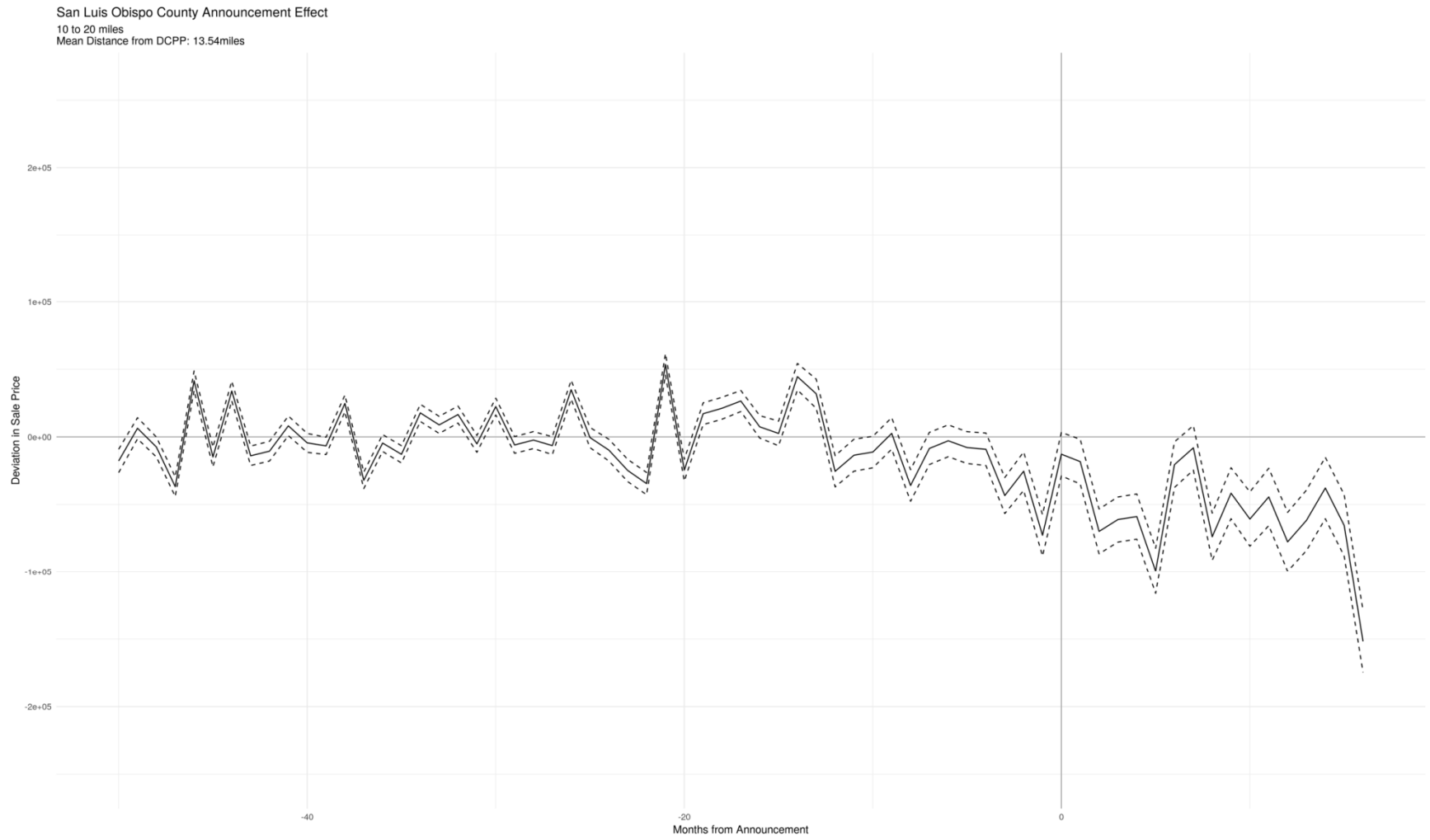
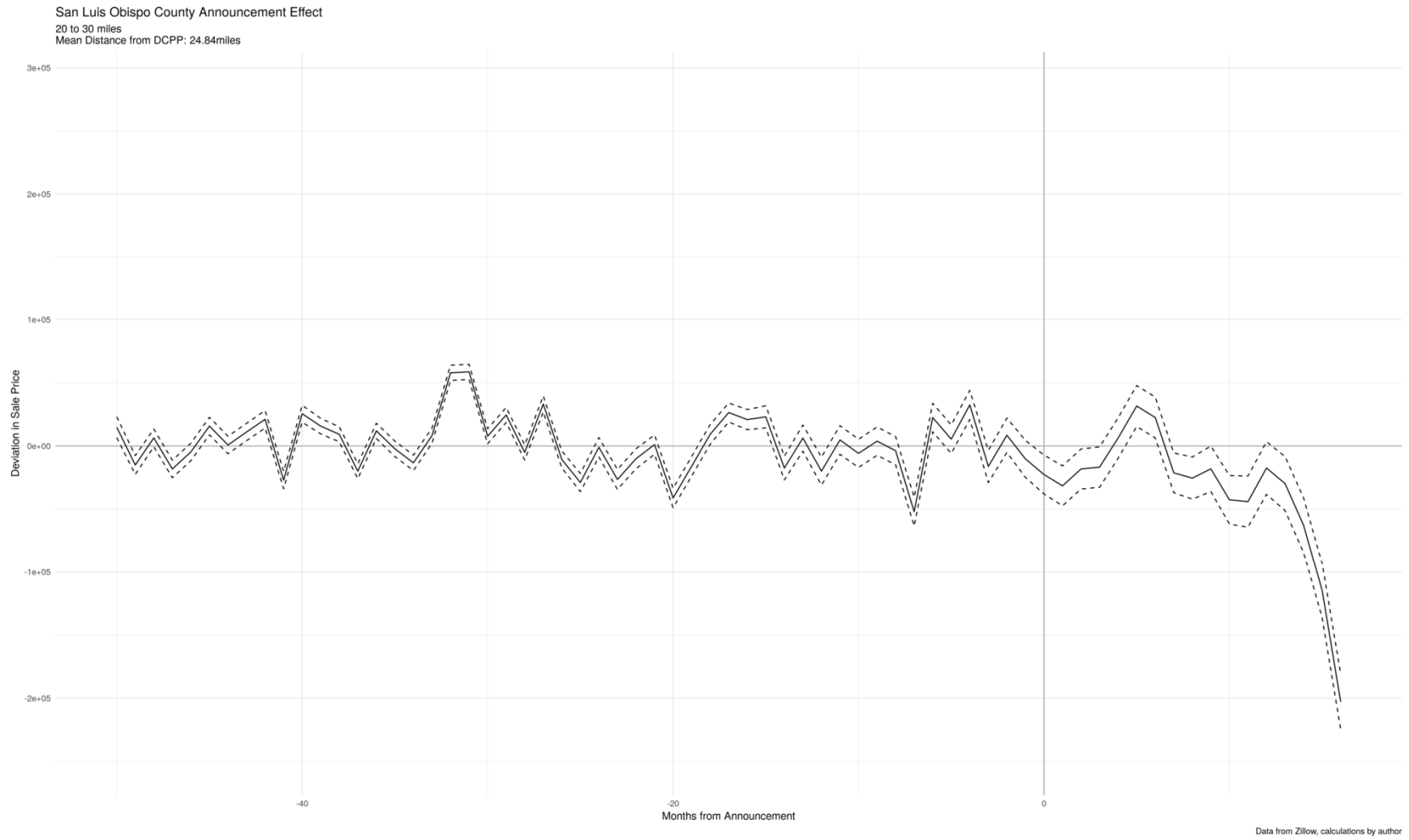
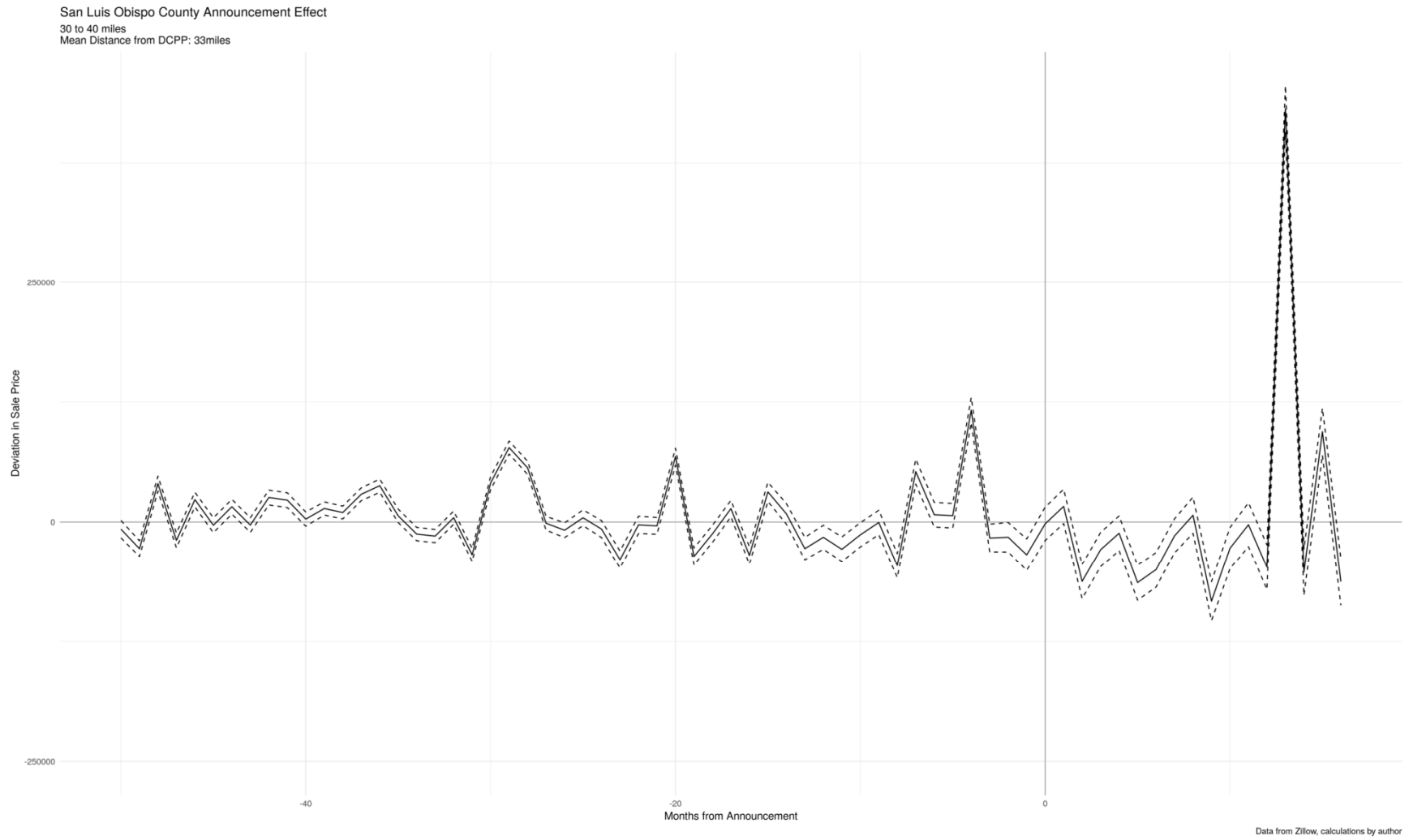


Figure 13: San Luis Obispo County Announcement Effect, Sales Price, 20 to 30 Miles from DCP





**Figure 14: San Luis Obispo County Announcement Effect, Sales Price, 30 to 40 Miles from DCP**



**Figure 15: San Luis Obispo County Announcement Effect, Sales Price, Over 40 Miles from DCP**

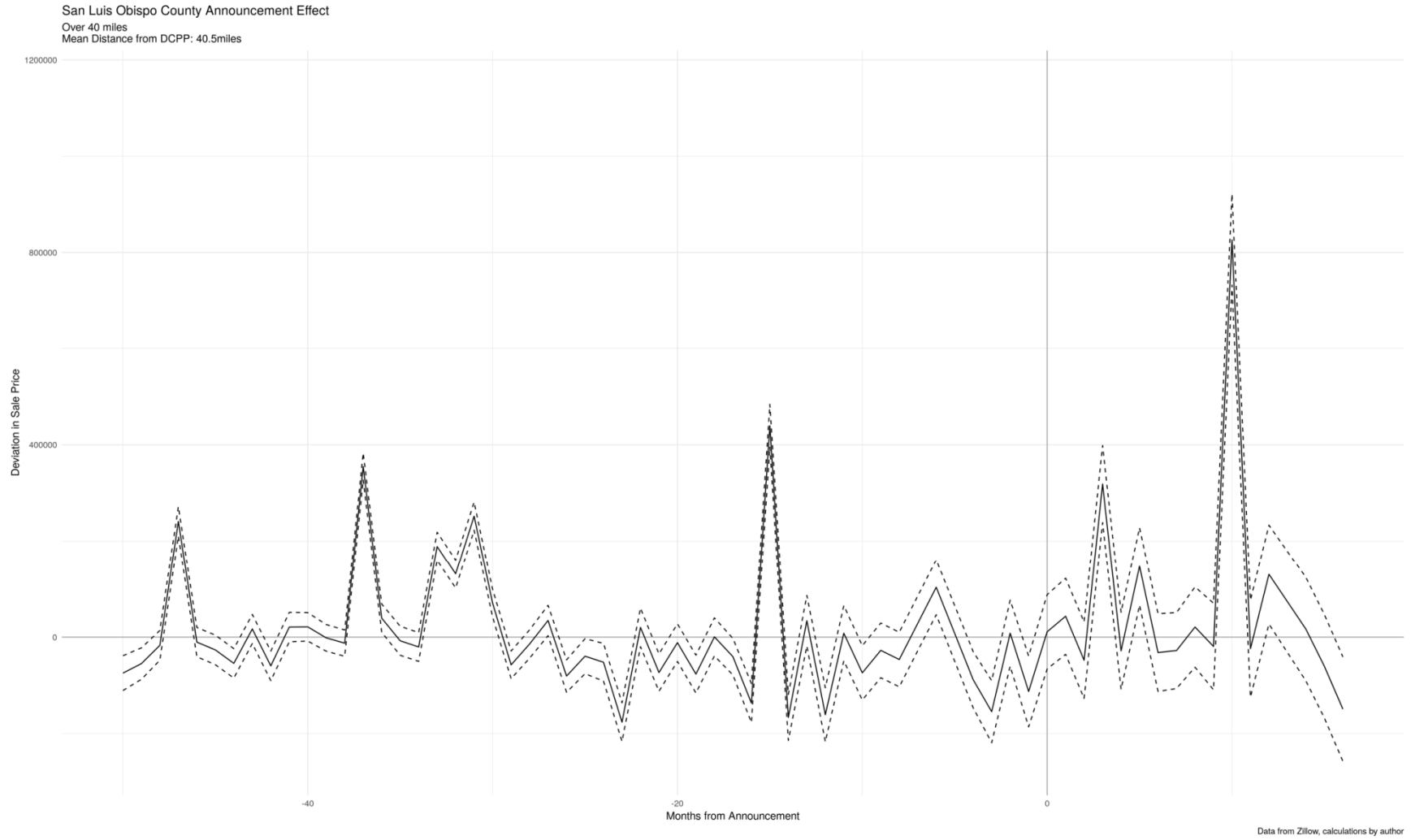


Figure 16: Orange and San Diego Counties Closure Effect, Sales Price

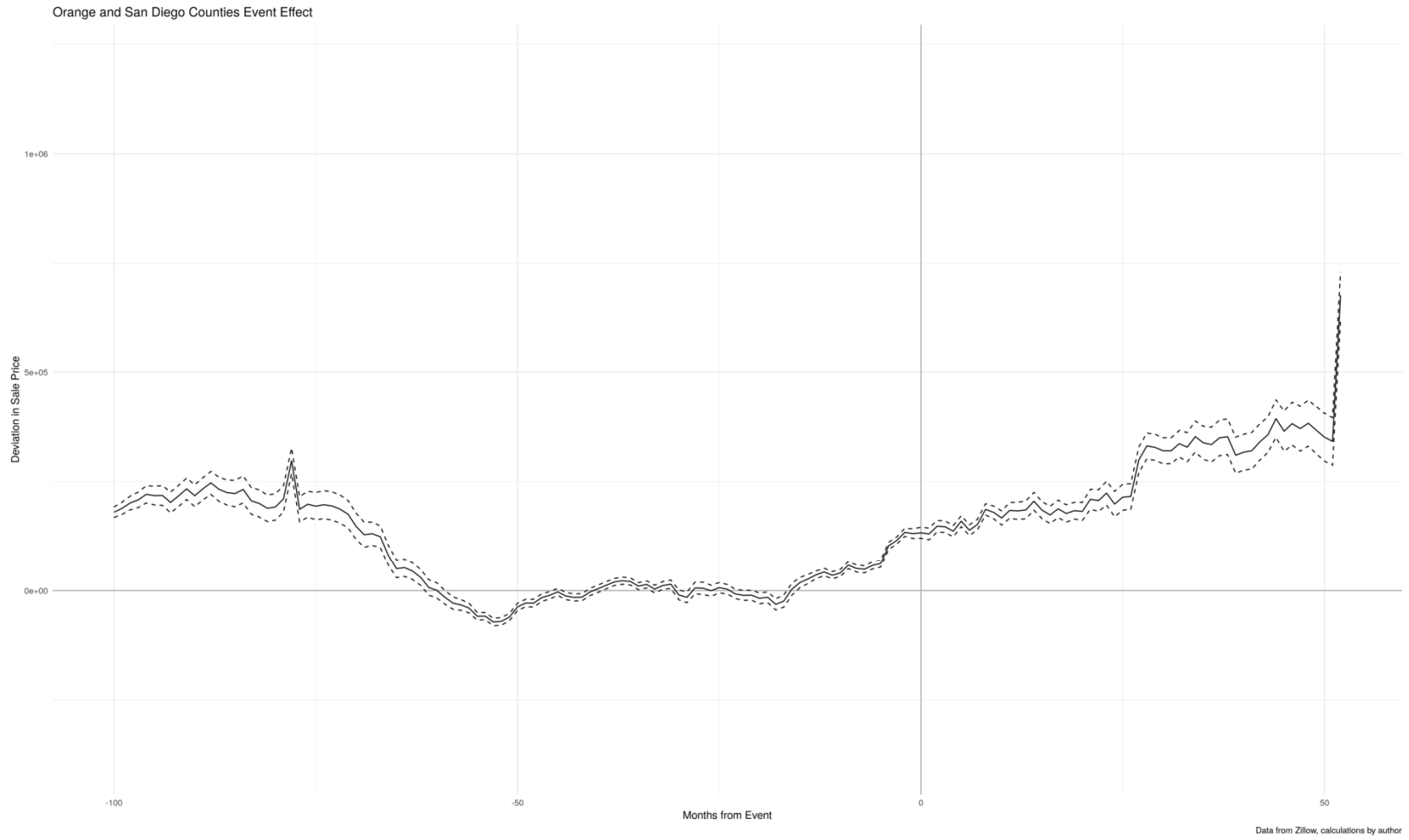


Figure 17: Orange and San Diego Counties Closure Effect, Sales Price, 10 to 20 miles from SONGS

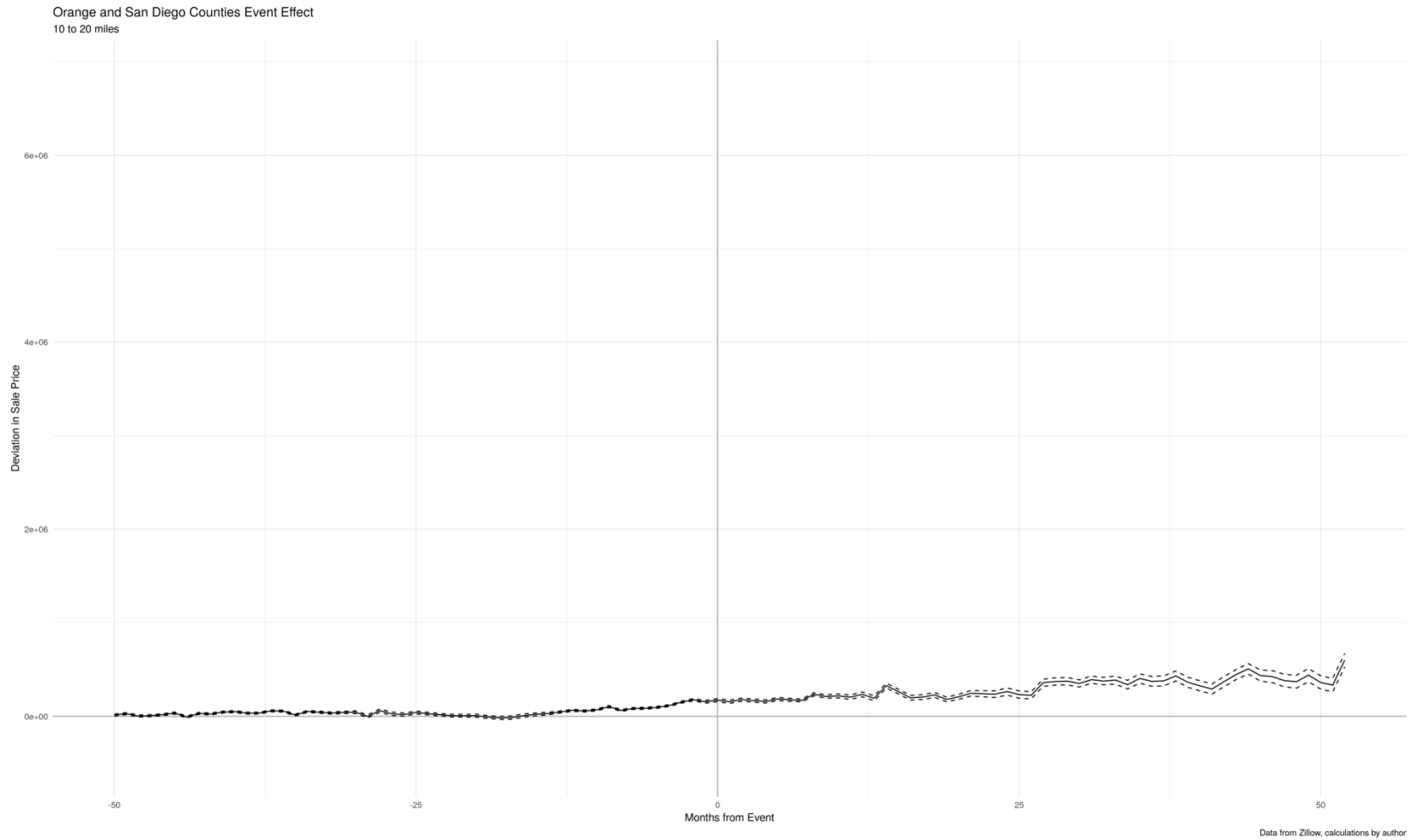


Figure 18: VYNPP Regional Closure Effect, Sales Price

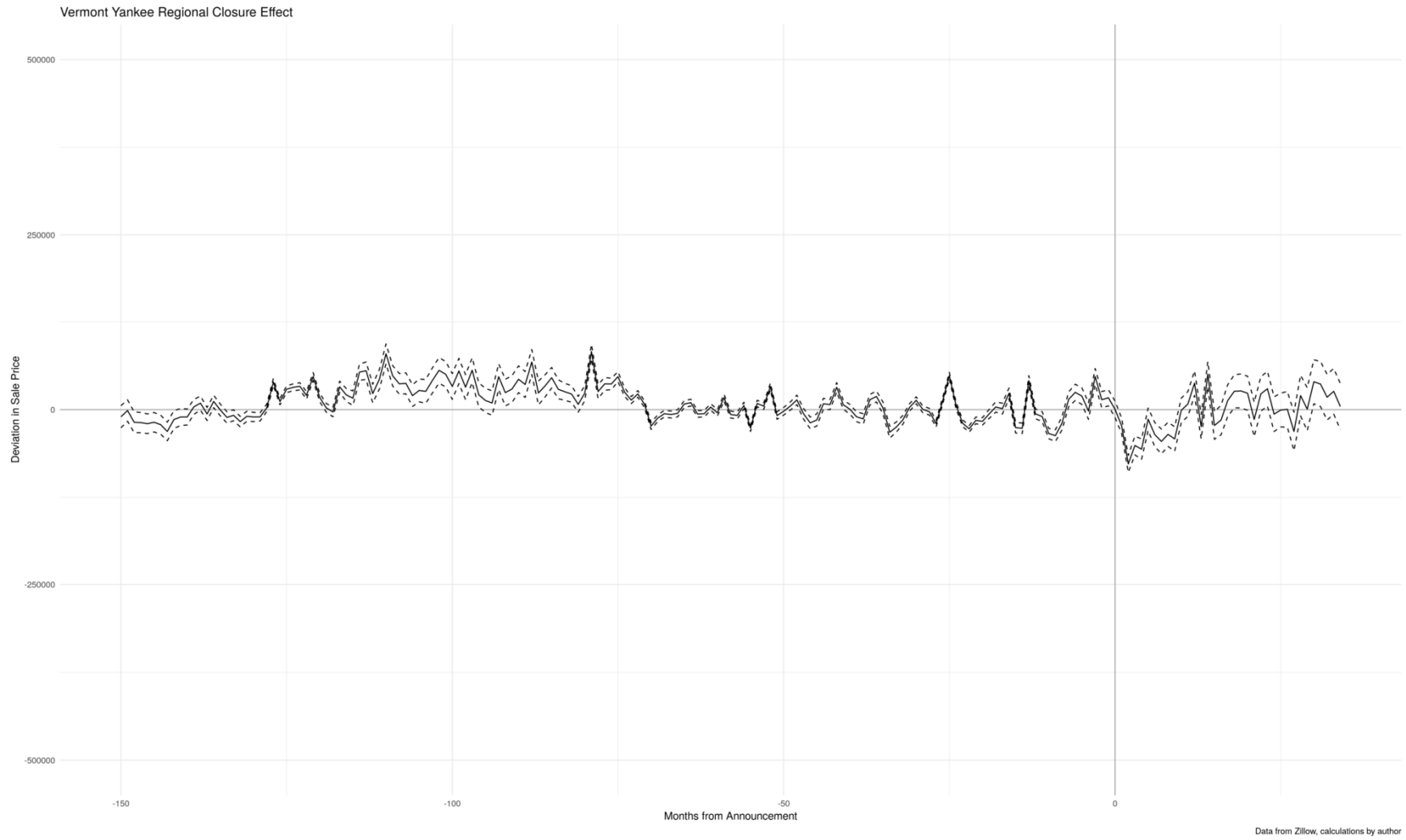


Figure 19: KPS Regional Closure Effect, Sales Price

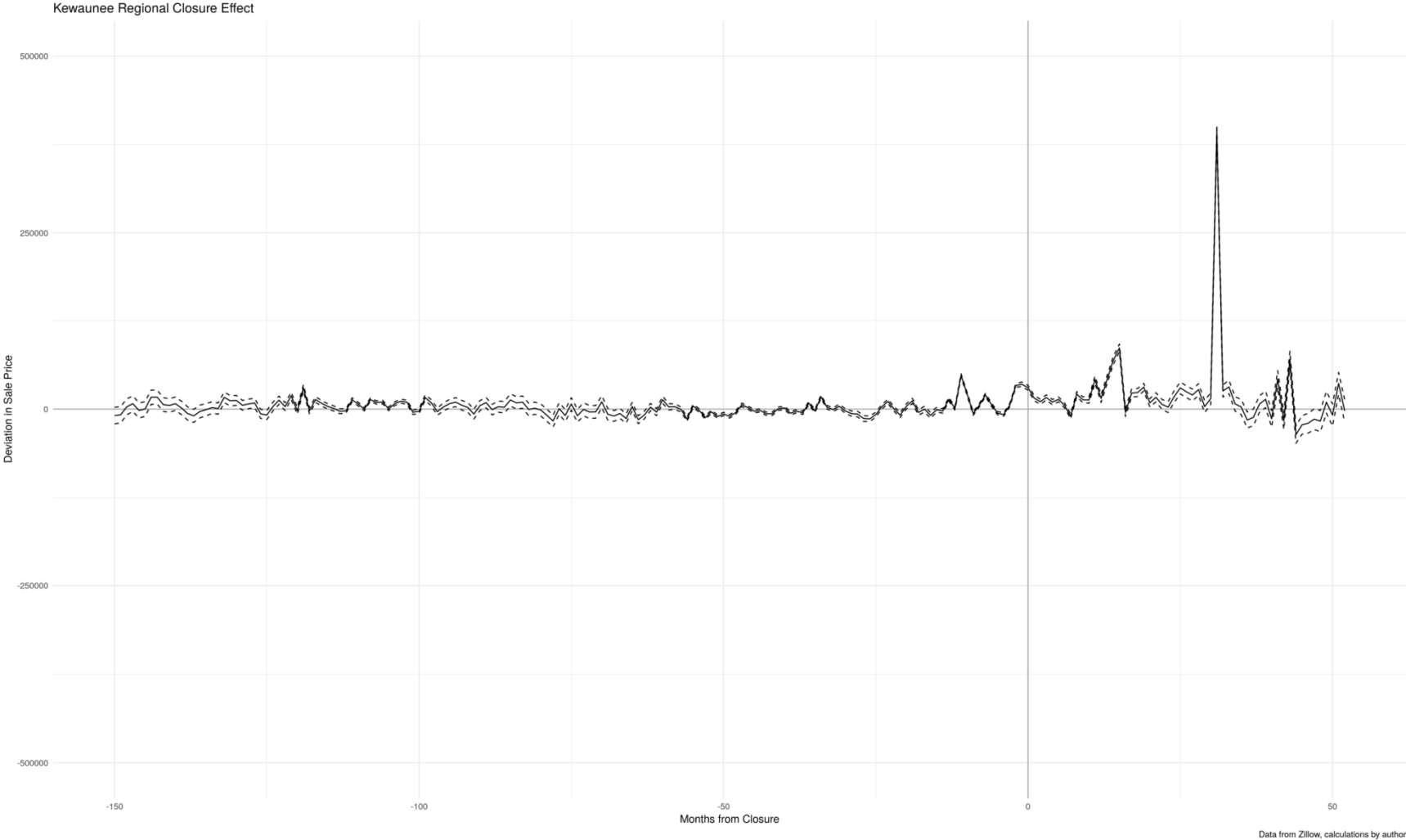
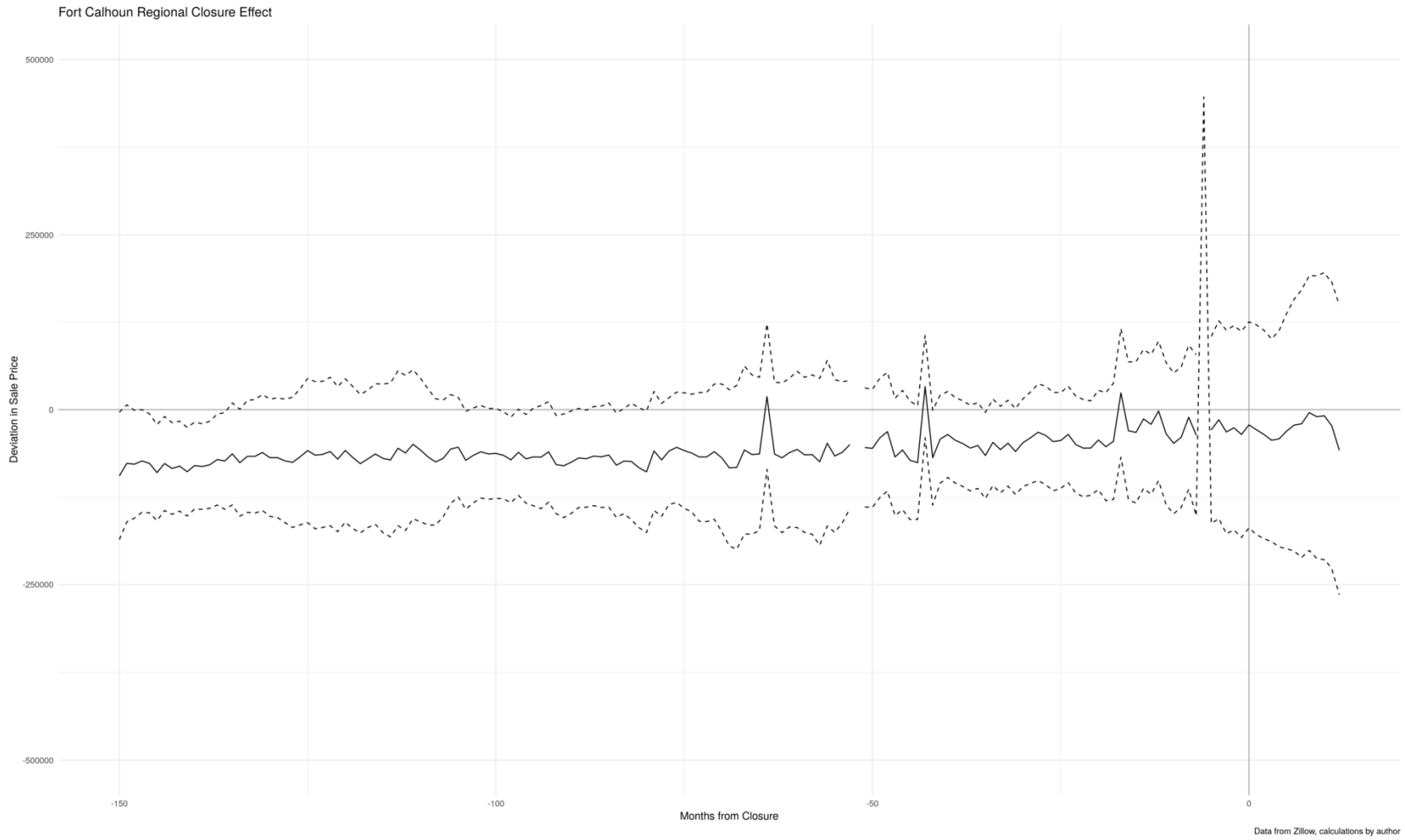


Figure 20: FCNGS Regional Closure Effect, Sales Price



#### 4.4 Conclusions

SLO County's housing market has largely recovered from the adverse macroeconomic cycle that arose in 2008. Housing prices have sustained steady increases over the last decade. Event study of the announcement effect has found no significant impact associated with the closure announcement. For quite similar reasons, we found that the area around SONGS, in San Diego and Orange Counties, has shown no significant impact associated with the closure. Our comparison assessments of other national cases demonstrates the advantages for SLO of diversity and large neighboring economies.



## 5 Bond Market Assessment

### 5.1 Approach

Like real estate values, fiscal resources have been a frequently expressed concern, especially by public sector stakeholders. In our impact assessment (component 1 above), we estimate the direct, indirect, and induced revenue implications of the main DCPD closure effects. Of perhaps even greater significance for SLO public finance, however, is the cost of capital for local public entities. In times when economic sentiments about a regional economy turn negative, bond markets usually send a clear signal by pricing risk into higher bond rates. The effects of this on overall budgets can often be much greater than the loss of individual revenue sources. To ascertain the significance of this for SLO and DCPD, we studied high frequency data on local bond prices econometrically.

One of the chief impacts of the DCPD closure is its fiscal impact on the various government institutions of San Luis Obispo County. In terms of public revenue, the closure of the Diablo Canyon Power Plant is most impactful through the loss of unitary county property taxes paid by PG&E for the power plant and related infrastructure. For the 2018-2019 fiscal year, these taxes totaled \$25,783,066.04, representing 12.58% of total taxes collected by the county and 4.081% of total county revenue.

The loss of a significant revenue stream, as the property taxes from DCPD are commonly posed, would be expected to have an impact on the cost of capital for municipal projects. Specifically, if the unitary taxes from DCPD were considered significant by the bond market, we would expect to see increased interest rates for municipalities affected by the loss (e.g. San Luis Obispo County, the City of San Luis Obispo, San Luis Coastal Unified, 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 little worried about the effect of the public revenue loss on financing. A glance at bond ratings of relevant municipal bonds matches this assessment.

To analyze this econometrically with more rigor, we have used an event study framework common in the financial economics field to look for market indicators of an increasing cost to capital, both analyzing price and rates (through yield-to-maturity rates). Both should provide the same result because of the standard inverse price-yield relationship for bonds (as bond prices increase, bond yields fall and vice versa). The event study framework allows us to compare the observed rates and prices of the selected bonds with predicted values based on historical relationships, to identify if the announcement of the closure caused some deviation in pricing or yields.

This methodology, of course, has its limitations. Its exact precision is, to some extent, dependent on the predictive ability of the input variables. So, increasing predictive power should increase the strength of the analysis. Additionally, the announcement date in 2016 is approximately 10 years before the actual closure date when much of the fiscal impact is to occur and all the bonds should be mature or close to maturity by then, so the market worries about the bonds will naturally be lessened. Nevertheless, we should at least be able to find an indication of market worry if it is present. If there is no generalized movement at all, this would support the conclusions based on interviews and bond ratings.

## 5.2 Methods and Data

Raw data is sourced from Bloomberg Terminal. Price and yield-to-maturity rates are used for each municipal bond. These are compared and predicted using Generic 10-Year Treasury Rates and the Bloomberg Barclays Municipal Bond California Exempt Total Return Index Unhedged. Bonds were analyzed from the following issuing authorities:

- County of San Luis Obispo
- San Luis Obispo County Financing Authority
- San Luis Obispo Public Financing Authority
- San Luis Obispo Capital Improvement Board
- City of San Luis Obispo
- Paso Robles Joint Unified School District
- San Luis Coastal Unified School District

The bond pricing is produced by Bloomberg's BVAL Evaluated Prices because of the relatively infrequent trading of the selected bonds. Such Evaluated Prices are constructed with multiple methods that are then combined to produce a single price, so even when market data is limited, a reliable pricing is still produced. BVAL Data is an industry standard for such evaluated pricing. The date used for the announcement of the closure is Tuesday, June 21, 2016.

Two different versions of the event study are conducted to produce predicted values for comparison. Version 1 is conducted with the corresponding input variable for the prediction regressions (so predicted yields are calculated with the Treasury rates, prices with municipal bond index prices). Version 2 is conducted with both, theoretically providing two points of measurement for the market to improve prediction, both including a standard investment (the Treasury bonds) and a measure of the California municipal bond market. The following regression specifications are used for the respective versions:

Ver. 1 (Yield)  $YieldtoMaturity_{it} = \alpha_{it} + \beta_{it}10yearTreasury_{it} + \gamma_{it}$

Ver. 1 (Price)  $Price_{it} = \alpha_{it} + \beta_{it}CAMunicipalIndex_{it} + \gamma_{it}$

Ver. 2 (Yield)  $YieldtoMaturity_{it} = \alpha_{it} + \beta_{it}10yearTreasury_{it} + \gamma_{it}CAMunicipalIndex_{it} + \delta_{it}$

Ver. 2 (Price)  $Price_{it} = \alpha_{it} + \beta_{it}10yearTreasury_{it} + \gamma_{it}CAMunicipalIndex_{it} + \delta_{it}$

The results of each regression estimation are then used to produce predicted values for each observation of bond rates for each bond. We then find the rate deviation by taking the difference between the observed and predicted values.

To interpret this deviation, take, for example, the bonds put out by the County of San Luis Obispo. A positive rate deviation for one of these bonds indicates that the bond market is experiencing higher rates than one would expect given the 10-year Treasury rate on that day and the recent historical relationship between the two. These higher rates mean the County of San Luis Obispo is considered by the market to be a riskier borrower than would be expected, and thus capital costs for the County would then be higher were they to release a bond at that time.

### 5.3 Results

The results showed little to no announcement effect on yield rates or bond pricing. We see no uniform upward shift in interest rates associated with the announcement nor a uniform downward shift in pricing, as we would expect from a positive shock to the cost of capital. There are no uniform movements, in general. In some individual bonds, there are statistically significant or at least noticeable shifts associated with the announcement date (specifically referring to Version 2 in yields, though these shifts are also present in Version 1 and for prices): 70262RAV Muni, 798703BD5 Muni (downward shifts), 798641AH9 Muni (upward shift). Nonetheless, these shifts quickly return to normal, predicted levels and individual bonds with differing directions do not add up to a generalized shift.

This confirms what we expected based on stakeholder interviews last Fall, where county and city officials reported little concern from their bond agents. Based on this, we can conclude that market expectations for fiscal issues stemming from the decommissioning are low. Theoretically, this is a good indication that fiscal issues will not be significant.

Yield-to-Maturity of Selected Bonds, 2016

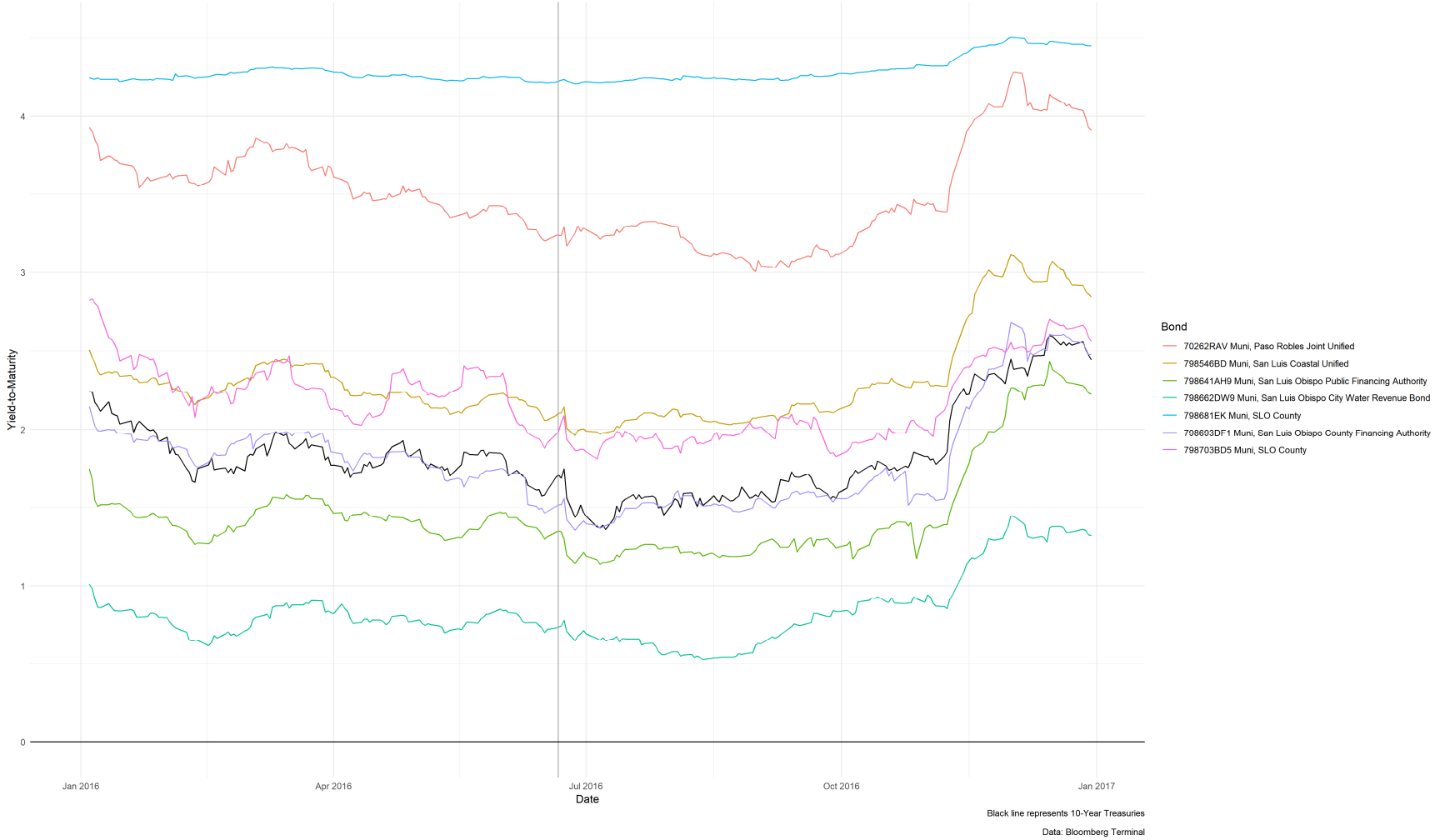
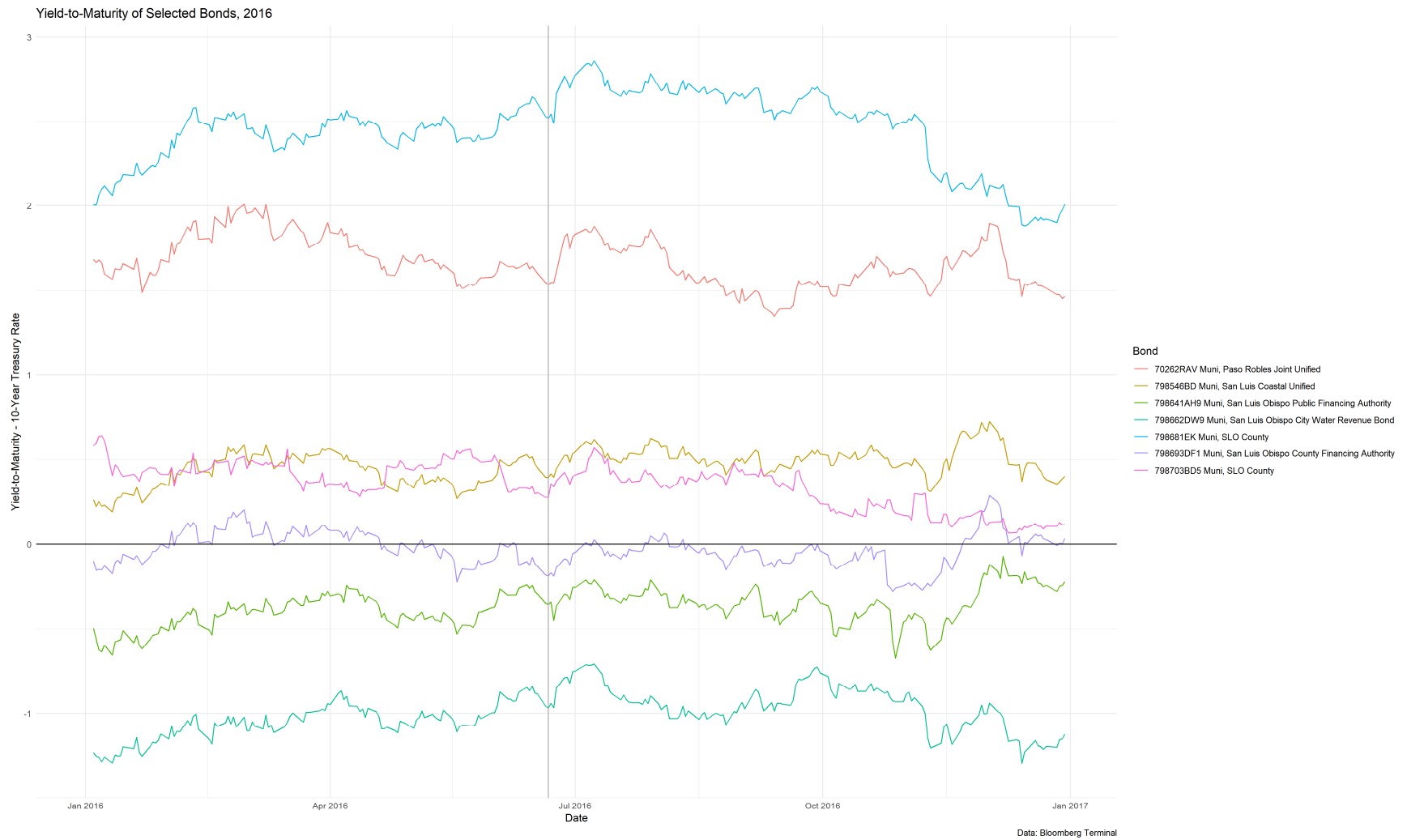
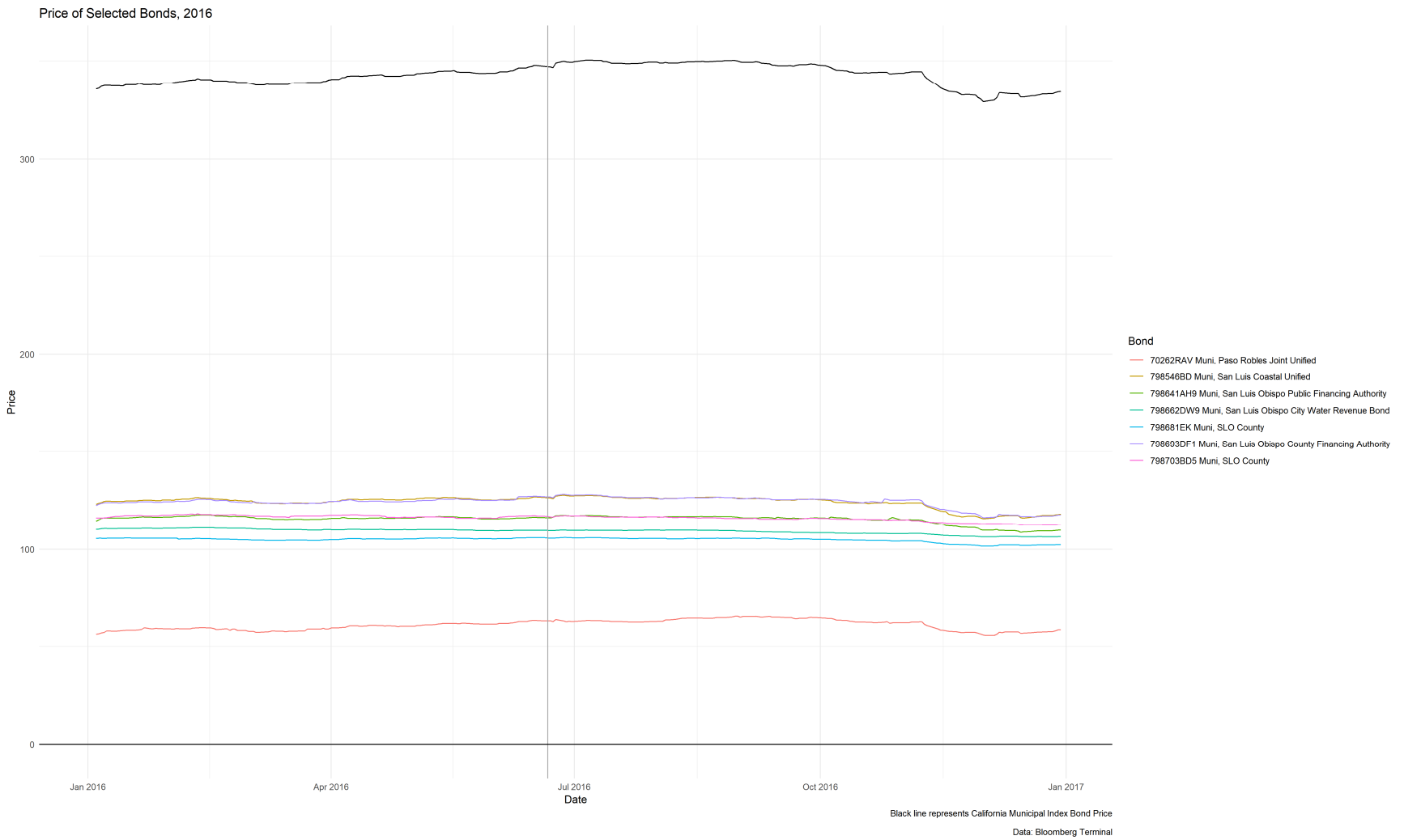


Figure 21: Yields-to-Maturity of San Luis Obispo County Municipal Bonds, 2016

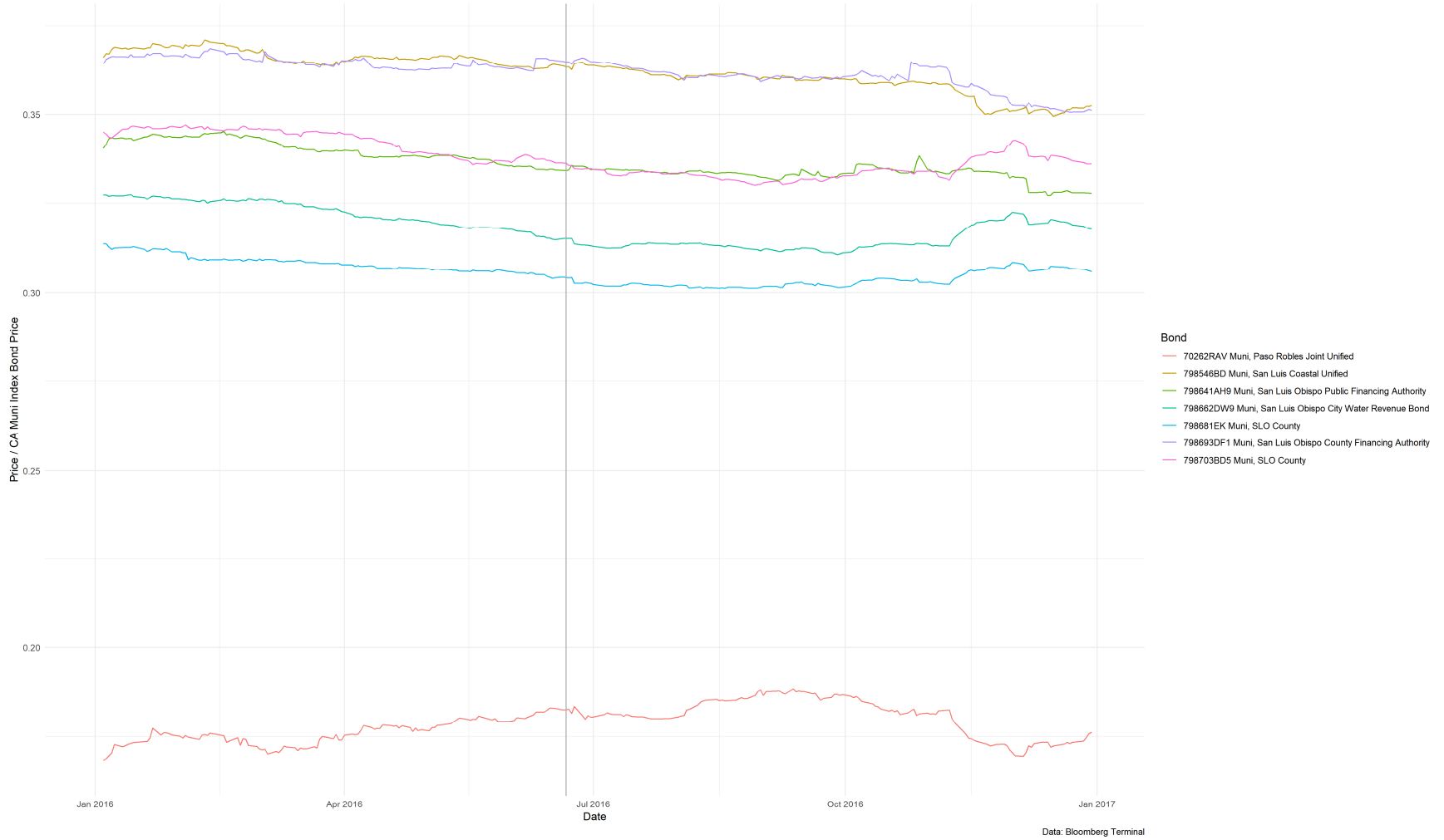


**Figure 22: Difference of Yields-to-Maturity and 10-Year Treasury Rates of San Luis Obispo County Municipal Bonds (Yield Spreads), 2016**



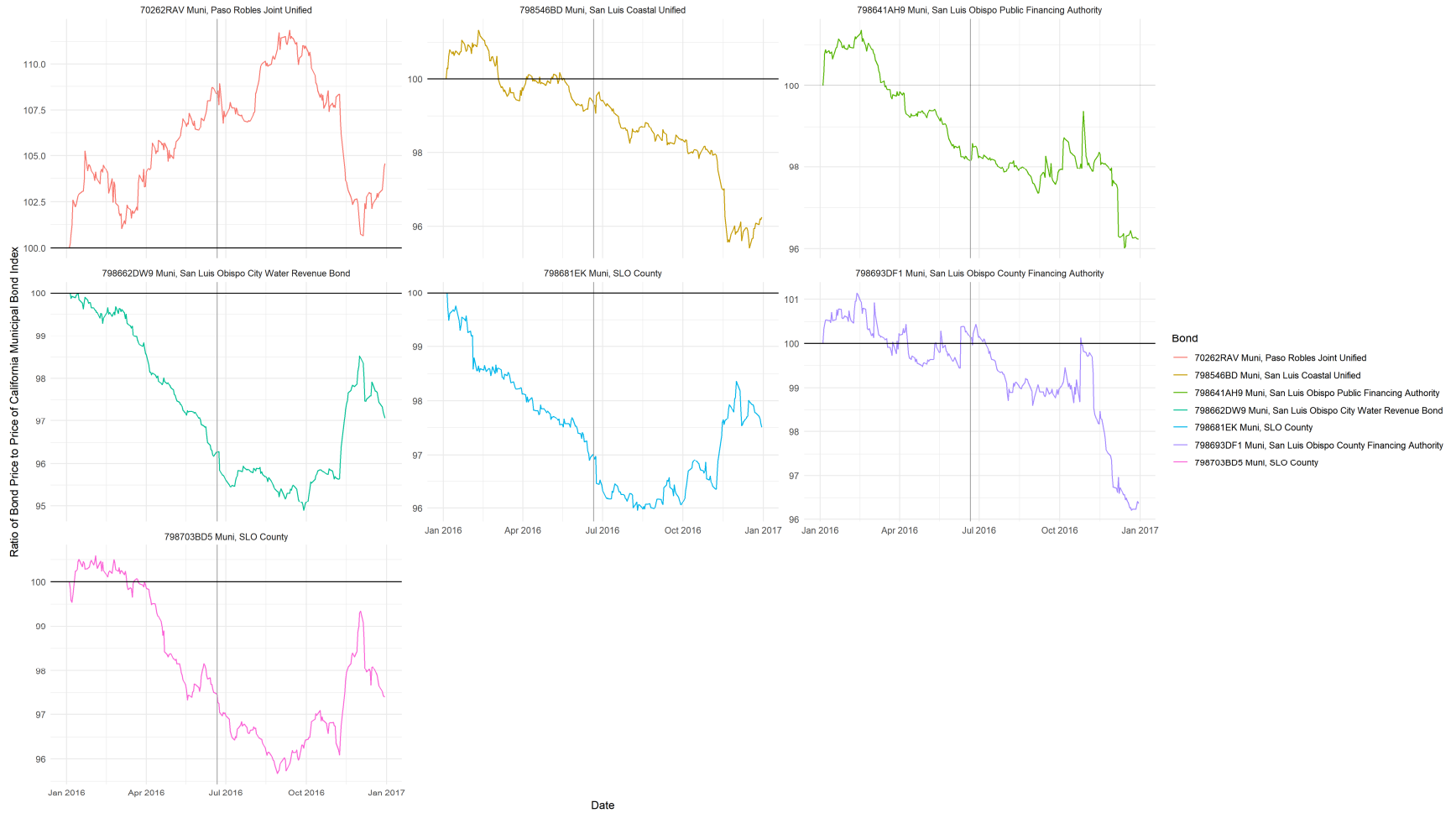
**Figure 23: Bond Prices of San Luis Obispo County Municipal Bonds, 2016**

Price of Selected Bonds, 2016



**Figure 24: Ratio of Bond Prices of San Luis Obispo County Municipal Bonds over Price of a California Municipal Bond Index (Price Ratios), 2016**

Price Ratio of Selected Bonds, 2016  
January 1, 2016 = 100



Data: Bloomberg Terminal, Authors' Calculations

Figure 25: Normalized Price Ratios of San Luis Obispo County Municipal Bonds, 2016



**Yield Spread of Selected Bonds, 2016**  
 January 1, 2016 = 100



Data: Bloomberg Terminal, Authors' Calculations

**Figure 26: Normalized Yield Spreads of San Luis Obispo County Municipal Bonds, 2016**

Event Study, Yield  
Version 1  
Prediction Window: -150 to -30

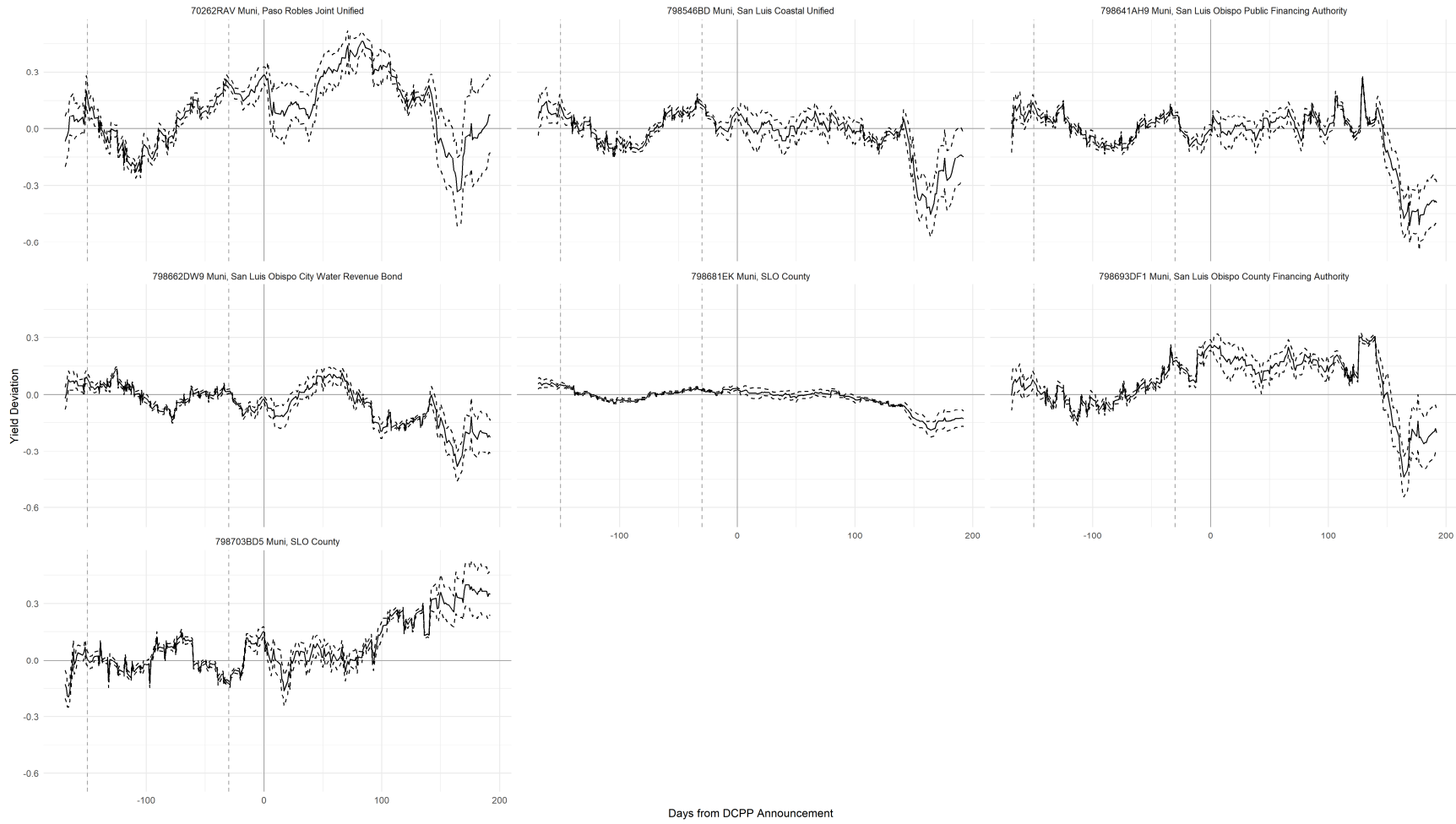


Figure 27: Version 1 Event Studies, Yield

Event Study, Price

Version 1

Prediction Window: -150 to -30

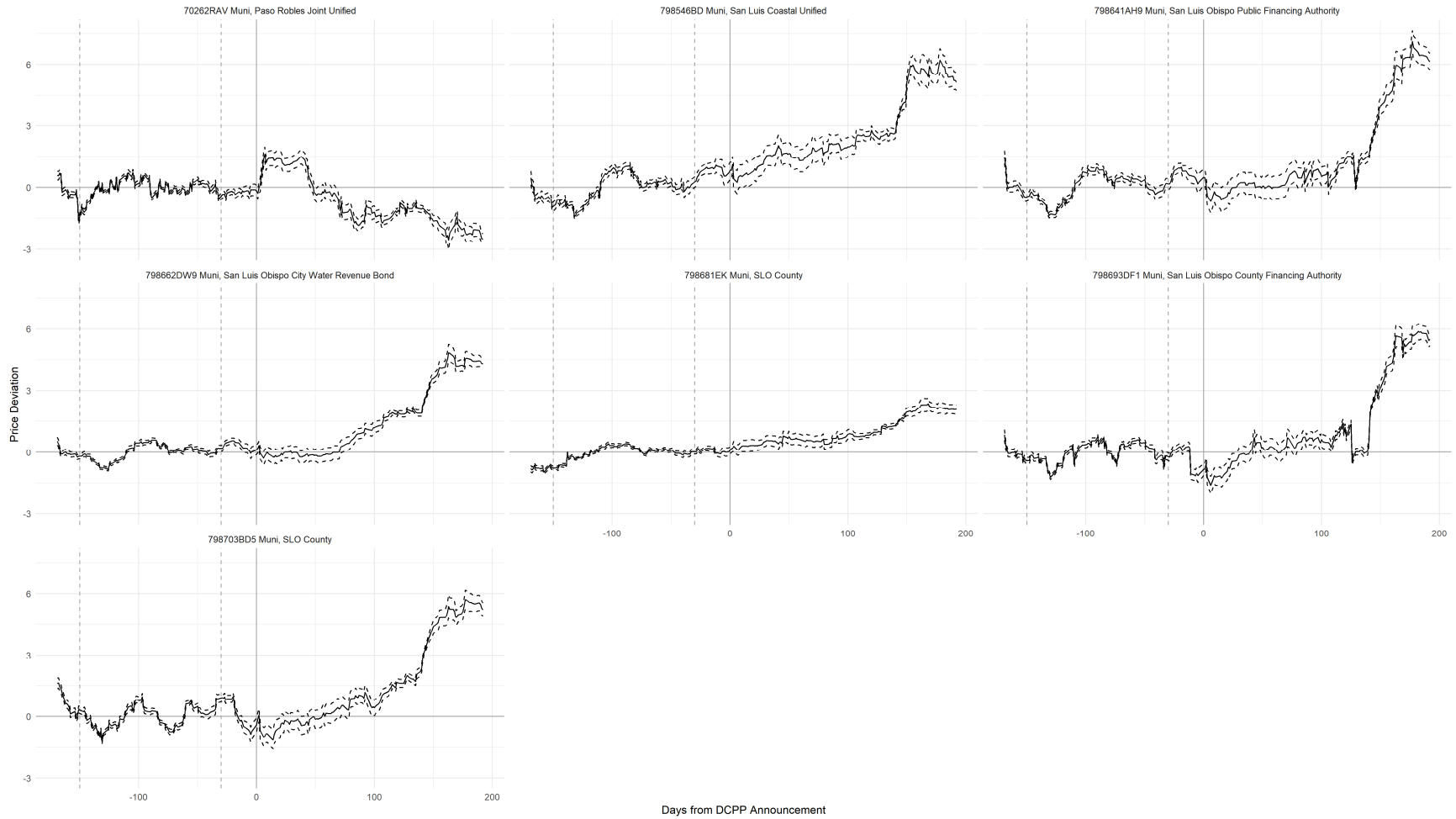


Figure 28: Version 1 Event Study, Price

Event Study, Yield  
Version 2  
Prediction Window: -150 to -30

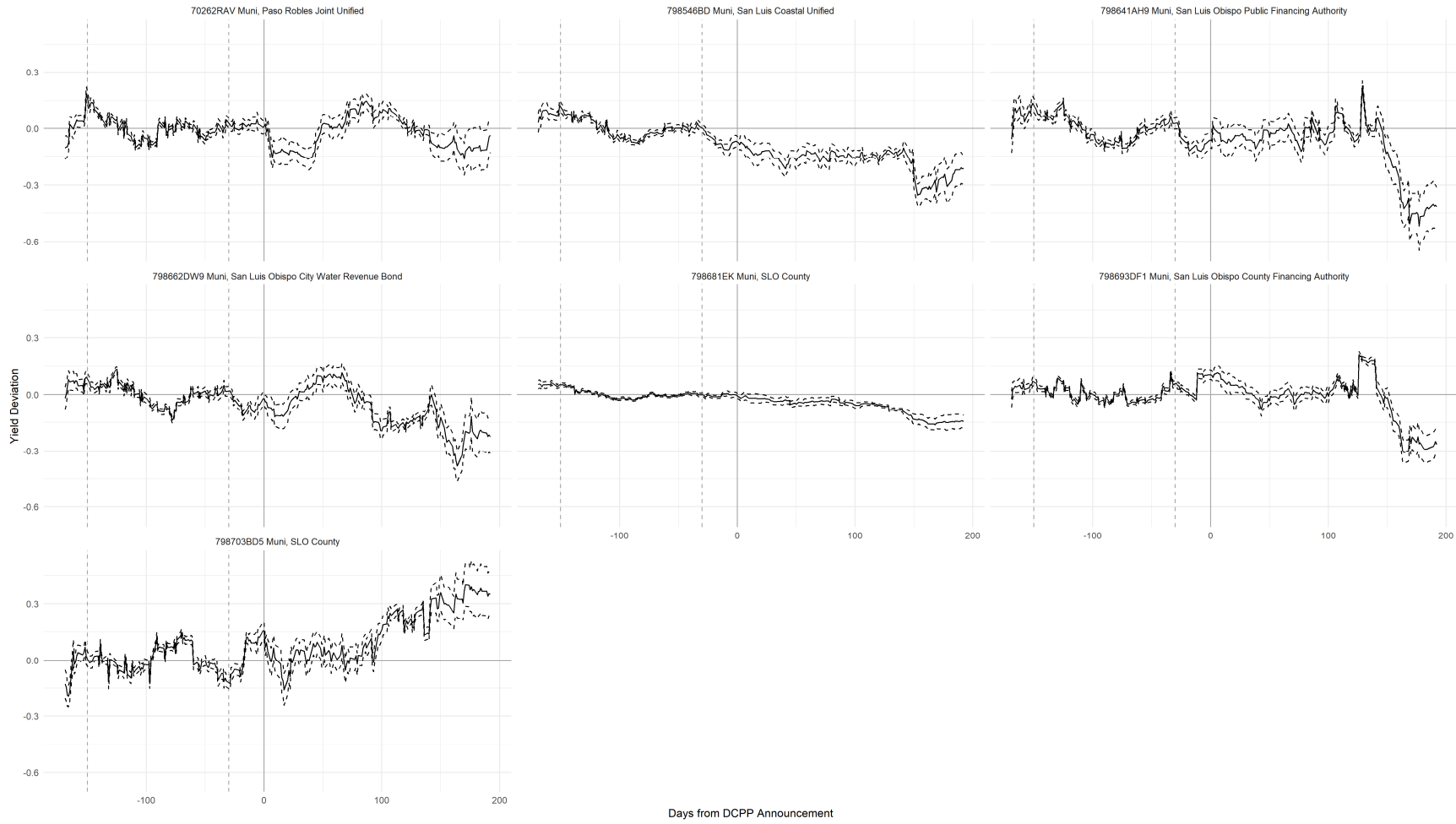


Figure 29: Version 2 Event Study, Yield

Event Study, Price

Version 2

Prediction Window: -150 to -30

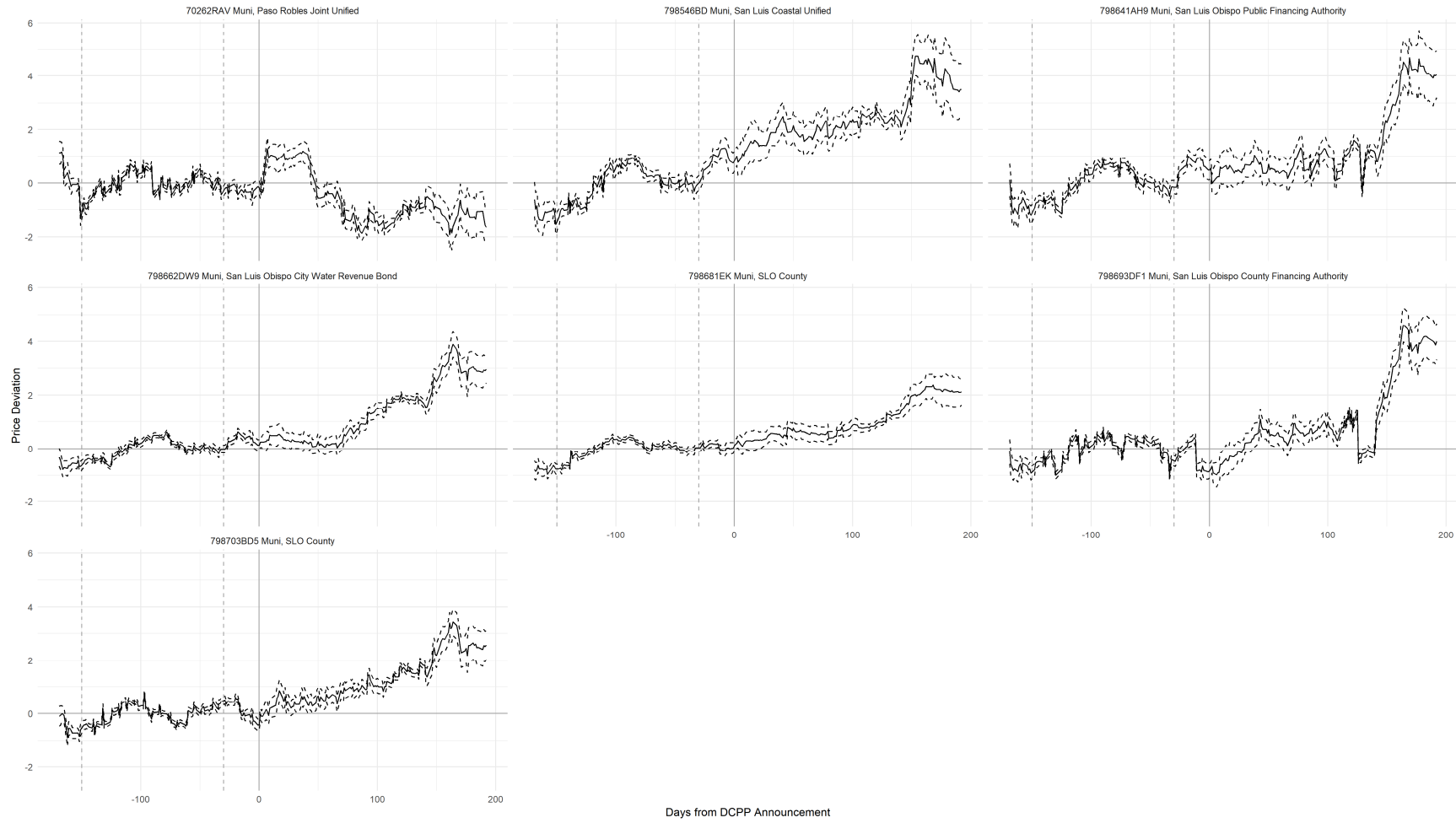


Figure 30: Version 2 Event Study, Price

## 5.4 Conclusions

Despite applying advanced econometric tools to high quality public financial data, we were unable to identify any statistically significant announcement effect attributable to DCPP closure. We take this result as indicating that financial markets do not anticipate a lasting or effect adverse impact on the overall SLO economy.

## 6 Recommendations

In this study to assess local economic impacts of DCPD closure, five different analytical approaches yielded diverse insights about economic risks, rewards, and stakeholder perceptions. Taking the results of this study together, DCPD closure would appear to present as many opportunities as it does challenges. The overall economic impacts of closure will be relatively modest, but significant adjustments can still be expected. Adaptability of the local economy will depend on community resilience, cohesion, and foresight. In this section, we distill some general insights about how to mitigate adjustment costs, capture more economic benefit from investments to retire the site, and improve public awareness. With proactive and coordinated strategies, we believe that SLO can secure the basis for more inclusive and sustainable prosperity.

### 6.1 Recommendations for Civil Society

1. 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 adjustments, however, individualism can be less effective than cooperation. 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. Our survey results suggest that an unintended but valuable benefit of DCPD closure could be a new generation of multi-stakeholder commitment to more sustainable and inclusive growth across the SLO economy.
2. Some of this report's most important findings relate to local (public and private) sentiments aroused by DCPD closure, and discordant expectations over shared values. Shared values provide welcome cohesion, while discordant expectations can stimulate constructive discourse, motivate discovery, and impel the community to improve mutual awareness and cooperation. What is missing is a transparent and inclusive framework to advance community strategic planning.
3. In addition to this study's own economic findings, the stakeholder survey identified leading local concerns and opinions about DCPD. These hallmark issues could be used to jumpstart and sustain dialog for long-term growth. SLO county governments are already pursuing this with dedicated (SB1090) and discretionary funds, including the new Hourglass Project. Evidence like that presented in this study, as well as

other assessments addressing leading community challenges and opportunities, should continue to inform, mobilize, and support SLO in deciding its own future.

## 6.2 Recommendations for Local Governments

1. Clearly align DCPD closure policies with local economic development strategy and communicate this to public and private stakeholders at all levels. Our survey and stakeholder consultations clearly revealed feelings that new economic development opportunities must be more aggressively pursued in order to diversify the economy and attract new businesses, particularly ones that support a high-skilled labor force. California's superior growth for at least two generations has been fuelled by knowledge-intensive industries. SLO has not fulfilled its potential to participate in this dynamic.
2. Facilitate more affordable housing development with significant reductions of impact fees. The incidence of such development fees 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.
3. Redouble enterprise development efforts and their coordination 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. San Luis Obispo could leverage this 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 HotHouse Accelerator and Incubator in downtown San Luis Obispo.
4. Give higher priority to Public Private Partnerships (PPP) with local educational and technology institutions. Cal Poly SLO is a 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.

5. Local governments can contribute to the two essential needs of the SLO housing market:
  - Increasing the share of affordable housing
  - Targeting new, higher wage employers

Permitting for new residential construction can be restrictive and several stakeholders felt this was a serious barrier to diversifying the residential market. Many who work in the service and public sector are unable to afford much of the existing housing stock. More coordinated, proactive community marketing is needed to improve the investment climate for these two priorities

6. Commit to complementary local investments and institutional development to achieve more inclusive gains from DCPD closure. These initiatives should include public and private capacity development, financial and fiscal consideration for local enterprises, and labor force development.
7. An often-overlooked, but nonetheless-important, work barrier is childcare access and affordability. Younger workers are disinclined to move into or stay 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. Governor Gavin Newsom has already put in motion a plan to achieve universal pre-K for low-income families across the state over the next four years, but the city and county governments can act further to support middle-income and professional families, increase the supply of pre-K seats, and even accelerate the pace of pre-K provisions for low-income families. One model for this could be Aspen, Colorado, which uses a dedicated sales tax to help fund childcare programs and offer aid to lower-income families.
8. Work with state agencies and private investors to locally source carbon-free DCPD-displacement energy and take proactive steps toward approval by the Bureau of Ocean Energy Management (BOEM) of offshore wind farms in the Diablo Canyon and Morro Bay call areas. For Diablo Canyon, such a

development could significantly mitigate redevelopment costs by making use of existing grid infrastructure at the DCPD site while also providing employment opportunities in job sectors similar to DCPD. Department of Defense (DOD) wind exclusion zoning is currently the most significant roadblock to BOEM approval. Recent reporting has indicated the Diablo Canyon call area is less likely to receive a DOD go-ahead, but development of the Morro Bay call area would still be positive for the regional economy.

### 6.3 Recommendations for the CPUC

1. Cooperate with local governments and PG&E to directly monitor operations related to DCPD closure, and measure and publicize progress according to explicit and mutually agreed initial goals and metrics.
2. Limit the overall timeframe for DCPD decommissioning. In particular, use as a reference the DECON+ option for decommissioning, which would finish the process within an expected 10 years, unlike the SAFSTOR alternative which could take up to 60 years to complete. A shorter timeframe would better concentrate and front-load decommissioning spending while simultaneously allowing for timely redevelopment and reuse of the DCPD land and infrastructure. Notably, this suggestion is in agreement with the Diablo Canyon Engagement Panel's recommendations.

### 6.4 Recommendations for PG&E

1. Our assessment results suggest there is significant uncertainty in the SLO community regarding economic 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 independent 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.
2. PG&E's long commitment to SLO can be sustained with a clearly articulated set of priorities for local contracting for goods and services connected with DCPD decommissioning. Subject to acceptable minimum standards, preference can be given to competitive local suppliers or joint venture partners who agree to work with local firms and labor force development institutions. In recognition of the

multiplier benefits of such local expenditures, SLO governments and agencies may want to consider incentives to promote such partnerships.

## 7 References

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## 8 Appendix 1 - Local Stakeholder Survey Questionnaire

The following tables contain the content of all questions asked in the DCPP Local Stakeholder Survey. Respondents filled out their responses online, but the question content is the same. All respondents answered the questions under "General Information" on p. 1. Their answer to the question "How would you describe your organization?" then decided whether they would answer the questions for "Private Business" (pp. 2 and 5), "Non-governmental Organizations" (pp. 3 and 6), or "Public Administration / Government" (pp. 4 and 7)

**General Information (p. 1)**

What is your birth year?

Open-Ended

What is your organization's name (if applicable)?

Open-Ended

How would you describe your organization?

Private enterprise

Non-governmental organization

Public administration / government

How would you classify your organization according to the North American Industry Classification System or NAICS?

11: Agriculture, Forestry, Fishing and Hunting

21: Mining, Quarrying, and Oil and Gas Extraction

22: Utilities

23: Construction

31-33: Manufacturing

42: Wholesale Trade

44-45: Retail Trade

48-49: Transportation and Warehousing

51: Information

52: Finance and Insurance

53: Real Estate and Rental and Leasing

54: Professional, Scientific, and Technical Services

55: Management of Companies and Enterprises

56: Administrative and Support and Waste Management and Remediation Services

61: Educational Services

62: Health Care and Social Assistance

71: Arts, Entertainment, and Recreation

72: Accommodation and Food Services

81: Other Services (except Public Administration)

92: Public Administration

How would you describe your position?

Independent Individual

Owner

Administrator

Middle Management

Operations

General Outlook, Private Business (p.2)									
Compared to this time last year (March 2018), has the number of full-time equivalent employees in your firm increased, decreased, or stayed the same?					Compared to this time five years ago (March 2014), has the number of full-time equivalent employees in your firm increased, decreased, or stayed the same?				
Decreased		0		Decreased		0			
Stayed the same		0.5		Stayed the same		0.5			
Increased		1		Increased		1			
Compared to this time last year (March 2018), has the number or total quantity of new orders to your firm increased, decreased, or stayed the same?					Compared to this time five years ago (March 2014), has the number or total quantity of new orders to your firm increased, decreased, or stayed the same?				
Decreased		0		Decreased		0			
Stayed the same		0.5		Stayed the same		0.5			
Increased		1		Increased		1			
Compared to this time last year (March 2018), were your firm's dollar sales higher or lower?					Compared to this time last year (March 2014), were your firm's dollar sales higher or lower?				
Decreased		0		Decreased		0			
Stayed the same		0.5		Stayed the same		0.5			
Increased		1		Increased		1			
Please indicate how much you agree or disagree with the following statements about San Luis Obispo County:									
"San Luis Obispo County has a robust, vibrant economy."									
"Housing prices are having a negative impact on the local economy."									
"Marketing and attraction of job candidates is a persistent issue in the county."									
"Economic anchors like DCPD or CalPoly benefit the economy, but also allow county residents to be complacent about long-term growth challenges."									
"San Luis Obispo County suffers from an 'affordability' gap of low wages and high housing costs."									
<b>Options</b>		<b>Values</b>		<b>"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"</b>					
Agree		4							
Somewhat agree		3							
Neither agree nor disagree		2							
Somewhat disagree		1							
Disagree		0							

General Outlook, Non-governmental Organizations (p.3)			
How would you describe your organization's purpose?			
Environmental			
Health			
Education			
Labor			
Community Action			
Economic Development			
Other (please specify)			
Please indicate how much you agree or disagree with the following statements about San Luis Obispo County:			
"San Luis Obispo County has a robust, vibrant economy."			
"Housing prices are having a negative impact on the local economy."			
"Marketing and attraction of job candidates is a persistent issue in the county."			
"Economic anchors like DCPD or CalPoly benefit the economy, but also allow county residents to be complacent about long-term growth challenges."			
"San Luis Obispo County suffers from an 'affordability' gap of low wages and high housing costs."			
<b>Options</b>		<b>Values</b>	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Agree		4	
Somewhat agree		3	
Neither agree nor disagree		2	
Somewhat disagree		1	
Disagree		0	

General Outlook, Public Administration / Government (p.4)			
At what level of government would you place your organization?			
Local			
State			
Federal			
Please indicate how much you agree or disagree with the following statements about San Luis Obispo County:			
"San Luis Obispo County has a robust, vibrant economy."			
"Housing prices are having a negative impact on the local economy."			
"Marketing and attraction of job candidates is a persistent issue in the county."			
"Economic anchors like DCPD or CalPoly benefit the economy, but also allow county residents to be complacent about long-term growth challenges."			
"San Luis Obispo County suffers from an 'affordability' gap of low wages and high housing costs."			
<b>Options</b>		<b>Values</b>	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Agree		4	
Somewhat agree		3	
Neither agree nor disagree		2	
Somewhat disagree		1	
Disagree		0	



**Closure of the Diablo Canyon Power Plant, Private Business (p. 5)**

On June 21, 2016, PG&E announced its decision to close the Diablo Canyon (Nuclear) Power Plant (DCPP) near Avila Beach in San Luis Obispo County. The plant's two reactors will be shut down in 2024 and 2025. DCPD employs around 1500 employees, has a local payroll of around \$200 million, and pays around \$26 million a year in unitary property tax. The following questions pertain to this closure.

Please identify the importance of the following concerns regarding the impact of the DCPD closure on your business:

Business Environment																				
Labor Availability																				
Material Costs																				
Labor Costs																				
Utility Costs																				
Rental Rates																				
Property Values																				
Public Goods and Services																				
Other (please specify)																				

Please identify the importance of the following concerns regarding the impact of the DCPD closure on the local economy:

Economic uncertainty																				
Loss of tax revenue																				
Loss of jobs																				
Emigration																				
Electricity costs																				
Other (please specify)																				

Options	Values
Very important	3
Somewhat important	2
Not important	1

Following the closure, do you expect your firm's primary business to fare better, worse, or stay the same?

Better																				
About the same																				
Worse																				

Please indicate how much you would either agree or disagree with the following statements about the Diablo Canyon Power Plant closure:

"The loss of this large local employer will have a severe negative impact on the local economy."

"The County is embedded in a diversified and robust regional economy. Decommissioning will open more opportunities for modernization and skill-intensive growth."

"Government services such as schools or public transit will be severely impacted by the loss of tax revenue."

"PG&E employees are active community members, losing them would have a substantial negative impact on the community."

"Heavy vehicle traffic from decommissioning will have a significant detrimental impact on local roads and economic activity."

Options	Values	
Agree	4	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Somewhat agree	3	
Neither agree nor disagree	2	
Somewhat disagree	1	
Disagree	0	

On September 19, 2018, then-Governor Jerry Brown signed Senate Bill No. 1090, directing the California Public Utilities Commission to approve a settlement which includes \$85 million to mitigate the impacts of the closure (\$75 million distributed among local governments and \$10 million to be spent on economic development). The full text of the bill can be read [here](#). Prior to now, were you aware of this bill?

Yes

No

Various uses have been proposed for the \$10 million in economic development funds approved by SB 1090. Please indicate how you feel about some possible uses of these funds:

Job training programs for local workers

Marketing and recruitment of new workers and their families

Marketing and recruitment of new businesses

Retention programs for graduates of CalPoly SLO and Cuesta College

Investment incentives for technology clusters

Infrastructure investment (roads, public transit)

Budgetary adjustment assistance for local governments

Other (please specify)

Options	Values	
Agree	4	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Somewhat agree	3	
Neither agree nor disagree	2	
Somewhat disagree	1	
Disagree	0	

The Diablo Canyon Power Plant sits on 12,000 acres of undeveloped land, with 14 miles of Pacific coastline between Montaña de Oro State Park and the City of Avila Beach. After the closure of DCP, how would you rank the following general redevelopment configurations?

- Full Recreation / Conservation
- Partial Recreation / Conservation
- Partial Commercialization
- Partial Residential
- Full Commercialization
- Full Residential
- Full Mixed Commercial / Residential

After announcing the closure, PG&E convened the Diablo Canyon Decommissioning Engagement Panel "to foster open and transparent dialogue between members of the local community and PG&E". Since its creation, the panel has held public meetings and workshops, conducted tours of Diablo Canyon lands, and published recommendations as to the decommissioning process. Prior to now, did you know of this panel's existence and activities?

- Yes, I participated in the panel's activities.
- Yes, I was aware of the panel but did not participate.
- No, I was not aware.

The Diablo Canyon Decommissioning Engagement Panel published a set of recommendations on January 8, 2019. The recommendations are reproduced below, and the full report can be read here. Please indicate your level of agreement or disagreement with these recommendations:

The decommissioning (decontamination) process should begin immediately upon shutdown with a goal of 10 years for completion of radiological decommissioning and decontamination, avoiding SAFSTOR (which allows up to 60-year delay in decontamination)

The health and safety of the community and the environmental quality of the area should be the primary consideration when evaluating cost-effective methods of decommissioning in order to save ratepayers money

The 12,000 acres that surround the DCP are a spectacular natural resource and need to be conserved in perpetuity while allowing for managed public access and use

The repurposing of facilities should be explored as a way to both reduce the amount of demolition materials created and create opportunities for new local jobs and economic development while considering public safety, traffic concerns and the environmental quality of the region

The engagement panel should be in a form that would lead to the best possible recommendations on achieving a safe and effective decommissioning of the DCP, including the disposition of Diablo Canyon Lands and Facilities

Options	Values	
Agree	4	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Somewhat agree	3	
Neither agree nor disagree	2	
Somewhat disagree	1	
Disagree	0	

**Closure of the Diablo Canyon Power Plant, Non-governmental Organizations (p. 6)**

On June 21, 2016, PG&E announced its decision to close the Diablo Canyon (Nuclear) Power Plant (DCPP) near Avila Beach in San Luis Obispo County. The plant's two reactors will be shut down in 2024 and 2025. DCPPEmploys around 1500 employees, has a local payroll of around \$200 million, and pays around \$26 million a year in unitary property tax. The following questions pertain to this closure.

Please identify the importance of the following concerns regarding the impact of the DCPPE closure on the local economy:

Economic uncertainty										
Loss of tax revenue										
Loss of jobs										
Emigration										
Electricity costs										
Other (please specify)										

Options	Values
Very important	3
Somewhat important	2
Not important	1

Following the closure, do you expect your firm's primary business to fare better, worse, or stay the same?

Better										
About the same										
Worse										

Please indicate how much you would either agree or disagree with the following statements about the Diablo Canyon Power Plant closure:

"The loss of this large local employer will have a severe negative impact on the local economy."										
"The County is embedded in a diversified and robust regional economy. Decommissioning will open more opportunities for modernization and skill-intensive growth."										
"Government services such as schools or public transit will be severely impacted by the loss of tax revenue."										
"PG&E employees are active community members, losing them would have a substantial negative impact on the community."										
"Heavy vehicle traffic from decommissioning will have a significant detrimental impact on local roads and economic activity."										

Options	Values	
Agree	4	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Somewhat agree	3	
Neither agree nor disagree	2	
Somewhat disagree	1	
Disagree	0	

On September 19, 2018, then-Governor Jerry Brown signed Senate Bill No. 1090, directing the California Public Utilities Commission to approve a settlement which includes \$85 million to mitigate the impacts of the closure (\$75 million distributed among local governments and \$10 million to be spent on economic development). The full text of the bill can be read here. Prior to now, were you aware of this bill?

Yes																			
No																			

Various uses have been proposed for the \$10 million in economic development funds approved by SB 1090. Please indicate how you feel about some possible uses of these funds:

Job training programs for local workers																			
Marketing and recruitment of new workers and their families																			
Marketing and recruitment of new businesses																			
Retention programs for graduates of CalPoly SLO and Cuesta College																			
Investment incentives for technology clusters																			
Infrastructure investment (roads, public transit)																			
Budgetary adjustment assistance for local governments																			
Other (please specify)																			

Options	Values	
Agree	4	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Somewhat agree	3	
Neither agree nor disagree	2	
Somewhat disagree	1	
Disagree	0	

The Diablo Canyon Power Plant sits on 12,000 acres of undeveloped land, with 14 miles of Pacific coastline between Montaña de Oro State Park and the City of Avila Beach. After the closure of DCP, how would you rank the following general redevelopment configurations?

Full Recreation / Conservation																			
Partial Recreation / Conservation																			
Partial Commercialization																			
Partial Residential																			
Full Commercialization																			
Full Residential																			
Full Mixed Commercial / Residential																			

After announcing the closure, PG&E convened the Diablo Canyon Decommissioning Engagement Panel "to foster open and transparent dialogue between members of the local community and PG&E". Since its creation, the panel has held public meetings and workshops, conducted tours of Diablo Canyon lands, and published recommendations as to the decommissioning process. Prior to now, did you know of this panel's existence and activities?

Yes, I participated in the panel's activities.																			
Yes, I was aware of the panel but did not participate.																			
No, I was not aware.																			

The Diablo Canyon Decommissioning Engagement Panel published a set of recommendations on January 8, 2019. The recommendations are reproduced below, and the full report can be read here. Please indicate your level of agreement or disagreement with these recommendations:

The decommissioning (decontamination) process should begin immediately upon shutdown with a goal of 10 years for completion of radiological decommissioning and decontamination, avoiding SAFSTOR (which allows up to 60-year delay in decontamination)																			
The health and safety of the community and the environmental quality of the area should be the primary consideration when evaluating cost-effective methods of decommissioning in order to save ratepayers money																			
The 12,000 acres that surround the DCP are a spectacular natural resource and need to be conserved in perpetuity while allowing for managed public access and use																			
The repurposing of facilities should be explored as a way to both reduce the amount of demolition materials created and create opportunities for new local jobs and economic development while considering public safety, traffic concerns and the environmental quality of the region																			
The engagement panel should be in a form that would lead to the best possible recommendations on achieving a safe and effective decommissioning of the DCP, including the disposition of Diablo Canyon Lands and Facilities																			
<b>Options</b>					<b>Values</b>														
Agree					4					"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"									
Somewhat agree					3														
Neither agree nor disagree					2														
Somewhat disagree					1														
Disagree					0														

**Closure of the Diablo Canyon Power Plant, Public Administration / Government (p. 7)**

On June 21, 2016, PG&E announced its decision to close the Diablo Canyon (Nuclear) Power Plant (DCPP) near Avila Beach in San Luis Obispo County. The plant's two reactors will be shut down in 2024 and 2025. DCPD employs around 1500 employees, has a local payroll of around \$200 million, and pays around \$26 million a year in unitary property tax. The following questions pertain to this closure.

Please identify the importance of the following concerns regarding the impact of the DCPD closure on the local economy:

Economic uncertainty										
Loss of tax revenue										
Loss of jobs										
Emigration										
Electricity costs										
Other (please specify)										
<b>Options</b>										
Very important										3
Somewhat important										2
Not important										1

Following the closure, do you expect your firm's primary business to fare better, worse, or stay the same?

Better										
About the same										
Worse										

Please indicate how much you would either agree or disagree with the following statements about the Diablo Canyon Power Plant closure:

"The loss of this large local employer will have a severe negative impact on the local economy."											
"The County is embedded in a diversified and robust regional economy. Decommissioning will open more opportunities for modernization and skill-intensive growth."											
"Government services such as schools or public transit will be severely impacted by the loss of tax revenue."											
"PG&E employees are active community members, losing them would have a substantial negative impact on the community."											
"Heavy vehicle traffic from decommissioning will have a significant detrimental impact on local roads and economic activity."											
<b>Options</b>											
Agree										4	"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"
Somewhat agree										3	
Neither agree nor disagree										2	
Somewhat disagree										1	
Disagree										0	

On September 19, 2018, then-Governor Jerry Brown signed Senate Bill No. 1090, directing the California Public Utilities Commission to approve a settlement which includes \$85 million to mitigate the impacts of the closure (\$75 million distributed among local governments and \$10 million to be spent on economic development). The full text of the bill can be read here. Prior to now, were you aware of this bill?

Yes

No

Various uses have been proposed for the \$10 million in economic development funds approved by SB 1090. Please indicate how you feel about some possible uses of these funds:

Job training programs for local workers

Marketing and recruitment of new workers and their families

Marketing and recruitment of new businesses

Retention programs for graduates of CalPoly SLO and Cuesta College

Investment incentives for technology clusters

Infrastructure investment (roads, public transit)

Budgetary adjustment assistance for local governments

Other (please specify)

**Options**

**Values**

Agree

4

"Percent Agree" takes the percentage of respondents answering

Somewhat agree

3

"Agree" or "Somewhat agree"

Neither agree nor disagree

2

Somewhat disagree

1

Disagree

0

The Diablo Canyon Power Plant sits on 12,000 acres of undeveloped land, with 14 miles of Pacific coastline between Montaña de Oro State Park and the City of Avila Beach. After the closure of DCP, how would you rank the following general redevelopment configurations?

Full Recreation / Conservation

Partial Recreation / Conservation

Partial Commercialization

Partial Residential

Full Commercialization

Full Residential

Full Mixed Commercial / Residential

After announcing the closure, PG&E convened the Diablo Canyon Decommissioning Engagement Panel "to foster open and transparent dialogue between members of the local community and PG&E". Since its creation, the panel has held public meetings and workshops, conducted tours of Diablo Canyon lands, and published recommendations as to the decommissioning process. Prior to now, did you know of this panel's existence and activities?

Yes, I participated in the panel's activities.

Yes, I was aware of the panel but did not participate.

No, I was not aware.



The Diablo Canyon Decommissioning Engagement Panel published a set of recommendations on January 8, 2019. The recommendations are reproduced below, and the full report can be read here. Please indicate your level of agreement or disagreement with these recommendations:

The decommissioning (decontamination) process should begin immediately upon shutdown with a goal of 10 years for completion of radiological decommissioning and decontamination, avoiding SAFSTOR (which allows up to 60-year delay in decontamination)																			
The health and safety of the community and the environmental quality of the area should be the primary consideration when evaluating cost-effective methods of decommissioning in order to save ratepayers money																			
The 12,000 acres that surround the DCP are a spectacular natural resource and need to be conserved in perpetuity while allowing for managed public access and use																			
The repurposing of facilities should be explored as a way to both reduce the amount of demolition materials created and create opportunities for new local jobs and economic development while considering public safety, traffic concerns and the environmental quality of the region																			
The engagement panel should be in a form that would lead to the best possible recommendations on achieving a safe and effective decommissioning of the DCP, including the disposition of Diablo Canyon Lands and Facilities																			
<b>Options</b>					<b>Values</b>														
Agree					4					"Percent Agree" takes the percentage of respondents answering "Agree" or "Somewhat agree"									
Somewhat agree					3														
Neither agree nor disagree					2														
Somewhat disagree					1														
Disagree					0														

## 9 Appendix 2 – Additional Macroeconomic Results

### 9.1 Component Impact Estimates for the Core Scenarios

This appendix contains a variety of supplemental results, including more detailed impacts for the core scenario (\$4.8 billion decommissioning budget), and spatial detail for impacts in Santa Barbara County and the rest of California.

#### 9.1.1 Impact Decomposition for SB 1090 ESMF

**Table A - 56: Annual Economic Impact of SB 1090 ESMF and DCPD Employee Retention, San Luis Obispo County, (2016 Dollars Annually for 7 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	96	\$7,239,070	\$9,002,092
Indirect Effect	3	\$145,616	\$451,957
Induced Effect	249	\$10,160,704	\$31,525,141
<b>Total Effect</b>	<b>348</b>	<b>\$17,545,391</b>	<b>\$40,979,190</b>

**Table A - 57: Annual Economic Impact of SB 1090 ESMF and DCPD Employee Retention, Santa Barbara County, (2016 Dollars Annually for 7 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	1	\$27,018	\$77,198
Induced Effect	29	\$1,484,205	\$4,259,754
<b>Total Effect</b>	<b>30</b>	<b>\$1,511,223</b>	<b>\$4,336,953</b>

**Table A - 58: Annual Economic Impact of SB 1090 ESMF and DCPD Employee Retention, Rest of California (2016 Dollars Annually for 7 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0.00	\$0	\$0
Indirect Effect	1	\$106,993	\$286,160
Induced Effect	34	\$2,336,880	\$6,263,058
<b>Total Effect</b>	<b>35</b>	<b>\$2,443,872</b>	<b>\$6,549,218</b>

9.1.2 Impact Decomposition for SB 1090 EDF

**Table A - 59: Annual Economic Impact of SB 1090 EDF, San Luis Obispo County, (2016 Dollars for 1 year)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	53	\$3,192,810	\$8,383,264
Indirect Effect	15	\$704,712	\$2,167,208
Induced Effect	18	\$734,990	\$2,282,487
<b>Total Effect</b>	<b>86</b>	<b>\$4,632,512</b>	<b>\$12,832,959</b>

**Table A - 60: Annual Economic Impact of SB 1090 EDF, Santa Barbara County, (2016 Dollars Annually for 1 Year)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	1	\$100,046	\$281,726
Induced Effect	1	\$46,520	\$135,929
<b>Total Effect</b>	<b>2</b>	<b>\$146,56</b>	<b>\$417,656</b>

**Table A - 61: Annual Economic Impact of SB 1090 EDF, Rest of California (2016 Dollars Annually for 1 Year)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	8	\$557,264	\$1,735,238
Induced Effect	5	\$323,491	\$905,863
<b>Total Effect</b>	<b>13</b>	<b>\$880,756</b>	<b>\$2,641,101</b>

9.1.3 Impact Decomposition for DCPD Closure

**Table A - 62: Annual Economic Impact of DCPD Closure, San Luis Obispo County, (2016 Dollars Annually)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
<b>Direct Effect</b>	-1,397	-\$226,176,965	-\$600,868,412
<b>Indirect Effect</b>	-453	-\$20,126,701	-\$66,081,131
<b>Induced Effect</b>	-1,059	-\$43,143,292	-\$133,868,350
<b>Total Effect</b>	-2,909	-\$289,446,957	-\$800,817,893

**Table A - 63: Annual Economic Impact of DCPD Closure, Santa Barbara County, (2016 Dollars Annually)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
<b>Direct Effect</b>	0	\$0	\$0
<b>Indirect Effect</b>	-13	-\$984,650	-\$2,582,362
<b>Induced Effect</b>	-134	-\$6,768,208	-\$19,399,083
<b>Total Effect</b>	-147	-\$7,752,858	-\$21,981,445

**Table A - 64: Annual Economic Impact of DCPD Closure, Rest of California (2016 Dollars Annually)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
<b>Direct Effect</b>	0	\$0	\$0
<b>Indirect Effect</b>	-46	-\$3,470,403	-\$9,044,158
<b>Induced Effect</b>	-162	-\$10,887,372	-\$29,411,008
<b>Total Effect</b>	-208	-\$14,357,775	-\$38,455,166

9.1.4 Impact Decomposition for DCPD Decommissioning . Low Budget Scenario

**Table A - 65: Annual Economic Impact of Requested DCPD Decommissioning Expenditures, San Luis Obispo County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	3,042	\$169,366,348	\$479,428,135
Indirect Effect	913	\$41,693,740	\$120,208,073
Induced Effect	983	\$40,004,932	\$124,191,337
<b>Total Effect</b>	<b>4,938</b>	<b>\$251,065,018</b>	<b>\$723,827,545</b>

**Table A- 66: Annual Economic Impact of Requested DCPD Decommissioning Expenditures, Santa Barbara County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	96	\$6,012,610	\$16,556,170
Induced Effect	51	\$2,649,689	\$7,728,746
<b>Total Effect</b>	<b>147</b>	<b>\$8,662,298</b>	<b>\$24,284,916</b>

**Table A - 67: Annual Economic Impact of Requested DCPD Decommissioning Expenditures, Rest of California (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	404	\$29,747,878	\$82,831,010
Induced Effect	286	\$17,459,502	\$48,868,417
<b>Total Effect</b>	<b>690</b>	<b>\$47,207,380</b>	<b>\$131,699,428</b>

**Table A - 68: Total Economic Impact of Approved DCP Decommissioning Expenditures, San Luis Obispo County (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$279,666,412	\$70,121,376	\$72,444,947	\$422,232,735
1	Waste management and remediation services	\$85,894,608	\$7,754,986	\$268,300	\$93,917,893
2	Construction of other new nonresidential structures	\$55,982,893	\$0	\$0	\$55,982,893
3	Electric power generation - Nuclear	\$54,997,340	\$11	\$9	\$54,997,359
4	Architectural, engineering, and related services	\$38,593,554	\$5,426,593	\$379,240	\$44,399,387
5	Investigation and security services	\$23,411,028	\$148,458	\$57,739	\$23,617,225
6	Real estate	\$906,675	\$6,375,528	\$6,256,216	\$13,538,418
7	Owner-occupied dwellings	\$0	\$0	\$12,272,361	\$12,272,361
8	Wholesale trade	\$2,814,113	\$4,371,878	\$2,726,302	\$9,912,294
9	Natural gas distribution	\$4,057,131	\$160,115	\$176,064	\$4,393,310
10	Petroleum refineries	\$0	\$3,610,986	\$681,253	\$4,292,239
	Total all other categories	\$13,009,070	\$42,272,822	\$49,627,464	\$104,909,356

**Table A - 69: Total FTE Jobs from Approved DCP Decommissioning Expenditures, San Luis Obispo County (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	1,774.48	532.51	573.41	2,880.40
1	Investigation and security services	584.49	3.70	1.44	589.63
2	Waste management and remediation services	382.03	34.49	1.19	417.71
3	Construction of other new nonresidential structures	405.03	0.00	0.00	405.03
4	Architectural, engineering, and related services	269.63	37.91	2.65	310.19
5	Real estate	5.75	40.41	39.66	85.81
6	Full-service restaurants	0.00	32.48	35.55	68.03
7	Wholesale trade	13.97	21.69	13.52	49.18
8	Electric power generation - Nuclear	45.83	0.00	0.00	45.83
9	Limited-service restaurants	0.00	8.92	31.65	40.57
10	Environmental and other technical consulting services	24.36	12.83	1.34	38.53
	Total all other categories	43.41	340.08	446.41	829.91

**Table A - 70: State and Local Tax Impact of Approved DCPD Decommissioning Expenditures, San Luis Obispo County (2016 Dollars Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$36,537
Social Ins Tax- Employee Contribution	\$223,279	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$467,706	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$9,934,742	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$8,819,881	\$0	\$0
TOPI: Motor Vehicle Lic	\$0	\$0	\$192,644	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$9,090	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$896,908	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$117,969	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$651,554
Income Tax	\$0	\$0	\$0	\$4,370,027	\$0
Personal Tax: NonTaxes (Fines- Fees	\$0	\$0	\$0	\$608,326	\$0
Vehicle License	\$0	\$0	\$0	\$150,784	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$67,290	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$29,622	\$0
Total State and Local Tax	\$690,985	\$0	\$19,971,234	\$5,226,048	\$688,092

**Table A - 71: Total Economic Impact of Approved DCPD Decommissioning Expenditures, Santa Barbara County (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$9,657,766	\$4,508,435	\$14,166,201
1	Wholesale trade	\$0	\$1,569,433	\$289,367	\$1,858,800
2	Real estate	\$0	\$976,530	\$659,117	\$1,635,647
3	Other local government enterprises	\$0	\$1,209,571	\$203,824	\$1,413,396
4	Scenic and sightseeing transportation and support activities for transportation	\$0	\$521,717	\$52,282	\$573,999
5	Office administrative services	\$0	\$382,208	\$59,213	\$441,421
6	Lessors of nonfinancial intangible assets	\$0	\$376,392	\$62,735	\$439,126
7	Extraction of natural gas and crude petroleum	\$0	\$339,724	\$49,948	\$389,671
8	Owner-occupied dwellings	\$0	\$0	\$373,285	\$373,285
9	Marketing research and all other miscellaneous professional, scientific, and technical services	\$0	\$257,986	\$27,332	\$285,318
10	Cable and other subscription programming	\$0	\$152,540	\$120,619	\$273,158
	Total all other categories	\$0	\$3,871,665	\$2,610,717	\$6,482,381

**Table A - 72: Total Jobs from Approved DCPD Decommissioning Expenditures, Santa Barbara County (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	55.72	29.87	85.60
1	Real estate	0.00	4.63	3.13	7.76
2	Wholesale trade	0.00	6.46	1.19	7.65
3	Office administrative services	0.00	4.41	0.69	5.10
4	Marketing research and all other miscellaneous professional, scientific, and technical services	0.00	4.03	0.43	4.45
5	Other local government enterprises	0.00	3.57	0.60	4.17
6	Scenic and sightseeing transportation and support activities for transportation	0.00	3.24	0.32	3.56
7	Employment services	0.00	2.60	0.62	3.23
8	Accounting, tax preparation, bookkeeping, and payroll services	0.00	2.23	0.57	2.80
9	Services to buildings	0.00	1.20	0.95	2.15
10	Full-service restaurants	0.00	0.57	1.10	1.68
	Total all other categories	0.00	22.77	20.27	43.05

**Table A - 73: State and Local Tax Impact of Approved DCPD Decommissioning Expenditures, Santa Barbara County (2016 Dollars Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$1,422
Social Ins Tax- Employee Contribution	\$7,391	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$15,482	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$264,667	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$255,366	\$0	\$0
TOPI: Motor Vehicle Lic	\$0	\$0	\$6,221	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$295	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$35,649	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$3,571	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$24,545
Income Tax	\$0	\$0	\$0	\$156,781	\$0
Personal Tax: NonTaxes (Fines- Fees	\$0	\$0	\$0	\$21,961	\$0
Vehicle License	\$0	\$0	\$0	\$5,389	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$2,148	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$1,066	\$0
Total State and Local Tax	\$22,873	\$0	\$565,767	\$187,347	\$25,967



**Table A - 74: Total Economic Impact of Approved DCPD Decommissioning Expenditures, Rest of California (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$48,318,089	\$28,506,577	\$76,824,666
<b>1</b>	Employment services	\$0	\$4,427,495	\$902,224	\$5,329,720
<b>2</b>	Management of companies and enterprises	\$0	\$3,278,245	\$1,138,641	\$4,416,885
<b>3</b>	Wholesale trade	\$0	\$2,374,825	\$1,209,021	\$3,583,845
<b>4</b>	Real estate	\$0	\$943,108	\$1,493,176	\$2,436,284
<b>5</b>	Petroleum refineries	\$0	\$1,746,434	\$319,266	\$2,065,700
<b>6</b>	Owner-occupied dwellings	\$0	\$0	\$2,044,588	\$2,044,588
<b>7</b>	Wireless telecommunications carriers (except satellite)	\$0	\$1,360,340	\$646,609	\$2,006,949
<b>8</b>	Other basic inorganic chemical manufacturing	\$0	\$1,942,163	\$7,857	\$1,950,020
<b>9</b>	Legal services	\$0	\$1,243,267	\$562,456	\$1,805,722
<b>10</b>	Internet publishing and broadcasting and web search portals	\$0	\$1,237,404	\$477,485	\$1,714,889
	Total all other categories	\$0	\$29,764,809	\$19,705,254	\$49,470,063

**Table A - 75: Total FTE Jobs from Approved DCPD Decommissioning Expenditures, Rest of California (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	235.74	166.96	402.70
<b>1</b>	Employment services	0.00	53.62	10.93	64.55
<b>2</b>	Management of companies and enterprises	0.00	12.33	4.28	16.60
<b>3</b>	Wholesale trade	0.00	9.56	4.87	14.42
<b>4</b>	Investigation and security services	0.00	7.58	2.50	10.08
<b>5</b>	Warehousing and storage	0.00	5.53	3.55	9.07
<b>6</b>	Real estate	0.00	3.45	5.46	8.90
<b>7</b>	Other financial investment activities	0.00	2.51	6.04	8.54
<b>8</b>	Legal services	0.00	5.87	2.65	8.53
<b>9</b>	Full-service restaurants	0.00	2.07	6.27	8.34
<b>10</b>	Truck transportation	0.00	5.40	2.02	7.43
	Total all other categories	0.00	127.83	118.41	246.23

**Table A - 76: State and Local Tax Impact of Approved DCPD Decommissioning Expenditures, Rest of California (Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$8,938
Social Ins Tax- Employee Contribution	\$46,149	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$96,668	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$1,103,327	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$906,878	\$0	\$0
TOPI: Motor Vehicle Lic	\$0	\$0	\$25,038	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$1,190	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$164,246	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$31,218	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$160,840
Personal Tax: Income Tax	\$0	\$0	\$0	\$884,933	\$0
Personal Tax: NonTaxes (Fines- Fees	\$0	\$0	\$0	\$145,924	\$0
Personal Tax: Motor Vehicle License	\$0	\$0	\$0	\$30,324	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$10,654	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$6,008	\$0
Total State and Local Tax	\$142,817	\$0	\$2,231,898	\$1,077,843	\$169,779

**Table A - 77: Total Economic Impact of Upper Bound DCPD Decommissioning Expenditures, San Luis Obispo County (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$599,285,169	\$150,260,091	\$155,239,172	\$904,784,432
1	Waste management and remediation services	\$184,059,875	\$16,617,827	\$574,928	\$201,252,629
2	Construction of other new nonresidential structures	\$119,963,342	\$0	\$0	\$119,963,342
3	Electric power generation - Nuclear	\$117,851,442	\$23	\$20	\$117,851,484
4	Architectural, engineering, and related services	\$82,700,474	\$11,628,413	\$812,657	\$95,141,543
5	Investigation and security services	\$50,166,489	\$318,125	\$123,726	\$50,608,340
6	Real estate	\$1,942,875	\$13,661,846	\$13,406,177	\$29,010,896
7	Owner-occupied dwellings	\$0	\$0	\$26,297,916	\$26,297,916
8	Wholesale trade	\$6,030,243	\$9,368,310	\$5,842,076	\$21,240,630
9	Natural gas distribution	\$8,693,853	\$343,103	\$377,280	\$9,414,236
10	Petroleum refineries	\$0	\$7,737,828	\$1,459,827	\$9,197,655
	Total all other categories	\$27,876,578	\$90,584,618	\$106,344,566	\$224,805,762

**Table A - 78: Total FTE Jobs from Upper Bound DCPD Decommissioning Expenditures, San Luis Obispo County (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	3,802.46	1,141.10	1,228.73	6,172.29
1	Investigation and security services	1,252.47	7.94	3.09	1,263.50
2	Waste management and remediation services	818.64	73.91	2.55	895.10
3	Construction of other new nonresidential structures	867.93	0.00	0.00	867.93
4	Architectural, engineering, and related services	577.77	81.24	5.67	664.70
5	Real estate	12.32	86.60	84.98	183.87
6	Full-service restaurants	0.00	69.60	76.17	145.77
7	Wholesale trade	29.93	46.49	28.98	105.38
8	Electric power generation - Nuclear	98.21	0.00	0.00	98.21
9	Limited-service restaurants	0.00	19.11	67.82	86.93
10	Environmental and other technical consulting services	52.20	27.50	2.88	82.56
	Total all other categories	93.03	728.75	956.60	1,778.37

**Table A - 79: State and Local Tax Impact of Upper Bound DCPD Decommissioning Expenditures, San Luis Obispo County (2016 Dollars Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$78,294
Social Ins Tax- Employee Contribution	\$478,455	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$1,002,227	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$21,288,734	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$18,899,745	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$412,809	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$19,478	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$1,921,946	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$252,791	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$1,396,187
Personal Income Tax	\$0	\$0	\$0	\$9,364,343	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	\$1,303,556	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$323,109	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$144,194	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$63,476	\$0
Total State and Local Tax	\$1,480,682	\$0	\$42,795,501	\$11,198,675	\$1,474,482

**Table A - 80: Total Economic Impact of Upper Bound DCPD Decommissioning Expenditures, Santa Barbara County (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$20,695,212	\$9,660,933	\$30,356,145
1	Wholesale trade	\$0	\$3,363,071	\$620,072	\$3,983,142
2	Real estate	\$0	\$2,092,565	\$1,412,393	\$3,504,957
3	Other local government enterprises	\$0	\$2,591,939	\$436,766	\$3,028,706
4	Scenic and sightseeing transportation and support activities for transportation	\$0	\$1,117,965	\$112,032	\$1,229,997
5	Office administrative services	\$0	\$819,017	\$126,885	\$945,902
6	Lessors of nonfinancial intangible assets	\$0	\$806,555	\$134,432	\$940,985
7	Extraction of natural gas and crude petroleum	\$0	\$727,980	\$107,031	\$835,010
8	Owner-occupied dwellings	\$0	\$0	\$799,896	\$799,896
9	Marketing research and all other miscellaneous professional, scientific, and technical services	\$0	\$552,828	\$58,568	\$611,396
10	Cable and other subscription programming	\$0	\$326,871	\$258,470	\$585,339
	Total all other categories	\$0	\$8,296,425	\$5,594,393	\$13,890,816

**Table A - 81: Total Jobs from Upper Bound DCPD Decommissioning Expenditures, Santa Barbara County (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	119.40	64.01	183.42
1	Real estate	0.00	9.93	6.71	16.64
2	Wholesale trade	0.00	13.85	2.55	16.40
3	Office administrative services	0.00	9.45	1.47	10.92
4	Marketing research and all other miscellaneous professional, scientific, and technical services	0.00	8.63	0.92	9.54
5	Other local government enterprises	0.00	7.65	1.29	8.93
6	Scenic and sightseeing transportation and support activities for transportation	0.00	6.95	0.69	7.64
7	Employment services	0.00	5.57	1.34	6.92
8	Accounting, tax preparation, bookkeeping, and payroll services	0.00	4.77	1.22	6.00
9	Services to buildings	0.00	2.58	2.03	4.61
10	Full-service restaurants	0.00	1.23	2.36	3.60
	Total all other categories	0.00	48.80	43.44	92.25

**Table A - 82: State and Local Tax Impact of Upper Bound DCPD Decommissioning Expenditures, Santa Barbara County (2016 Dollars Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$3,048
Social Ins Tax- Employee Contribution	\$15,837	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$33,176	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$567,143	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$547,212	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$13,331	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$632	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$76,391	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$7,652	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$52,596
Personal Income Tax	\$0	\$0	\$0	\$335,960	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	\$47,060	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$11,549	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$4,604	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$2,285	\$0
Total State and Local Tax	\$49,013	\$0	\$1,212,357	\$401,457	\$55,644

**Table A - 83: Total Economic Impact of Upper Bound DCPD Decommissioning Expenditures, Rest of California (2016 Dollars Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	\$0	\$103,538,763	\$61,085,522	\$164,624,285
1	Employment services	\$0	\$9,487,490	\$1,933,338	\$11,420,828
2	Management of companies and enterprises	\$0	\$7,024,811	\$2,439,945	\$9,464,754
3	Wholesale trade	\$0	\$5,088,911	\$2,590,760	\$7,679,669
4	Real estate	\$0	\$2,020,946	\$3,199,664	\$5,220,609
5	Petroleum refineries	\$0	\$3,742,359	\$684,141	\$4,426,500
6	Owner-occupied dwellings	\$0	\$0	\$4,381,260	\$4,381,260
7	Wireless telecommunications carriers (except satellite)	\$0	\$2,915,015	\$1,385,591	\$4,300,605
8	Other basic inorganic chemical manufacturing	\$0	\$4,161,779	\$16,836	\$4,178,615
9	Legal services	\$0	\$2,664,143	\$1,205,262	\$3,869,405
10	Internet publishing and broadcasting and web search portals	\$0	\$2,651,580	\$1,023,183	\$3,674,763
	Total all other categories	\$0	\$63,781,734	\$42,225,545	\$106,007,277

**Table A - 84: Total FTE Jobs from Upper Bound DCPD Decommissioning Expenditures, Rest of California (Annually for 10 years)**

Rank	Description	Direct	Indirect	Induced	Total
	<b>Total</b>	0.00	505.16	357.78	862.94
1	Employment services	0.00	114.90	23.42	138.32
2	Management of companies and enterprises	0.00	26.42	9.18	35.58
3	Wholesale trade	0.00	20.48	10.43	30.90
4	Investigation and security services	0.00	16.25	5.36	21.60
5	Warehousing and storage	0.00	11.85	7.61	19.44
6	Real estate	0.00	7.40	11.70	19.08
7	Other financial investment activities	0.00	5.37	12.95	18.30
8	Legal services	0.00	12.57	5.69	18.27
9	Full-service restaurants	0.00	4.44	13.43	17.88
10	Truck transportation	0.00	11.58	4.34	15.92
	Total all other categories	0.00	273.93	253.73	527.64

**Table A - 85: State and Local Tax Impact of Upper Bound DCPD Decommissioning Expenditures, Rest of California (Annually for 10 years)**

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
Dividends	\$0	\$0	\$0	\$0	\$19,154
Social Ins Tax- Employee Contribution	\$98,891	\$0	\$0	\$0	\$0
Social Ins Tax- Employer Contribution	\$207,146	\$0	\$0	\$0	\$0
TOPI: Sales Tax	\$0	\$0	\$2,364,273	\$0	\$0
TOPI: Property Tax	\$0	\$0	\$1,943,310	\$0	\$0
TOPI: Vehicle License	\$0	\$0	\$53,652	\$0	\$0
TOPI: Severance Tax	\$0	\$0	\$2,550	\$0	\$0
TOPI: Other Taxes	\$0	\$0	\$351,956	\$0	\$0
TOPI: S/L NonTaxes	\$0	\$0	\$66,896	\$0	\$0
Corporate Profits Tax	\$0	\$0	\$0	\$0	\$344,658
Personal Income Tax	\$0	\$0	\$0	\$1,896,285	\$0
Personal Tax: NonTaxes (Fines- Fees)	\$0	\$0	\$0	\$312,695	\$0
Personal Tax: Vehicle License	\$0	\$0	\$0	\$64,980	\$0
Personal Tax: Property Taxes	\$0	\$0	\$0	\$22,830	\$0
Personal Tax: Other Tax (Fish/Hunt)	\$0	\$0	\$0	\$12,875	\$0
Total State and Local Tax	\$306,036	\$0	\$4,782,638	\$2,309,664	\$363,812



## 9.2 Specific Impact Estimates from Alternative Decommissioning Finance Scenarios

This sub-section presents impact decomposition results for three different decommissioning budget scenarios: Approved (\$2.7 billion), Requested (\$4.8 billion), and a hypothetical Upper Bound (\$6 billion) scenario. Here we look specifically at the decommissioning impact, not considering SB 1090 or closure.

### 9.2.1 Policy Impacts of Decommissioning Expenditures: Three Alternatives

**Table A - 86: Annual Economic Impact of Approved DCPD Decommissioning Expenditures, San Luis Obispo County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	1711	\$95,268,571	\$269,678,326
Indirect Effect	513	\$23,452,729	\$67,617,041
Induced Effect	553	\$22,502,774	\$69,857,627
<b>Total Effect</b>	<b>2778</b>	<b>\$141,224,072</b>	<b>\$407,152,994</b>

**Table A - 87: Annual Economic Impact of Approved DCPD Decommissioning Expenditures, Santa Barbara County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	54	\$3,382,093	\$9,312,845
Induced Effect	29	\$1,490,450	\$4,347,420
<b>Total Effect</b>	<b>83</b>	<b>\$4,872,543</b>	<b>\$13,660,265</b>

**Table A - 88: Annual Economic Impact of Approved DCPD Decommissioning Expenditures, Rest of California (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	228	\$16,733,181	\$46,592,443
Induced Effect	161	\$9,820,970	\$27,488,485
<b>Total Effect</b>	<b>389</b>	<b>\$26,554,151</b>	<b>\$74,080,928</b>

**Table A - 89: Annual Economic Impact of Requested DCPD Decommissioning Expenditures, San Luis Obispo County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	3,042	\$169,366,348	\$479,428,135
Indirect Effect	913	\$41,693,740	\$120,208,073
Induced Effect	983	\$40,004,932	\$124,191,337
<b>Total Effect</b>	<b>4,938</b>	<b>\$251,065,018</b>	<b>\$723,827,545</b>

**Table A - 90: Annual Economic Impact of Requested DCPD Decommissioning Expenditures, Santa Barbara County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	96	\$6,012,610	\$16,556,170
Induced Effect	51	\$2,649,689	\$7,728,746
<b>Total Effect</b>	<b>147</b>	<b>\$8,662,298</b>	<b>\$24,284,916</b>

**Table A - 91: Annual Economic Impact of Requested DCPD Decommissioning Expenditures, Rest of California (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	404	\$29,747,878	\$82,831,010
Induced Effect	286	\$17,459,502	\$48,868,417
<b>Total Effect</b>	<b>691</b>	<b>\$47,207,380</b>	<b>\$131,699,428</b>

**Table A - 92: Annual Economic Impact of Upper Bound DCPD Decommissioning Expenditures, San Luis Obispo County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	3,802	\$211,707,935	\$599,285,169
Indirect Effect	1,141	\$52,117,175	\$150,260,091
Induced Effect	1,229	\$50,006,165	\$155,239,172
<b>Total Effect</b>	<b>6,172</b>	<b>\$313,831,272</b>	<b>\$904,784,432</b>

**Table A - 93: Annual Economic Impact of Upper Bound DCPD Decommissioning Expenditures, Santa Barbara County, (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	119	\$7,515,762	\$20,695,212
Induced Effect	64	\$3,312,111	\$9,660,933
<b>Total Effect</b>	<b>183</b>	<b>\$10,827,873</b>	<b>\$30,356,145</b>

**Table A - 94: Annual Economic Impact of Upper Bound DCPD Decommissioning Expenditures, Rest of California (2016 Dollars Annually for 10 Years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	505	\$37,184,847	\$103,538,763
Induced Effect	358	\$21,824,378	\$61,085,522
<b>Total Effect</b>	<b>863</b>	<b>\$59,009,225</b>	<b>\$164,624,285</b>

### 9.3 Net Impacts of DCPD Closure, SB 1090, and Decommissioning Under Three Budget Scenarios

This final set of tables consolidates all components of the impact assessment for each decommissioning budget scenario: Net Impacts of Requested Decommissioning Expenditures

**Table A - 95: Net Annual Economic Impact of DCPD Closure with Requested Decommissioning Expenditures, San Luis Obispo County (2016 Dollars Annually for 10 years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	1,646	-\$56,810,617	-\$121,440,277
Indirect Effect	460	\$21,567,039	\$54,126,942
Induced Effect	-76	-\$3,138,360	-\$9,677,013
<b>Total Effect</b>	<b>2,030</b>	<b>-\$38,381,939</b>	<b>-\$76,990,348</b>

**Table A - 96: Net Annual Economic Impact of DCPD Closure with Requested Decommissioning Expenditures, Santa Barbara County**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	82	\$5,027,960	\$13,973,808
Induced Effect	-83	-\$4,118,519	-\$11,670,337
<b>Total Effect</b>	<b>-1</b>	<b>\$909,440</b>	<b>\$2,303,471</b>

**Table A - 97: Net Annual Economic Impact of DCPD Closure with Requested Decommissioning Expenditures, Rest of California**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	358	\$26,277,475	\$73,786,852
Induced Effect	124	\$6,572,130	\$19,457,409
<b>Total Effect</b>	<b>483</b>	<b>\$32,849,605</b>	<b>\$93,244,262</b>

**Table A - 98: Net Annual Economic Impact of DCPD Closure with Approved Decommissioning Expenditures, San Luis Obispo County, (2016 Dollars Annually for 10 years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	315	-\$130,908,394	\$331,190,086
Indirect Effect	61	\$3,326,028	\$1,535,910
Induced Effect	-506	-\$20,640,518	-\$64,010,723
<b>Total Effect</b>	<b>-130</b>	<b>-\$148,222,885</b>	<b>\$393,664,899</b>

**Table A - 99: Net Annual Economic Impact of DCPD Closure with Approved Decommissioning Expenditures, Santa Barbara County, (2016 Dollars Annually for 10 years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0.00	\$0	\$0
Indirect Effect	41	\$2,397,443	\$6,730,483
Induced Effect	-105	-\$5,277,758	-\$15,051,663
<b>Total Effect</b>	<b>-66</b>	<b>-\$2,880,315</b>	<b>-\$8,321,180</b>

**Table A - 100: Net Annual Economic Impact of DCPD Closure with Approved Decommissioning Expenditures, Rest of California, (2016 Dollars Annually for 10 years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0.00	\$0	\$0
Indirect Effect	181	\$13,262,778	\$37,548,285
Induced Effect	-1	-\$1,066,402	-\$1,922,523
<b>Total Effect</b>	<b>180</b>	<b>\$12,196,376</b>	<b>\$35,625,762</b>

9.3.1 Net Impacts of Upper Bound Decommissioning Expenditures

**Table A - 101: Net Annual Economic Impact of DCPD Closure with Upper Bound Decommissioning Expenditures, San Luis Obispo County, (2016 Dollars Annually for 10 years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	2,406	-\$14,469,030	-\$1,583,243
Indirect Effect	688	\$31,990,474	\$84,178,960
Induced Effect	170	\$6,862,873	\$21,370,822
<b>Total Effect</b>	<b>3,265</b>	<b>\$24,384,315</b>	<b>\$103,966,539</b>

**Table A - 102: Net Annual Economic Impact of DCPD Closure with Upper Bound Decommissioning Expenditures, Santa Barbara County, (2016 Dollars Annually for 10 years)**

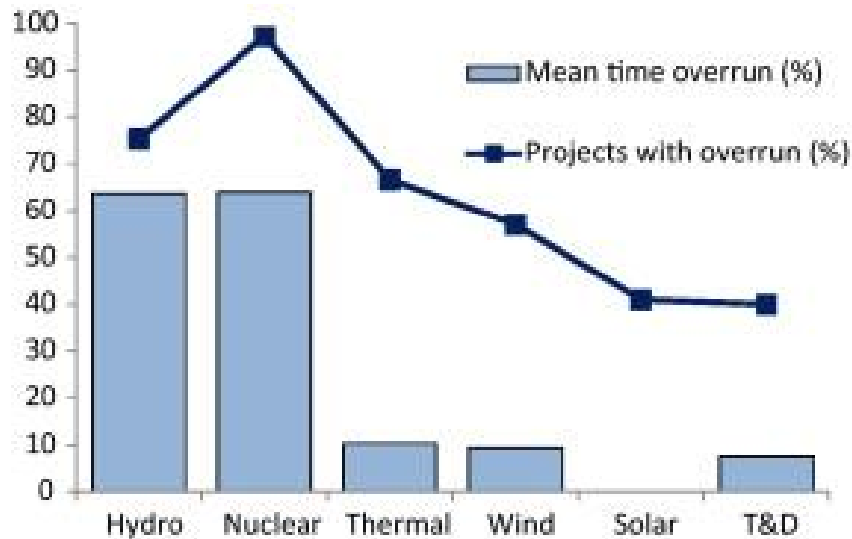
Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	106	\$6,531,112	\$18,112,850
Induced Effect	-70	-\$3,456,097	-\$9,738,150
<b>Total Effect</b>	<b>36</b>	<b>\$3,075,015</b>	<b>\$8,374,700</b>

**Table A - 103: Net Annual Economic Impact of DCPD Closure with Upper Bound Decommissioning Expenditures, Rest of California, (2016 Dollars Annually for 10 years)**

Impact Type	Employment (FTE Jobs)	Labor Income	Output
Direct Effect	0	\$0	\$0
Indirect Effect	459	\$33,714,444	\$94,494,605
Induced Effect	196	\$10,937,006	\$31,674,514
<b>Total Effect</b>	<b>655</b>	<b>\$44,651,450</b>	<b>\$126,169,119</b>

It can be noted that the Upper Bound case results in net stimulus for the overall SLO economy. This scenario would be analogous to a 25% cost overrun on the decommissioning project. Research on this issue suggests that overruns are endemic to electric power infrastructure development and management. In a survey of 180 nuclear reactor construction projects, for example, finds that 100% were over budget by an average of 117% (Figure 31 and Table A - 104). Of course, decommissioning differs in many ways from construction, but perhaps less so by these metrics.

**Figure 31: Mean Time Overruns and Percentage of Projects with a Cost Overrun for Electricity Infrastructure by Energy Source**



Source: Sovacool et al (2014).

**Table A - 104: Mean Cost Escalation for Various Infrastructure Projects**

Technology	Mean Cost Escalation (%)	(n) for the Sample
Nuclear reactors	117	180
Hydroelectric dams	71	61
Railway networks	45	58
Bridges and tunnels	34	33
Roads	20	167
Mining projects	14	63
Thermal power plants	13	36
Wind farms	8	35
Transmission projects	8	50
Solar farms	1	39

Source: Data for electricity infrastructure comes from this study. Data for other items come from (Flyvbjerg et al., 2002, 2004).

## 10 Appendix 3 – Public Comments on the Report

As a matter of policy, the CPUC allows for and acknowledges public comments on sponsored assessments like the present one. From June 26, 2019, the time of public distribution and presentation of the final draft report, public comment was invited for a period of 30 days. All submissions were reviewed for authenticity and comment in this final version of this report. Only comments addressing the economic impacts of DCCP closure have been reproduced here; comments related to the decision to close the plant are not pertinent to this report and have not been included.

A total of seven contributors are represented:

1. Charlene Rosales . representing the Coalition of Cities - July 25, 2019
2. Gene Nelson . representing Californians for Green Nuclear Power
3. Heather Matteson . a private individual - July 24, 2019
4. Rochelle Becker . representing the Alliance for Nuclear Responsibility (A4NR) - July 23, 2019
5. Alex Karlin . a private individual - July 23, 2019
6. Guy Savage . representing County of San Luis Obispo - July 23, 2019
7. Nancy O'Malley . a private individual - July 23, 2019

Submissions are listed above and below by the name of the individual who submitted the comments, even when there may have been multiple authors. Order is reverse chronological by date and time of submission, with more recent submissions preceding later ones. It should be emphasized that inclusion of these comments only constitutes recognition of the important role of public input in the state's energy policy dialog. Inclusion does not indicate agreement by the authors of this report or the CPUC with the views expressed by any individual contributor or group they represent, nor do these statements represent or imply any recommendations of the report's authors or policies of the CPUC.



## 10.1 Charlene Rosales

On behalf of the Coalition of Cities (Arroyo Grande, Atascadero, Morro Bay, Paso Robles, Pismo Beach and San Luis Obispo), please find attached our comments regarding the Economic Impact Assessment on Prospective Closure of the Diablo Canyon Nuclear Power Plant.

The Coalition of Cities (Arroyo Grande, Atascadero, Morro Bay, Paso Robles, Pismo Beach and San Luis Obispo), wishes to express its appreciation for the opportunity to provide input on the Economic Impact Assessment conducted by UC Berkeley, commissioned by the California Public Utilities Commission (CPUC) as a result of Senate Bill 968. The following comments are provided for your consideration as impacts continue to be studied and discussed.

Absent the funds provided by SB1090, we acknowledge that the negative economic impacts would be far greater across our region. These funds are likely to be expended by the various jurisdictions over time which begs some questions regarding the positive effects that are projected both pre-closure and post-closure (the ~~positive-shock~~, in part as a result of the \$85 million for community impact mitigation and the \$4.8 billion allocated over 10 years for decommissioning expenditures).

The SB1090 funds were treated as supplemental dollars that would be provided in advance of the lost unitary tax, which is anticipated in the report to stay the same pre-closure. The one-time distribution of \$10 million to San Luis Obispo County and the Cities for community impact mitigation (the Economic Development Fund) has a net economic benefit but a realistic assumption that there will be a slide in the unitary tax that would offset some of that benefit.

The Coalition of Cities has concerns that PG&E will not have adequate funds for sequential closure and decommissioning of the plant. Upon review of the report, we suggest that additional scenarios such as a cold shutdown and decommissioning conducted by a subcontractor at a lesser cost should be analyzed to better inform the extent of a positive-shock before the closure of the power plant.

There are many scenarios in which decommissioning will not create as many jobs as provided in the report. An analysis of the geographic distribution of full-time equivalent job losses would also be beneficial, similar to what was done with the analysis on home prices, to gain a better picture of impacts to both San Luis Obispo and Santa Barbara counties post-closure.

The Coalition of Cities greatly appreciates the CPUC's consideration of our comments and your continued efforts to ensure the safety and economic resilience of our region.

## 10.2 Gene Nelson . representing Californians for Green Nuclear Power

### I. Introduction

Californians for Green Nuclear Power, Inc. (CGNP) respectfully submits these comments proceeding in accordance with the relevant of the California Public Utilities Commission (Commission) *Rules of Practice and Procedure*. (Per the 03/07/2019 ACR, A.18-12-008 and A.18-07-013 are consolidated.) CGNP is presenting three points for the consideration by the Commission. CGNP is anticipating being granted Party status in these consolidated Proceedings as CGNP filed a Motion for Party Status with a stamped-in date of July 16, 2019. The first two points are based on verified written testimony<sup>4</sup> filed with the Commission by the Pacific Gas and Electric Company (PG&E) dated December 13, 2018. The third point was developed independently by CGNP in consideration of established California statutes and regulations regarding the adverse social consequences of emission of greenhouse gases (GHGs) by Diablo Canyon Power Plant's (DCPP's) replacement generation if DCPP is voluntarily closed by PG&E in 2025. These points should also be considered when the CPUC's recent SB 968 study is revised. They will also be supplied to the Commission's SB 968 Project Manager, Attorney David Zizmor. (CGNP requests to make brief comments supported by projection of their slides at the CPUC public engagement meeting regarding DCPP decommissioning plans set for Thursday, August 8, 2019 in San Luis Obispo, California.)

### II. Based on PG&E's detailed (and partially-redacted) Project Cost spreadsheet numbered 6-1, the labor component is only 43.579% of the \$4.802 Billion projected DCPP Decommissioning cost.

#### Here are the steps:

A. Transfer the summary entries for each of the 20 categories of the six-page Table 6-1 regarding Decommissioning Milestones appearing in Volume 3 of PG&E's verified December 13, 2018 written testimony to a new spreadsheet. These entries are highlighted in light blue in PG&E's spreadsheet. They are transferred to a new one-page spreadsheet, which is attached. (Note that entry 13 is skipped.)

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<sup>4</sup> A1812008 Pleadings by the Pacific Gas & Electric Company dated December 13, 2018 . Verification page at page 20 of 32.

B. for categories 3, 6, and 7, calculate the totals for the redactions by subtracting the sum of the visible entries on each of those lines from the total shown in the rightmost column. Place this value in the new column called "Redactions." The largest value for redactions is PG&E's category 3. Redactions total over \$700 million for this category. PG&E's rationale for these redactions are found in the previously referenced Pleadings section.

C. Calculate the percentage of \$4.802 billion projected DCPD decommissioning cost for each of the 7 categories.

D. Prepare a pie chart that highlights the 21.908% fraction found in the new "Redactions" category calculated by CGNP

**5. Compare the modest value of 43.579% for labor with the 100% value assigned to labor in the UC Berkeley study that was recently unveiled by the CPUC.**

This is one of the two lines of evidence that CGNP is using to challenge the conclusions of the recently unveiled and widely promoted "SB 968 Study," created over a two-year interval and managed by the Commission.

**III. PG&E's Modest Projected Decommissioning Staffing Levels are about 13% of the CPUC's SB 968 'Study' Values for at least the first seven years**

The attached personnel versus time chart which essentially matches the chart shown on page 129 of 525 of PG&E's Volume 3 of written testimony filed on December 13, 2018 shows on the last day there are operating staff, December 1, 2025, there are 500 people working on decommissioning on the day that PG&E wants DCPD to close. **The CPUC's SB 968 "study" falsely claims there will be 3,903 people employed in decommissioning tasks on that date - and that high employment level is projected to continue to 2035.** . Thus, the "positive economic shock" alleged in the SB 968 "study" is transformed into a severe and long-lasting

negative economic shock, as the decommissioning workforce is  $500/3,903 = 12.8$  percent of the size that the SB 968 "study" projects.

For those that attended the CPUC public meeting in San Luis Obispo, California connected with the release of the SB 968 "study," even Mr. Tom Jones, the PG&E DCPD Decommissioning Project Manager clarified that the bulk of DCPD's systems must remain intact until all of the spent nuclear fuel (SNF) is transferred from the spent fuel pools to dry cask storage. Under a best-case scenario, this will take 7 years. This time is already greater than 7 years for the similarly sized San Onofre Nuclear

Generating Station (SONGS) - and CGNP believes they don't have all their spent fuel moved to dry casks as of now.

In the case of PG&E's first coastal nuclear power plant, Humboldt Bay Power Plant Unit 3, (HBPPU3) decommissioning did not begin in earnest for 34 years - not the 7+ years for SONGS.

To repeat, decommissioning cannot begin in earnest until all of the spent fuel is transferred to dry cask storage. That means only about 500 decommissioning workers for the first 7 years.

Thus, a more realistic scenario is a localized economic depression on the Central Coast that begins in about 2024 with the loss of the majority of Diablo Canyon Power Plant's positions by December 2025. That means the loss of about a billion dollars annually in direct and indirect payrolls. Diablo Canyon is the largest private-sector employer on the California Central Coast region, with currently about 1,500 good, head-of-household jobs that will be extremely difficult for the region to replace.

#### **IV. Social Cost of Carbon from Closing Diablo Canyon Power Plant in 2024-25**

An omission in Berkeley's Economic Impact Assessment is the Social Cost of Carbon (SC-CO<sub>2</sub>) for replacing Diablo Canyon with any electricity source, or combination thereof, which emits CO<sub>2</sub>, SO<sub>2</sub>, or NO<sub>x</sub> pollution. The SC-CO<sub>2</sub> is meant to be a comprehensive estimate of climate change damages and includes changes in net agricultural productivity, human health, property damages from increased flood risk, and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning. For example: in 2017 California generated an average of 4.6 megawatt hours of electricity for each short ton of CO<sub>2</sub>e<sup>5</sup> it emitted.<sup>6</sup> Replacing Diablo Canyon with sources emitting greenhouse gases at California's average rate will thus increase California emissions by a minimum of 3.91 million short tons/year.

The U.S. EPA has calculated a social cost of carbon at \$42/ton of CO<sub>2</sub> in 2024 and \$46 per ton in 2025, increasing to a maximum of \$69/ton by 2050. Diablo Canyon should be re-licensed to operate for a additional 20-year period.<sup>7</sup> The loss of Diablo Canyon Power Plant would increase California carbon emissions by **82.11 million short tons** during these two decades. These increased carbon emissions will cause environmental, health, and other societal damages of **\$4.375 billion** through 2045.

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<sup>5</sup> CO<sub>2</sub>e+, or CO<sub>2</sub> equivalent, is a combined cost representing greenhouse gases CO<sub>2</sub>, SO<sub>2</sub>, and NO<sub>x</sub> in proportion to their cumulative effect on climate.

<sup>6</sup> The Social Cost of Carbon: Estimating the Benefits of Greenhouse Gas Reduction [https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon\\_.html](https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html)

<sup>7</sup> 2017 California State Emissions: <https://www.eia.gov/electricity/state/california/>

## V. Conclusion

Based on the above three negative externalities, PG&E's voluntary plan to close the highly- functioning and reliable DCPD does not serve the public interest, the primary test for any Commission or Federal Energy Regulatory Commission (FERC) ruling. PG&E's voluntary plan is very harmful to the California Central Coast region's economy from about 2024 forward.

Californians for Green Nuclear Power, Inc. and other advocates for safe, clean nuclear power are working hard via several approaches involving enforcement of California's existing laws to keep Diablo Canyon Power Plant operating well past 2025 for its ratepayer, environmental, and public safety benefits. This filing will also be provided to the Federal Monitor overseeing PG&E's criminal probation in **3:14-cr-00175-WHA-1 - USA v. Pacific Gas and Electric Company.**

### 10.3 Heather Matteson

I delivered verbal comments at the meeting in early July, and part of my comments concerned the lack of public involvement and time for written comments. Thank you for allowing this extra time for people to get familiar with the report and write in.

Below I have included critiques of a lot of the details in the assessment, but generally my comments at the meeting were of a more personal nature. I am one of the 1500 employees who work at Diablo Canyon right now, and I will lose my job in five years.

I have a materials engineering degree from Cal Poly, but when I graduated in 2002, there are no local engineering jobs. I worked for nine months making rectal thermometers for cows, then I worked in a winery for harvest season, and I worked at Express clothing downtown making \$7.50 an hour. After two years of this, I finally decided that I needed to get a real job, and resigned myself to trying for a job at Diablo Canyon. I was pretty nervous about working there. I ended up getting a job as an operator, and quickly became known for asking lots of questions.

It took me about six years, but I finally realized that nuclear energy aligns amazingly with my environmental values. I never thought I had to speak out because it was such a sure thing that I would work at Diablo Canyon until I retired. When Kristin Zaitz and I learned that Diablo Canyon would shut down early, we both felt like we had to speak up and protect this amazing resource which is 10% of California's electricity and the largest

source of clean energy in our state. So we started Mothers for Nuclear, a non-profit to build global support for clean energy including nuclear. I knew it had taken me six years to come around to the idea that nuclear was good, and I didn't want other people to take so long because addressing climate change is so urgent. I believe nuclear energy is our best hope at decarbonizing.

I was a reactor operator before my current job, and now I write procedures for operators. My job has included a lot of technical training (20% of my total work time when I was an operator).

I do not know what I'm going to do after 2025. I believe in nuclear energy and would like to keep working in the industry, but that won't be likely on the central coast, where I've called my home for the last 20 years. My husband and daughter are born-and-raised locals, and I will stay here at least until she graduates from high school. Decommissioning is not an option I'm considering. I have a highly paid technical career, and do not want to work in construction dismantling the power plant.

A lot of people don't seem to realize the difference between the current jobs at Diablo Canyon and what will be happening in decommissioning. There is some amount of permitting and project management, but most is just tearing stuff down. That is not a good use of my skills and education, nor most of the other 1500 (1330 according to Tom Jones at the meeting) employees.

I am also concerned about impacts to my daughter's school (Teach Elementary) and to Cal Poly, where my husband works in computer technology. Cal Poly already struggles severely to recruit and retain talent given the lower pay in academia than industry, combined with the high living costs of San Luis Obispo.

There has recently been discussion about stopping off-road access at Oceano Dunes, which apparently would impact an equivalent of 3300 FTE jobs. Now sounding like the Central Coast will retain the tourism money from the off-roaders who travel to visit and drive on the Oceano dunes, but personally, I'd rather have a community of highly-educated professionals including engineers, mechanics, electricians, welders, and operators who put their money back into our community because they live here.

Every economic study on a given topic seems to reach different conclusions on account of the analyst.

It's impossible for an economic model to include every potential data input, so, to decrease uncertainty in the outcomes, the modelers increase the number of things that they ignore. All economic studies are likely to be erroneous then, since no system that depends on ignorance is likely to be a true predictor of very complex outcomes. This

situation is incredibly complex, and the modelling presented in this analysis is largely based on feelings and perceptions of robustness. This sounds exactly like an economic model based on ignorance. The team at Berkeley admits that they did not include data that was published in PG&Es Nuclear Decommissioning Cost Triennial Proceeding (NDCTP), a document that includes detailed assessments of every aspect of the decommissioning process, along with proposed staffing levels.

A basic look at this public document makes it clear that the Berkeley assessment is way off. The report gives information about other communities that have experienced their local nuclear plant shutting down. Most of these communities were not very similar to San Luis Obispo. Either way, the report did not compare data from other decommissioning projects themselves. If they had, they would see that a majority of spending goes towards waste disposal, bringing in experts on decommissioning, and rental of specialized heavy equipment. None of these activities generate any revenue that will stay in San Luis Obispo County. These activities do not equate to full-time equivalent (FTE) jobs.

It is incredibly disturbing to me that this assessment, paid for with tax dollars, is being used to tell the community of San Luis Obispo that ~~%everything is going to be OK%and %it's not as bad as we thought+ and %there might even be some stimulus from this activity!+I don't think any of these are true. And I don't think this assessment offers any concrete indication that would point to any of these conclusions. Yet, our local media has jumped on the story and, shallow as media is these days, the message of %don't worry, everything's fine+is being spread around from outlet to outlet and our community decision-makers are feeling reassured. This is a step in the wrong direction.~~

Below are my technical comments regarding the details of the assessment.

SB-968 Economic Analysis - The highlight is that decommissioning expenditures will cause a ~~%positive shock+of approximately 4,934 FTE jobs annually for ten years (P.44). They assume all \$4.8 billion of the decommissioning trust fund will be spent locally and within ten years. This is not consistent with the 2018 NDCTP filing. See some thoughts below.~~

2018 Decommissioning Cost Estimate- a publicly-available document: <http://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A1812008/1842/250896150.pdf>

Page 112 provides a chart that shows staffing levels in the time leading up to decommissioning, and immediately after shutdown. It shows an overall reduction in jobs starting in October 2024 . between 200 and 400 jobs are lost pre-shutdown. After shutdown, the total staffing dips to around 500 people.

Later in the DCE there are staffing charts for individual functions/departments, but no overall staffing numbers are given. If you add all the individual staffing levels up, the total is well under 1,000 during any given year, and closer to 500.

You can also do some math with the staffing dollar amounts presented in Table 10-3, p.337. There is no way this adds up to 4,934 FTE\$.

Also Table 10-3, p.337 . Notice the LLRW burial and disposal cost. This is all out of state. Almost \$900 Million in today\$ dollars, and 19% of the overall cost estimate . but look at the escalation. By the time we spend the money, it will be 37% of the total project spend. Again, out of state.

Thank you again for your time and for the opportunity to comment, and feel free to contact me at any time with any questions or concerns.

#### 10.4 Rochelle Becker

The Alliance for Nuclear Responsibility (A4NR) is responding to the call for comments regarding the SB 968 report. As the original sponsor of the enabling legislation, we have followed this process closely for three years. We thank Senator Monning for his foresight in authoring this legislation and for his leadership with regard to the retirement of Diablo Canyon.

A4NR has one major comment and request regarding this study. The study as presented does not appear to formally analyze and report the economic consequences (or mitigating strategies) of an earlier-than-planned shutdown of Diablo Canyon prior to 2024/2025. The CPUC Decision on the Joint Proposal to close the plant specifically notes that PG&E will retire the plant by 2024/2025; but nothing compels PG&E to operate up to that date, and nothing prevents the plant from being closed sooner, perhaps as a result of external, natural or economic forces.

It would seem that prudent planning dictates the county deserves some consideration of this alternative outcome in the final study results, and we look forward to seeing that.

Thank you for your efforts to see this project through to completion.



## 10.5 Alex Karlin

The purpose of this letter is to comment on the draft report ~~%~~Prospective Closure of the Diablo Canyon Nuclear Power Plant - Economic Impact Assessment+ (Draft EIA) prepared for the California Public Utilities Commission (CPUC) by David Wells Roland-Holst and his team of economists at Berkeley Economic Advising and Research (BEAR). The Draft EIA is required by SB 968 and was issued to the public on June 28, 2019.

### **I. Introduction**

My comments are based on my 45-year background as an attorney and judge in the environmental and nuclear arena. I am a retired Administrative Judge with the Atomic Safety and Licensing Board Panel (ASLBP) of the U.S. Nuclear Regulatory Commission, having adjudicated cases involving both Diablo Canyon and Yucca Mountain. I formerly served as the Deputy General Counsel of BNFL Inc. a major corporation engaged in the decontamination and decommissioning of radioactive and nuclear facilities, including Oak Ridge, TN; Hanford, WA; and utility owned nuclear power plants. Prior to that I served as an enforcement attorney at the U.S. Environmental Protection Agency. I am currently a member of the PG&E created Diablo Canyon Decommissioning Engagement Panel (DCDEP). (This letter today represents only my own views, not necessarily those of the DCDEP.) I reside in San Luis Obispo, CA, within 12 miles of the Diablo Canyon nuclear reactors.

### **II. SB 968 & the Draft EIA Provide an Excellent Foundation**

First, I would like to thank Senator Bill Monning for his outstanding leadership on these environmental and nuclear issues that are crucial to San Luis Obispo, the Central Coast, and to the entire State of California. SB 968 was conceived by Senator Monning and he successfully shepherded it through the Legislature. He and his staff monitored and encouraged the progress of the Draft EIA. Our community appreciates his hard work and vision.

Second, great thanks are also due to Assembly member Jordan Cunningham, who has fully supported the evolution and implementation of SB 968, including this EIA and such valuable programs as The Hourglass Project. He also has been steadfast in protecting the safety and economic vitality of our community as we confront the enormous impacts of the closure of Diablo Canyon.

Third, I want to express my appreciation to CPUC for managing the SB 968 process by obtaining an independent third party to develop the EIA and for getting this project done

by July 1, 2019. Given the pending closure of the Diablo Canyon nuclear reactors and the enormous safety and economic impacts it will have for our community, this EIA is a timely and important analysis. CPUC is a central player in the decommissioning process.

Fourth, I commend Professor Roland-Holst and the team at BEAR for an excellent and independent analysis of the adverse, beneficial, and net economic impacts that are likely to occur to San Luis Obispo County and the surrounding regions when PG&E closes and decommissions the two nuclear power reactors at Diablo Canyon. Within the time and budget allocated to this study, BEAR produced a very helpful study that can inform Governor Newsom, Senator Monning, Assemblymember Cunningham, and other State and local community leaders as we move forward. Decommissioning Diablo Canyon will cost many billions of dollars and take decades.

Neutral and professional analysis, such as that provided by BEAR in the EIA, provide us with the best foundation to allow State and local governmental decision-makers, and other stakeholders, to proactively manage the impacts of the closure of Diablo wisely and effectively.

### **III. COMMENT: Final EIA Should Urge the State to Establish a Robust, Sustainable, and Independent Closure & Decommissioning Advisory Committee**

My main comment is to urge Professor Roland-Holst and the BEAR team to recommend, in the final EIA, that the State of California create a robust, sustainable, and independent closure and decommissioning advisory committee. The Draft EIA clearly describes the compelling case for such an independent and multi-stakeholder advisory entity.

On page 10 the Draft EIA states that perhaps the most important findings for our assessment relate to . . . clear and significant disparities between public and private sector expectations regarding closure impacts and adds:

[While] Enterprises, NGOs, and Public Agencies generally agree on the most important SLO risks+ [they have] discordant expectations over shared values [which] make a compelling case for determined and expanded commitments to ongoing policy dialog.

BEAR concluded that We can only hope the evidence presented here will support more robust and constructive engagement to mobilize local institutions.+Draft EIA page 10.

BEAR's final bullet, on its final slide, in its June 28, 2019 presentation, emphasizes the point:

We hope the evidence presented here can support more robust and constructive engagement, mobilizing the community for sustainable and inclusive prosperity.

BEAR should now convert this hope into a strong recommendation to the State.

## **A. New York Example: Indian Point Closure Task Force<sup>8</sup>**

Progressive States have already established independent, robust, and sustainable closure and decommissioning advisory entities such as the one suggested in the Draft EIA. The Indian Point Closure Task Force, created by the State of New York, is one such example.<sup>9</sup> Its mission is summarized by the New York Governor, as follows:

On Feb. 28, 2017, Governor Andrew M. Cuomo announced the creation of a task force to provide guidance and support to the communities, taxing jurisdictions, and employees affected by the planned closure of Indian Point. The Task Force was charged with developing recommendations to mitigate local tax and workforce impacts, evaluating and identifying new economic opportunities and work force retraining programs and opportunities, advocating for appropriate decommissioning timelines in the best interests of local communities, and ultimately positioning the region for a prosperous and sustainable future. (Press Release from Governor Cuomo).

## **B. Vermont Example: Vermont Nuclear Decommissioning Advisory Panel<sup>10</sup>**

Likewise, the State of Vermont created an independent advisory board for the decommissioning of the Vermont Yankee Nuclear Power Station. Under Vermont law, the mission of the VYNPS decommissioning advisory board includes:

To advise the Governor, the General Assembly, the agencies of the State, and the public on issues related to the decommissioning of the VYNPS, with a written report being provided annually to the Governor and to the energy committees of the General Assembly. The provisions of 2 V.S.A. § 20(d) (expiration of reports) shall not apply to this report.

To serve as a conduit for public information and education on and to encourage community involvement in matters related to the decommissioning of the VYNPS and to receive written reports and presentations on the decommissioning of the Station at its regular meetings.

To periodically receive reports on the Decommissioning Trust Fund and other funds associated with decommissioning of or site restoration at the VYNPS, including fund balances, expenditures made, and reimbursements received.

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<sup>8</sup> <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=17-00994&submit=Search>

<sup>9</sup> Indian Point Closure Task Force contact person: James.Denn@dps.nu.gov (518 474-7080).

<sup>10</sup> <https://publicservice.vermont.gov/electric/ndcap>

To receive reports regarding the decommissioning plans for the VYNPS, including any site assessments and post-shutdown decommissioning assessment reports; provide a forum for receiving public comment on these plans and reports; and to provide comment on these plans and reports as the Panel may consider appropriate to State agencies and the owner of the VYNPS.<sup>11</sup>

### **C. Massachusetts Example: Pilgrim Nuclear Power Station Nuclear Decommissioning Advisory Panel<sup>12</sup>**

The Commonwealth of Massachusetts has established a similar independent advisory entity to monitor the decommissioning and closure of the Pilgrim Nuclear Power Station.<sup>13</sup> The statutory mission of this advisory panel is as follows:

The Panel shall serve in an advisory capacity only and shall not have authority to direct decommissioning of the PNPS. The duties of the panel shall be: (1) to commence public meetings beginning on or about June 1, 2017, at a frequency of quarterly until the shutdown of the Pilgrim Nuclear Power Station (PNPS) for the purpose of discussing issues related to decommissioning planning activities; (2) to hold a minimum of four public meetings each year for the purpose of discussing issues relating to the progress of decommissioning of the PNPS beginning on or about June 1, 2019, or when the PNPS permanently ceases power operations; provided that the panel may hold additional meetings; (3) to advise the governor, the general court, the agencies of the commonwealth, and the public on issues related to the decommissioning of the PNPS, with a written report being provided annually to the governor and to the energy committees of the General Court; (4) to serve as a conduit for public information and education on and to encourage community involvement in matters related to the decommissioning of the PNPS and to receive written reports and presentations on the decommissioning of the Station at its regular meetings; (5) to periodically receive reports on the Decommissioning Trust Fund and other funds associated with decommissioning of the PNPS, including fund balances, expenditures made, and reimbursements received; (6) to receive reports regarding the decommissioning plans for the PNPS, including any site assessments and post-shutdown decommissioning assessment reports; provide a forum for receiving public comment on these plans and reports; and to provide comment on these plans and reports as the panel may consider appropriate to state agencies and the owner of the PNPS and in the annual report described in clause (3).<sup>14</sup>

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<sup>11</sup> Vermont Statutes . Title 18 Health, Chapter 34 - Nuclear Decommissioning Citizens Advisory Panel, Section 1700.

<sup>12</sup> <https://www.mass.gov/orgs/nuclear-decommissioning-citizens-advisory-panel>

<sup>13</sup> Contact: Kurt Schwartz, Chair, [NDCAP@state.ma.us](mailto:NDCAP@state.ma.us)

<sup>14</sup> Section 14 of Chapter 188 of the Acts of 2016 of the Commonwealth of Massachusetts.

In formulating its final EIA recommendations, I hope that Dr. Roland-Horst and BEAR will review these as excellent models to implement BEAR's compelling case recommendations.

Like New York, Vermont, and Massachusetts, such an advisory entity should be composed of members designated by the Governor, the Senate, the Assembly, the California Energy Commission, the State Lands Commission, the County of San Luis Obispo, relevant cities, the San Luis Coastal Unified School District, and Congressman Salud Carbajal. Since these persons and entities are to be the advisees, they should have the opportunity to designate the individuals who will be their advisors. Also, like New York, Vermont, and Massachusetts, the Diablo Canyon community advisory board could also include relevant NGOs, Labor representatives, Native American representatives, and business enterprises. The community advisory entity should not just be a public relations panel created by and for PG&E. It should be independent and its function should be to pursue the public interest. It should have the composition and resources needed for the task of helping our State and region navigate the numerous safety and economic issues that will arise during the many decades that it will take to close and decommission Diablo Canyon. I urge BEAR to take this approach in its recommendations.

In short, the final EIA should strongly recommend that the State create a determined, expanded, and robust mechanism for the State and local communities to manage, plan, and engage on the safety and economic issues resulting from the closure and decommissioning of Diablo Canyon . i.e., an independent and adequately composed and resourced closure/decommissioning advisory board.

In closing, I commend Professor Roland-Holst and the Berkeley Economic Advising and Research firm for the excellent economic analysis in their Draft Economic Impact Assessment. I look forward to studying the final EIA - especially to reviewing BEAR's recommendations to CPUC, the Governor, the California Legislature, and other appropriate entities.

If you have any questions or need any clarification regarding the matters covered in my letter, please do not hesitate to contact me.

Thank you for considering these comments.

## 10.6 Guy Savage

On behalf of the County of San Luis Obispo, I would like to thank you and the authors of the Senate Bill 968 (SB 968) Economic Impact Assessment (EIA) for providing an opportunity to make comments and ask questions that may be addressed in the final EIA. I would also like to thank David Zizmor for personally coming to San Luis Obispo to host a public forum for our region, and for providing the community an overview of the EIA.

Attached is a list of questions and comments related to the EIA. For brevity, I have not included commentary on simple errors in the EIA (e.g. tables where data in columns do not add up to totals presented). As discussed with the EIA authors at the public forum on June 28, 2019, I believe obtaining a list/copy of the assumptions and inputs made by the UC Berkeley team in the development of the IMPLAN models used in the EIA development would also be of benefit to the community. This would allow us to replicate their findings and test other scenarios, which SB 968 did not call for or were not explored by the UC Berkeley team.

The County appreciates the authors' consideration of our comments and comments, and I am happy to provide clarifications upon request.

1. The report assumes that the CPUC will authorize funding that will allow PG&E to immediately pursue DECON (immediate dismantling). What is the impact if, instead, PG&E pursues Safe Storage (SAFSTOR)?
2. In its testimony before the CPUC, the County questions PG&E's timelines for moving straight to DECON. In particular, the County states that the time allotted for CEQA activities is insufficient. What is the impact to models if there is a 2-3 year gap between the cessation of energy generation and the start of decommissioning?
3. The report assumes that all \$4.8 billion of decommissioning funds would be expended within 10 years. As has been widely published and discussed at the Diablo Canyon Engagement Panel, reuse is a large focus of the community. Did the report take into consideration any of the alternative approaches being proposed by the community? For instance, the breakwater/harbor, which is one of the pieces of existing infrastructure that has been clearly identified to remain, has a decommissioning cost estimated by PG&E at approximately \$300 million (6% of total costs). Similarly, there is just under \$100 million (another 2%) in costs related to the future transportation of spent fuels to a yet-to-be-identified Department of Energy location. Do any exclusions such as this significantly impact the reports overall findings and result in a less-rosy overall picture?

4. The report assumes that most of the salary received from contractors received during decommissioning will be spent locally. Since many of these contractors will be from out of the area, would most of those dollars be sent home to pay for things such as existing mortgages?

5. The report identifies \$800 million in impact to SLO County, but does not appear to quantify the impact to Santa Barbara County as separate and distinct. Similarly, the report identifies the loss of approximately 1,500 high-paying career jobs, that are replaced with over 4,000 lower-paying shorter-term jobs (decommissioning jobs). Given the costs of housing in the region, doesn't the loss of 1,500 high-paying career jobs have a longer-term and bigger negative shock than having 4,000 lower-paying jobs?

6. How hard would it be to separate the suggested positive shock of D.18-01-022's employee retention funds from SB 1090 and its constituent parts? The report appears to include local government SB 1090 funds as a stimulus above and beyond existing unitary tax being received instead of as keeping the existing unitary tax amounts stable until closure then a steep drop off. Can you explain why or how these funds can result in a positive financial gain for the community? The implication is that if the unitary tax dollars simply continued to flow as they would with an operational plant, that the community would see an equivalent positive effect.

7. The report assumes that SB 1090 funds will be expended in the year received. As discussed at the County Board of Supervisors on numerous occasions, this is not true for the County. In speaking with my colleagues from the school districts and other local governmental agencies, they too are unlikely to expend funds immediately. How does this impact your findings?

**Authors' Response:** These questions represent alternative scenarios that were not included in CPUCs terms of reference for this assessment. While they may be of independent interest, they are not included in this report. Moreover, the IMPLAN input data for the study are proprietary, cannot be distributed by CPUC or the authors, and must be obtained directly from their owner (see <https://www.implan.com/>).

8. How were the 239 respondents randomized or chosen to ensure that the local community perceptions are accurately assessed? Do you believe the 239 respondents to be a statistically valid representation of the entire community?

**Authors' Response:** We distributed the questionnaire electronically to a randomized email sample generated for us by Dunn and Bradstreet. If 4,200 emails, our reporting sample comprised all 239 voluntary respondents.



## 10.7 Nancy O'Malley

I have 2 concerns regarding the study, "Prospective Closure of the Diablo Canyon Nuclear Power Plant Economic Impact Assessment. +

1. The study makes the assumption that all \$4.8 billion of decommissioning expenditures will be spent in San Luis Obispo County. I am concerned that this will not be the case.
2. The study also assumes that decommissioning will begin immediately upon plant closure. I am concerned that any delay in the start of decommissioning due to lack of permits or other factors will have serious economic impacts. If the preplanning phase of decommissioning is not adequately funded and executed, there could be significant delays in the start of decommissioning.

Thank you for the opportunity to raise these concerns.