The Brattle Group

The Economic Impact of AB 32 on Localities: A Look at Chula Vista

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EXECUTIVE SUMMARY

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In 2006, California passed into law Assembly Bill 32 (AB 32), the Global Warming Solutions Act, which requires the state to reduce its global warming pollution approximately 12 percent below current levels by 2020. The California Air Resources Board (CARB) is designing a mix of policies to reach this target.

The proposed policies for reaching the 2020 emissions target include:

- Renewable energy standards
- A requirement to lower global warming emissions from transportation fuels
- Stricter efficiency standards for buildings, appliances, and vehicles
- A carbon cap and pricing program that would limit emissions from the state's largest global warming pollution sources

Study Findings

This study examines how the policies used to reach the state's 2020 emissions-reduction target are likely to affect California cities, focusing in depth on the potential impacts of these policies on Chula Vista, a mid-sized city in San Diego County whose characteristics typify many such cities in the state (see the box below). The study reveals that AB 32 is expected to have a minimal impact on Chula Vista and other cities, as most local governments are not very energy-intensive—i.e., energy expenditures are only a small share of a locality's total budget. The study projects that while the state's clean energy policies will cause the price of energy to rise slightly, the energy expenditures represent a relatively small share of the California economy overall, and thus the rise in energy costs will result in very modest changes in economic activity throughout the economy. The indirect impact on Chula Vista and other cities, in turn, will be very small. Both the direct and indirect effects of AB 32 will have a barely noticeable impact on residents—Chula Vista's budget, for example, would be fully restored by collecting just $1.97 more per year from each resident by 2020, less than the cost of a cup of coffee.

Chula Vista Case Study: Background

Chula Vista is the second-largest city in San Diego County, and is home to approximately 250,000 residents. The city government provided us with detailed data on its energy expenditures—including electricity, gas, and transportation fuel use—for the last several years. We used these data to develop a simple cash-flow model to project Chula Vista's expected future revenues and costs through 2020 under business-as-usual conditions. We compared the business-as-usual projections with alternative projections that also account for Chula Vista's proposed energy-efficiency plans and other climate-protection measures. We then applied to the alternative projections the changes in direct and indirect energy costs from implementation of the state's clean energy policies.

Crunching the Numbers

Under a business-as-usual scenario (i.e., without implementing any AB 32 clean energy policies), prices for electricity, transportation fuel, and natural gas are expected to increase 43 percent, 58 percent, and 71 percent, respectively, in California over the next decade. Chula Vista currently spends about 1.7 percent of its revenue on energy. Without implementing any AB 32 clean energy policies, but including aggressive energy efficiency measures Chula Vista has put in place to reduce its energy use, the city's spending on energy would increase about 25 percent (to 2.1 percent of total revenue) in 2020. Implementing AB 32 policies would increase this spending by less than 2 percentage points (to 2.3 percent of total revenue) by 2020.

These findings are very conservative in that they ignore the prospect that clean energy policies will lead to the creation of new businesses, jobs, and economic value that could more than offset the increase in energy costs. Local economic effects of energy efficiency retrofits and other locally implemented initiatives are not captured in the analysis. The analysis also does not take into account that if emissions continue unabated, Chula Vista and other cities may incur substantial costs as they prepare for and adapt to higher sea levels, increased heat, and other consequences of climate change. If this happens, the costs to cities from global warming may turn out to be much higher than the cost of implementing AB 32.

The full text of this study is available online at *www.ucsusa.org/ab32cityecon.*

I. INTRODUCTION

In December 2009, we released a report titled *The Economic Impact of AB 32 on California Small Businesses*. In October 2010, we released a follow-up report, *The Economic Impact of AB 32 on California Small Businesses – An Update*, which updated our initial report and included a new case study.[1] Both reports conservatively estimate the potential economic impacts California small businesses might experience under Assembly Bill 32 (AB 32), California's Global Warming Solutions Act of 2006. AB 32 established California's 2020 greenhouse gas emissions reduction target, requiring the state's emissions to return to 1990 levels by 2020, a reduction of approximately 12.5% from current levels and 40% from business-as-usual (BAU) in 2020.

Both prior reports presented two sets of outcomes based on our energy price forecasts resulting from an implementation of AB 32: a "Conservative" case and an "Extreme" case. The Conservative case was developed to illustrate a realistic, albeit conservative (i.e., overestimated), potential AB 32 impact. The Extreme case is based on assumptions at the upper limit of potential impacts with the purpose of presenting an estimate at the extreme upper bound of possible impacts of AB 32. Both of our prior reports showed that even sizeable changes in forecasted energy prices have only very minor impacts on small businesses.

Our prior reports include detailed discussions of the methodology and inputs we used to derive our estimates of AB 32's impact on energy prices. Rather than reproducing the same discussion in this paper, we refer the reader to our prior reports. The present report applies the same recently re-estimated impacts of AB 32 to a municipality, rather than to a small business. Specifically, in this report we analyze the impact of AB 32 on the City of Chula Vista, California, which is the location of the small business we considered in our prior report from October 2010.

This report stands in contrast to a recent report published by Thomas Tanton (Tanton Report) regarding the potential impact of AB 32 on local government budgets.[2] The Tanton Report predicts what it portrays as potentially significant estimated savings to several municipalities and government agencies resulting from passage of a failed ballot proposition (Proposition 23) to suspend AB 32.[3] According to that report, such savings would have resulted from lower energy costs and higher revenue levels than will be the case under AB 32. We consider those impacts on a single municipality, Chula Vista, in order to allow for a more focused analysis of how AB 32 might affect a given locality.

As in our prior reports relating to AB32's potential impact on small businesses, we find AB 32 likely will have only a minimal impact on Chula Vista. The main reason for this finding largely is the same as we explained in our prior reports. Like most small businesses, most local governments are not very energy intensive. Energy expenditures are only a relatively small share of a locality's total costs. Unlike our prior reports, however, this report did not limit the analysis to the direct effect of AB 32 on energy prices (i.e., the prices of electricity, natural gas, and transportation fuel). Instead, this report also considers the indirect impacts of higher energy prices

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1 Both of our prior reports are available for viewing or download on *The Brattle Group* website at www.brattle.com/Brattle_Economic_Impact_of_AB_32_Report.

2 "Local Agency Financial Benefits of Proposition 23," T^2 and Associates, August 2010. We discuss the Tanton Report in the Appendix to this report.

3 In the November 2010 election, California voters strongly rejected Proposition 23 by a vote of 62% to 38%, a 22% margin. (http://vote.sos.ca.gov/returns/ballot-measures)

on other input costs and on the resulting change in economic activity throughout the local economy translating into lower revenues for Chula Vista.

We find that even accounting for the indirect macroeconomic impacts of AB 32 in addition to direct increases in energy costs, AB 32 still will have only a very minor impact on the City of Chula Vista. Again, it all comes back to the theme identified in our first report on AB 32: the California economy, overall, is simply not very energy intensive.

Energy expenditures account for 7% of California's total income.[4] They account for less than 2% of Chula Vista's total expenditures.[5] It is important to note that even under BAU without AB 32, energy prices are expected to increase between 2010 and 2020. Over the next decade, BAU prices are expected to increase by 43% for electricity, 58% for transportation fuel, and 71% for natural gas.[6] With AB32, in our Conservative case, those energy costs increase by an additional 11%, 12%, and 20%, respectively.[7] This represents an energy cost increase under AB 32 relative to BAU of just 0.15% of Chula Vista's projected revenue in 2020.[8] To pass on the entire increase in energy related cost would require Chula Vista to collect an additional $1.97 per year from each resident in 2020.[9]

Likewise, the indirect impacts of AB 32 on the local economy of Chula Vista are estimated to be minor: a 1% change or less in employment, labor income, and the value of output produced by the local economy.[10] And this result entirely ignores the prospect that AB 32 will create new businesses, jobs, and economic value. It assumes, quite unrealistically, that Chula Vista will bear the full cost of AB 32 with no mitigating benefits. In reality, there is already some evidence that climate policies such as AB 32 will result in the creation of new businesses and new jobs. From 1998 to 2007, for example, California added the most "clean energy" businesses (10,209) and related new jobs (125,390) of any state.[11]

In the rest of this report, we summarize AB 32's estimated direct impact on energy prices based on our prior report. We then apply those estimates to cash flow projections for Chula Vista through 2020 to estimate the direct impact AB 32 likely will have on the City's budget. Then, we discuss the indirect impacts of higher energy prices as they flow through the local economy. We conclude by summarizing our results and their implications.

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4 In 2008, California's energy expenditures were $136.5 billion, or 7.4% of the state's $1.85 trillion gross domestic product for the same year. (Source: EIA State Energy Data System and the Bureau of Economic Analysis GDP–by–State Statistics.)

5 In 2009, Chula Vista's total expenditures on electricity, natural gas, and transportation fuels were nearly $5 million, relative to its total revenue of $298 million. (Source: City of Chula Vista).

6 BAU figures are based on the 2009 Integrated Energy Policy Report (IEPR) and hence do already take into account, at least to the extent reflected in the 2009 IEPR, the impact of the recent economic downturn.

7 See Table 1 on page 6 of this report, and the related discussion.

8 Under BAU, Chula Vista's energy costs in 2020 will account for 2.14% of revenue. This percentage increases to 2.29% in our Conservative case, or by 0.15 percentage points. Even in our Extreme case, the City's energy costs in 2020 increase by less than 0.5% of revenue.

9 See the discussion on page 7 of this report.

10 By comparison, the estimates in the Tanton Report (which are unexplained and unsupported) range from 0% to 5.88%. At the county level, it reports a revenue impact of just 2.27%, which is hardly "significant" over several years, especially relative to recent local budget shocks experienced as a result of current economic conditions.

11 The Pew Charitable Trusts, "The Clean Energy Economy," June 2009, Exhibit 1.

Notably, our analysis does not take into account that the BAU (*i.e.*, not lowering greenhouse gases in California over the next decade and beyond), may result in long-term consequences, at least in part due to climate change, that are more severe under BAU than under implementation of AB 32. In particular, Chula Vista may incur additional costs as it prepares for, and ultimately adapts to, the changes brought about by climate change. If this occurs, the costs to California under BAU may turn out to be higher than the cost of implementing AB 32.[12]

II. AB 32 COST IMPACTS

AB 32 will have both direct and indirect economic impacts on the California economy. The provisions of AB 32, which include a cap and trade program, a Renewable Electricity Standard (RES), and a Low-Carbon Fuel Standard (LCFS), will have a direct effect on the prices of electricity, natural gas, and transportation fuel. Changes in energy prices will, in turn, have indirect impacts on California's economy beyond the energy sector. The analysis in our prior reports estimated the direct impacts of AB 32. In this report, we also estimate its indirect impacts.

Our prior reports explained the analytic approach we used to estimate the potential impact of AB 32 on electricity, natural gas and transportation fuel prices. See those reports for a detailed discussion of how we estimated the direct impacts of AB 32.[13] We use the same analytic approach and the same estimated energy price impacts for the case study in this report on Chula Vista. Table 1 on page 6 of this report summarizes those direct impacts.

Our prior reports presented two case studies of how the direct impact of AB 32 on energy prices may affect individual small businesses in California. As we explained in those reports, the direct impacts of AB 32 on energy prices were so small that we did not further estimate any indirect impacts of how the direct changes in energy prices might indirectly affect the prices of the businesses' other inputs. Having already estimated the direct effects of AB 32 on energy prices to be insignificant on average, we did not analyze the indirect impact of AB 32 on small businesses.

For a municipality as a whole, however, the indirect impacts are a more relevant consideration. Macroeconomic impacts, such as changes in local employment and output, can affect the costs a municipality incurs as well as the revenues it can expect to realize. Typically, local revenues are realized from a mix of property taxes, sales taxes, and fees, all of which reflect the overall level of economic activity. If disposable income changes, for example, so too may property values, assessments, purchases, the number and profitability of businesses, and ultimately local revenues. Therefore, in addition to estimating the direct impact AB 32 might have on Chula Vista's budget from potential energy price increases, we also estimated the indirect impacts on Chula Vista of such price increases as they flow through the local economy.

III. CHULA VISTA: A CASE STUDY

In this section, we illustrate how a potential increase in energy costs due to AB 32 might directly affect energy-related expenditures, energy use, and revenue for the City of Chula Vista, California.

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[12] See, *e.g.*, David Roland-Holst and Fredrich Kahrl, "California Climate Risk and Response," November 2008.

[13] Again, both prior reports are available at www.brattle.com/Brattle_Economic_Impact_of_AB_32_Report.

A. SELECTING A LOCALITY

For this case study, we deliberately selected a mid-sized city whose characteristics typify many such cities in California. Chula Vista is the second largest city in San Diego County. Its current population is approximately 250,000 residents.[14] In the past decade, the City has experienced significant population growth (almost 43%), from approximately 175,000 residents. While this trend is expected to moderate somewhat, the City is nonetheless expected to have approximately 290,000 residents by 2020 and well over 300,000 residents by 2030.

Like many other cities in California and throughout the U.S., Chula Vista has experienced significant revenue reductions as a consequence of the economic slowdown starting in late 2007. In particular, the downturn in the housing market has resulted in foreclosures, lower property assessments, and less property tax revenue. To protect its General Fund reserves, Chula Vista implemented a comprehensive budget reduction plan, including the elimination of 98 positions and spending reductions of approximately $20 million in fiscal year 2009-10.[15]

To help us assess the impact of AB 32 on Chula Vista, the City provided us with detailed data on its energy expenditures, including electricity, gas and transportation fuel use. Below, we report the changes which result from applying the changes in energy costs from our Conservative and Extreme cases relative to the City's BAU baseline. We first developed a simple cash flow model to project Chula Vista's expected future revenues and costs through 2020 under BAU conditions.

B. THE BAU BASELINE

Our BAU baseline for Chula Vista is based primarily on the City's actual revenue and expenditure data from the past few years. In addition to revenue, we considered the current and expected trends in the City's three largest cost components: personnel, supplies and services, and capital improvements, which collectively account for two-thirds of the City's total costs. We also had data on all "other" non-energy related expenditures and projects, which we projected as a single line-item.

We separately projected Chula Vista's energy-related costs, including its expenditures on electricity, natural gas, and three types of transportation fuels: unleaded gasoline, diesel and compressed natural gas (CNG). More specifically, we used information on electricity, natural gas and transportation fuel consumption and expenditures for fiscal years 2006 through 2009 to develop a baseline of Chula Vista's current energy expenditures, both in terms of quantities consumed and total costs. Starting from this historical data, our BAU projections of Chula Vista's revenues and costs assume:

- Population grows linearly between 2010 and 2020 per Chula Vista's projections.
- Revenue per capita remains at current levels.[16]

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[14] City of Chula Vista, Economic Development Division, "City Profile and Demographic Trends," http://www.chulavistaca.gov/City_Services/Development_Services/RedevHousing/PDF/Demographics_20090817.pdf.

[15] City of Chula Vista, "5-Year Financial Forecast, Fiscal Years 2011-2015," https://www.chulavistaca.gov/City_Services/Administrative_Services/Finance/PDF/ForecastReportFY10toFY15.pdf.

[16] How revenues evolve over the forecast period is relatively unimportant, since the basic relationship between energy costs total expenditures, and revenues for municipalities (which generally have to balance their budgets over time) will change in order of magnitude.

- Electricity, natural gas, and transportation fuel use remain at current levels.[17]
- Electricity costs under BAU escalate at the rate in the California Public Utilities Commission (CPUC) High Net Short Scenario.[18]
- Natural gas costs escalate based on Chula Vista's actual rates inflated by the escalation of prices for natural gas forward contracts.
- No additional cost savings from energy efficiency (EE) beyond those already assumed in the CPUC's High Net Short Scenario.

Based on this set of inputs to our model, Chula Vista's energy costs increase from 1.7% of revenues today to 2.1% in 2020, reflecting inflation in energy prices of energy costs, particularly for electricity, even as Chula Vista uses less energy and even in the absence of AB 32.

C. ESTIMATED AB 32 DIRECT IMPACTS

Using the same cash flow model as for the BAU baseline, we developed cash flow projections for the Conservative and Extreme cases by applying the respective estimated increases in the costs of electricity, natural gas, and transportation fuel for each year of the forecast period from 2010 to 2020.

There are just two differences between the resulting estimated impacts for Chula Vista and the impacts listed in our prior report. First, Chula Vista pays different rates for electricity and natural gas than the small business profiled in our prior report. Therefore, the impacts we estimated in our prior report represent a larger percentage change from BAU prices. The dollar impacts are the same, but the percentage changes differ. Second, since Chula Vista uses three types of transportation fuel (unleaded gasoline, diesel, and CNG), we separately estimated Conservative and Extreme values for each fuel type.

Table 1 on the next page shows the resulting impacts we used for this case study.[19]

1. The Conservative Case

In our Conservative case, we deviate from the BAU baseline by applying the estimated AB 32 energy price impacts in the first column of Table 1. We estimate that AB 32 will increase electricity rates in the Conservative case over the BAU rates by an estimated 0.16 cents/kWh (1%) in 2011 (the first year of the RES) and by 2.46 cents/kWh (11%) by 2020 due to the costs of cap and trade, RES, and EE. Natural gas rates in the Conservative case will increase by 21 cents per therm (20%) by 2020. Overall, transportation fuel costs in this case increase by 33 cents/gallon (12%) by 2020.

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[17] Chula Vista's average annual usage actually has decreased over the last five years as a result of energy efficiency measures not included in our baseline projections. We did not assume that any further efficiency measures would be implemented in the absence of AB 32, which provides a conservative estimate of energy use under BAU.

[18] The CPUC's High Net Short scenario assumes 2020 load from the CEC 2009 IEPR forecast and no additional demand-side load reductions. See, *e.g.*, the E3 RES Calculator at www.ethree.com.

[19] Table 1 shows no LCFS impact on diesel or gasoline because low-carbon alternative fuels are less expensive to make in the Conservative case by 2020. Therefore, we assume low-carbon fuels will be priced at the price of conventional fuel.

Table 1: AB 32 2020 Impacts Relative to BAU (nominal dollars)

Commodity		Policy	Energy Price Increase from AB32 relative to BAU: Conservative Case $	Conservative Case %	Extreme Case $	Extreme Case %	Weight*	
Electricity	$/kWh	RES	$ 0.0076	*4%*	$ 0.0242	*11%*		
	$/kWh	Cap and Trade	$ 0.0111	*5%*	$ 0.0260	*12%*		
	$/kWh	EE & CHP	$ 0.0059	*3%*	$ 0.0072	*3%*		
		Total	**$ 0.0246**	***11%***	**$ 0.0574**	***27%***		*26%*
Natural Gas	$/therm	Cap and Trade	**$ 0.2123**	***20%***	**$ 0.5000**	***48%***		*24%*
Transportation Fuel								
CNG	$/gge	Cap and Trade	$ 0.2654	*14%*	$ 0.6250	*34%*		
	$/gge	LCFS	$ -	*0%*	$ -	*0%*		
		Total	$ 0.2654	*14%*	$ 0.6250	*34%*	*53%*	
Diesel	$/gallon	Cap and Trade	$ 0.4282	*10%*	$ 1.0084	*25%*		
	$/gallon	LCFS	$ -	*0%*	$ 0.8467	*21%*		
		Total	$ 0.4282	*10%*	$ 1.8551	*45%*	*16%*	
Gasoline	$/gallon	Cap and Trade	$ 0.3741	*9%*	$ 0.8810	*22%*		
	$/gallon	LCFS	$ -	*0%*	$ 0.8467	*21%*		
		Total	$ 0.3741	*9%*	$ 1.7277	*42%*	*31%*	
		All Fuels	**$ 0.3246**	***12%***	**$ 1.1605**	***38%***	*100%*	*51%*
		Overall (weighted)		***14%***		***38%***		*100%*

* Weights based on relative energy expenditures per EIA State Energy Data System (6/30/10). Transportation fuel weights based on Chula Vista fuel usage (2009).

In addition, our Conservative case also includes the potential cost savings from various energy efficiency measures Chula Vista may undertake going forward to mitigate the energy cost increases resulting from AB 32. Specifically, we assume Chula Vista will fully implement its current EE plan.[20] We forecast that the City will implement the measures in its EE plan over a three-year period, with equal capital expenditures occurring in each year. Accordingly, we project Chula Vista will realize a one-third share of the estimated electricity and natural gas savings in each year. In other words, we forecast that the potential energy savings included in the EE plan will ramp-up in equal increments over three years reaching their full potential in the third year. Thus, the Conservative case deviates from the BAU baseline by the amounts of the Chula Vista's projected EE capital expenditures, reduced energy usage, and corresponding cost savings.

Table 2 summarizes the cost to Chula Vista of making its projected EE investments and the resulting energy cost savings on a present value basis. According to the City's EE plan, the cost of EE over the three-year period between 2010 and 2012, stated in today's dollars, is just $675,000, or less than 0.08% of Chula Vista's revenue over the same period. In return, the resulting energy cost savings exceed $319,000, or nearly half the cost of the EE investment in real time, representing more than 2% of Chula Vista's total energy costs through 2012. Since these EE measures continue to provide energy savings for many years, Chula Vista's projected EE

[20] Chula Vista provided detailed data on the estimated savings from EE measures. For an overview of Chula Vista's "Climate Protection Measures", see its Implementation Progress Report dated February 10, 2010. (http://www.chulavistaca.gov/clean/conservation/Climate/documents/CCWGClimateMeasures_18-MonthProgressReport_FINAL.pdf)

investments pay-off quickly, in part, due to significant cash incentives currently available from utilities to local governments such as Chula Vista for implementing energy efficient projects.[21]

Table 2: Chula Vista EE Costs and Energy Cost Savings

Description	2010	2011	2012	Total, 2010-2012
Revenue	$ 308,433,493	$ 285,041,070	$ 263,352,777	$ 856,827,340
EE Cost	$ 246,590	$ 224,172	$ 203,793	$ 674,555
As % of Revenue				*0.08%*
Energy Costs	$ 5,036,675	$ 4,731,690	$ 4,600,070	$ 14,368,435
EE Cost Savings	$ 79,779	$ 123,691	$ 115,777	$ 319,246
As % of Energy Costs				*2.22%*

Source: EE estimates per Chula Visa plan; otherwise *Brattle* projections (discounted to PV at 10%)

Including the cost savings from EE, energy costs as a percent of Chula Vista's total revenue increase from 1.7% today to 2.3% in 2020 in the Conservative case. Even with AB 32, the City will spend only about 2% of its budget on energy. This increase can be entirely offset by raising annual revenues, depending on the year, by anywhere from 27 cents in 2015 to, at most, $1.97 per resident in 2020, or by just 0.15% of the City's current $1,243 average per capita revenue figure.[22] A surcharge of less than $2 per year by 2020, if perceptible at all, is very unlikely to be noticed by a typical Chula Vista resident on top of the current $1,243 average annual payment.

2. The Extreme Case

As discussed in our prior reports, our Conservative case very likely overstates the impact of AB 32. But we also present an Extreme case to indicate what AB 32's impact might be under an even more unduly pessimistic set of assumptions. The Extreme case deviates from the BAU baseline by applying the AB 32 energy price impacts in the second column of Table 1. By 2020, our extreme inputs increase: (1) electricity rates from BAU by an estimated 5.7 cents/kWh (27%), (2) natural gas rates by 50 cents per therm (48%), and (3) transportation fuel costs by $1.16/gallon (38%). We forecast the same EE investments as in the Conservative case, since at higher energy prices Chula Vista would have an even greater financial incentive to make those investments.[23]

Even in the Extreme case, we estimate that Chula Vista will spend just 2.7% of its revenues on energy. This increase can be entirely offset by raising annual revenues by less than $1 per capita through 2014, which increases steadily to $7.54 per capita by 2020. While significantly higher than the $1.97 increase in the Conservative case, even this $7.54 per capita increase is just 0.6% of Chula Vista's average revenue per capita. Again, it is an amount few, if any, Chula Vista residents are likely to notice.

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[21] For example, Chula Vista's EE plan reflects cost savings from incentives under San Diego Gas & Electric's Tax Exempt Customer Incentive Program and Standard Performance Contract. For a summary of SDG&E's EE incentives, see http://www.cacities.org/resource_files/27502.SDG&EResources.pdf.

[22] Chula Vista's current population is roughly 240,000 and its annual operating revenue is nearly $298 million, resulting in an average annual revenue per resident of $1,243.

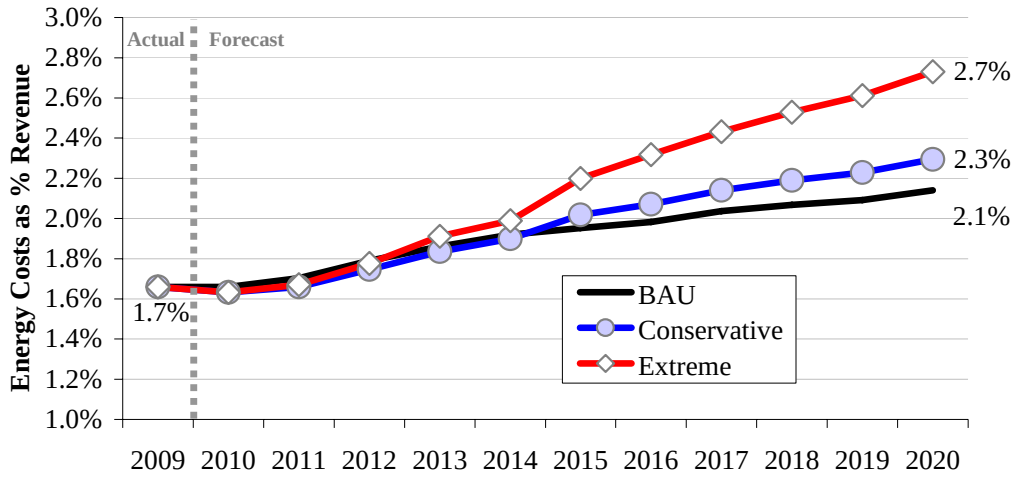
[23] We have not modeled any additional EE investments, which might become cost effective in our Extreme case, since energy prices increase by more than in the Conservative case, and any such additional EE investments would further mitigate the cost impact of AB 32.

The potential cost impact of AB 32, even in the Extreme case, is well within the range of Chula Vista's year-to-year variation in historic energy costs. The increases we forecast in Chula Vista's annual energy costs are similar to, or smaller than, the year-to-year swings in energy costs Chula Vista already deals with routinely. In the last two years alone, Chula Vista's historical data shows that it has experienced double-digit percentage changes in the rates it pays for every component of energy costs. In 2009, the average prices Chula Vista paid for natural gas, diesel fuel, and gasoline all decreased by double-digits after having double-digit increases in the prior year. At the same time, Chula Vista's average electricity rate increased by nearly 13%. In relative terms, the AB 32 energy price impacts we estimate are immaterial.

Our estimated cost increases are also tiny when compared to the overall revenue swings historically experienced by Chula Vista. For example, in our Conservative case, energy expenditures increase by roughly $500,000 per year by 2020. This is just a tiny fraction of the $20 million in lost revenues Chula Vista experienced in fiscal year 2009. Even in the Extreme case, the increase in energy costs represents only 10% of the $20 million in cost savings Chula Vista had to realize in the current fiscal year under the comprehensive budget plan it implemented in response to current economic conditions.[24] Unlike the economic downturn, any impact of AB 32 will be relatively predictable and phased-in over ten years, so Chula Vista's options in response are likely to be more numerous and less of a shock to the local economy.

Figure 1 shows Chula Vista's resulting projected energy-related costs (electricity, natural gas and transportation fuel) as a percentage of revenue at the BAU baseline and in the Conservative and Extreme cases. Chula Vista's energy-related costs in both the Conservative and Extreme cases increase as a result of AB 32. But the increase should not be large enough to attract much attention from the City or its residents. The energy cost increases, even in the Extreme case are quite small. From a 2009 baseline of 1.7% of revenue, energy-related costs increase to 2.1% in 2020 under BAU, 2.3% in the Conservative case, and 2.7% in the Extreme case.

Figure 1: Chula Vista's Energy-Related Costs as % of Revenue



[24] See *supra.*, fn. 17.

D. ESTIMATED AB 32 INDIRECT IMPACTS

In this section we analyze the extent to which AB 32 might impact Chula Vista not only through increased energy costs, but also how it might *indirectly* affect the City and similar local governments. All else equal, any such indirect impact of AB 32 (which the Tanton Report conversely characterizes as the benefit of suspending AB 32) would potentially result in somewhat reduced revenues to local governments due to higher energy costs being passed-through the local economy, for example, in the form of higher input costs, higher product costs, lower disposable incomes, less spending, lower profits, and/or less employment.

Before estimating AB 32's indirect impacts, we discuss the practical limitations of modeling such impacts. Then we present our own estimates. We provide a comparison of our estimates to the results in the Tanton Report in the Appendix.

1. Practical Limitations on Modeling Indirect Impacts

Our prior reports recognize the likelihood that the economic impact of AB 32 will not be limited to the direct effects on energy costs as we have estimated above. In addition, AB 32 likely will have an indirect impact in the form of lower levels of economic activity caused by cost increases which lead to higher prices and lower purchasing power. These indirect effects occur when higher energy costs filter through the economy and increase other prices based on the amount of energy used in their production and on the characteristics of supply and demand in their markets. However, since the California economy as a whole is not so energy intensive, such indirect effects – while real – are likely to be small. For example, energy costs currently account for 7.4% of California's total income, and less than 2% of Chula Vista's revenues.[25]

Previous studies of AB 32's overall impact find AB 32's total economic impact on the California economy (*i.e.*, the sum of all direct and indirect impacts) might be to lower total economic output by at most a couple of percentage points by 2020 relative to BAU.[26] That is roughly the equivalent of one year of GDP growth or less. Put differently, it will take until sometime in 2021 for California under AB 32 to reach the standard of living it otherwise would reach in 2020 - a few months to maybe a year earlier - under BAU. The net impact is estimated to be much smaller than, for example, the impact of the current economic slowdown. Rather than a sudden, unexpected shock, AB 32 is a known policy with predictable impacts to which California's economy likely will adjust more easily and at lower cost, given the time and ability to make efficient adjustment decisions.

However, estimating the overall (*i.e.*, direct and indirect) impact of a policy such as AB 32 at a more targeted level, such as a specific city, is more difficult because economic flows do not start and stop neatly along city limits. Broadly speaking, AB 32 will increase energy prices relative to BAU, but that increase will not affect every individual, business, or locality in the same way.

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[25] See *supra.*, fn. 4 and Figure 1.

[26] See, *e.g.*, California Air Resources Board (ARB), "Updated Economic Analysis of California's Climate Change Scoping Plan" (March 24, 2010); Charles River Associates, "Analysis of the California ARB's Scoping Plan and Related Policy Insights," (March 24, 2010); and Roland-Holst, David, "Climate Action for Sustained Growth: Analysis of ARB's Scoping Plan," (April 16, 2010). All three reports indicate the estimated cost of AB 32 will be very low. For example, the CRA report estimates annual per capita income in California may be 0.6% to 1% lower by 2020. The ARB's analysis of the same or similar scenarios projects impacts on per capita income between +0.1% and -0.6% per year.

Aside from its net cost state-wide, AB 32 likely will lead to a different pattern of wealth transfers than would have occurred under BAU. For example, AB 32's 33% RES will increase electricity rates. However, under the RES many new renewable power projects will be built. Research shows that non-fossil fuel technologies (*i.e.*, renewable energy and EE) create more net jobs per unit of energy than conventional technologies.[27] Renewable power also may lower long-run energy costs and/or become a source of incremental revenue. Where such new projects are built will determine who receives newly-created jobs and wages during the construction and operation of such facilities.

The 33% RES also means some existing fossil-fired power plants will produce less or shut-down, and those jobs and wages will be reduced.[28] However, it is difficult to say with any real certainty at the outset how such a dynamic will play out at the local level. In some sense, the more specific the locale, the more difficult the problem. However, this is a universal limitation of static economic models. As we have stated above, such models tend to be based on historical interactions across sectors or locations, and they are not designed to predict the dynamic effects of how new policies, such as AB 32, may fundamentally change historical relationships. To the extent new policies change historical relationships, estimates from static models will involve some estimation error. With this caveat, however, such models are commonly used to predict policy impacts, at least as a starting point, since historical patterns of economic interaction tend to change slowly over time.

The IMPLAN model used in both this report to estimate AB 32's potential indirect effects, and used in the Tanton Report (discussed further in the Appendix) for the same purpose, is one such model.[29] IMPLAN is an "input/output" model of how all of the sectors within an economy interact as dollars flow into and out of any one sector to other sectors. IMPLAN uses the historical relationships between as many as 440 different sectors as a starting point for estimating how economic outcomes such as employment and output will vary for a sector, or for a local economy overall, given a change in the dollar-value of activity in a particular sector, such as the energy sector. The model essentially calculates the incremental effect of flowing through the economy a change of some pre-specified dollar amount.[30] In this instance, that pre-specified amount is the direct change in costs related to higher energy prices resulting from AB 32 which will flow through the energy sector to the rest of the economy.

A caveat, however, is that input/output models such as IMPLAN are not designed to directly estimate the impact of price changes, such as the energy price increases likely to result from AB 32. Instead, IMPLAN has to be told how the various sectors in the model are expected to respond to a price change, and then the model will estimate the impacts of those responses flowing through the economy based on the historical pattern of purchases and sales across sectors and

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27 See, *e.g.*, Max Wei, *et al.*, "Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US," *Energy Policy* 38 (2010), 919-931.

28 Even now, for example, Chula Vista's South Bay power plant is expected to shut down after 2011. See, *e.g.*, http://www.kpbs.org/news/2010/sep/10/south-bay-power-plant-will-run-through-2011/.

29 For more information on the IMPLAN model, see www.implan.com.

30 A common criticism of using this type of input/output model to estimate the impact of policies like AB 32 over time is that, by necessity, such models use historically observed relationships between inputs and outputs as a starting point for assessing incremental change. In reality, some policies are intended to change those relationships. So using the past to predict the future may not capture the true impact of a policy change.

locales. In other words, the model estimates the indirect impact of a given price change by first converting that price change into a dollar-equivalent which flows through the various sectors of the economy.[31] If that conversion is not done reliably, or if the price change being evaluated would fundamentally change the historical relationships embedded in the model, then the results will involve some estimation error. With this significant caveat, we used IMPLAN in this report to provide at least a rough indication of what might be the potential indirect impacts of AB 32 on the City of Chula Vista. We did so, in particular, to derive results that can be compared to those in the Tanton Report, which claims to estimate at a very specific level (*e.g.*, various fire and police departments and school districts, in addition to cities and counties) the increased revenues that would result from suspending AB 32.

To perform our own independent, analysis, we estimated the jobs, labor income, and overall economic value the City of Chula Vista may lose under AB 32. Modeling Chula Vista using IMPLAN is possible because IMPLAN data specifying historical input/output relationships are available at the zip-code level. So we ran the model over the eight zip codes that comprise Chula Vista (91909 through 91915 and 91921). As we discuss in the Appendix to this report, the Tanton Report does not explain how it used IMPLAN results to estimate the indirect impact of AB 32 on specific local entities, such as police and fire departments. Doing so requires a range of assumptions and calculations outside of the model, the reliability of which cannot be vetted because the Tanton Report neither discusses nor discloses them.

2. Approach to Modeling Indirect Impacts

As we have explained, input/output models, including IMPLAN, do not directly model the impact of price increases. Instead, a given price change has to be translated into its impact on economic activity, i.e. purchases and sales across the sectors within an economy. We translate our estimates of AB 32's direct impact on energy prices (per Table 1) into decreased economic activity throughout the sectors that comprise Chula Vista's economy.

In theory, we want to measure the impact of a price increase in terms of the decreased economic activity it generates. For example, a price increase decreases local sales, which, in turn, flow through the local economy in the form of lower incomes and/or fewer jobs. In practice, however, we do not know the energy price elasticity of demand by sector (i.e., each sector's responsiveness to an increase in energy prices). Therefore, we estimate the impact of the price change by using the pattern of purchases and sales across sectors in IMPLAN to proxy for the price increase.

Specifically, we calculate the dollar equivalent of our estimated energy price increases and remove that amount of money from the local economy by flowing it through Chula Vista's energy-related sectors to the broader economy outside of the City.[32] The net effect is a dollar outflow from Chula Vista and a resulting change in the City's employment and income. This is the most conservative approach possible (*i.e.*, it maximizes the costs to Chula Vista) because it assumes that none of the additional costs will result in additional revenues within the City. In

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[31] See, *e.g.*, IMPLAN Support Forum, https://implan.com/v4/index.php?option=com_kunena&Itemid=11&func=view&catid=84&id=7338.

[32] In modeling terms, we reduce what IMPLAN calls the "local use of local supply" from energy-related sectors by the dollar equivalent of our estimated percentage changes in price. We then flow this reduction through all sectors (*i.e.*, in the form of reduced purchases by the energy-related sectors). The energy-related sectors replace these purchases from the local economy with purchases from outside.

reality, however, some of the additional cost likely will remain as revenues circulating within the local economy and will mitigate the indirect impact we estimate[33].

In addition, some part of the cost we estimate will be offset by new revenue Chula Vista and/or its residents may receive from the disbursement of the revenue raised from auctioning emissions allowances under AB 32's cap and trade program. This allowance revenue may be recycled to final consumers either through direct refunds to taxpayers or municipalities, through reduction of other income taxes, or through the use of those funds to finance other activities deemed to benefit taxpayers, such as energy efficiency measures. This is especially important given that energy efficiency investments will become even more cost-effective in response to modestly higher energy prices under AB 32. Recycling the revenues from emissions allowances will mitigate the cost impacts we estimate, since we do not account for such revenue recycling. To that extent, the net cost of AB 32 to Chula Vista will be less than we estimate.

In technical terms, we identified the sectors in the Chula Vista economy that best represent each of the three AB 32 energy price impacts we estimate, for electricity, natural gas, and transportation fuels. The sectors we identified are: electricity and distribution services, natural gas and distribution services, and retail gasoline stations, respectively. From IMPLAN data for the eight zip codes that comprise Chula Vista, we know each sector's local demand, the local supply that caters to this demand, and the imports necessary to reconcile the difference. We estimate the impact of the energy price increase by starting with the baseline economic activity among sectors using the IMPLAN data as is, and comparing that baseline to the level of economic activity that results from flowing through a reduction in local demand via the three energy-related sectors. The difference in economic outcomes between the baseline case and the price-affected case is the impact of the price increase.

In practical terms, for every $100 in baseline sales by Chula Vista's electricity sector, the 11% increase in electricity prices we estimate from AB 32 increases the electricity cost to all other sectors by $11 in proportion to their electricity purchases.[34] Chula Vista's electricity sector does not get to keep this $11 of value extracted from the local economy, but instead passes it through to the outside. Thus, our modeling approach maintains total commodity demand between the baseline and price-affected cases, but extracts from the local economy the dollar-value of the increased electricity cost and allows that cost increase to flow through the non-energy related sectors of the local economy.

3. Resulting Estimates

Table 3 shows the resulting indirect impacts of applying this modeling approach to the Chula Vista economy for the electricity, natural gas, and transportation fuel price increases shown in Table 1. The results indicate for the non-energy sectors in Chula Vista the percentage change in employment and in the dollar-value of economic activity, which includes labor income and economic value added (*i.e.,* the value of all output without double-counting inputs also produced locally, essentially a measure of local "GDP").

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[33] Alternatively, it is likely that similar revenues flowing out of other communities might partially flow into Chula Vista, thus also offsetting at least some of the outflows.

[34] This assumes the demand for electricity is inelastic, *i.e.,* there is no demand response to the price increase.

Table 3: AB 32 Indirect Impacts on Chula Vista

Description	Employment	Labor Income	Economic Value
Chula Vista local economy:			
Energy sectors	87	$ 80.8	$ 14.4
Non-Energy sectors	72,725	$ 3,783.2	$ 6,282.2
Total	72,813	$ 3,864.0	$ 6,296.5
AB 32 Indirect Effects on Non-Energy Sectors:			
Percent change	***-0.48%***	***-0.77%***	***-1.03%***
Dollar value	-352	$ (29.1)	$ (64.8)

Source: IMPLAN data and results. $ millions; employment in job-years.

The indirect effects of our estimated AB 32 energy cost increases on the City of Chula Vista by 2020 will be relatively minor. In percentage terms, the indirect effects of AB 32 are essentially within the margin of estimation error for such a model. Specifically, the higher energy costs we estimate in our Conservative case likely will reduce the value of all economic activity in Chula Vista by approximately 1%, or $107 million relative to a total economy of over $10 billion. The corresponding decrease in local employment is less than half a percent, or approximately 352 year-long jobs out of total employment of 72,725 such jobs.[35]

In assessing the relevance of this modeling result, it is important to note that the vast majority of jobs deemed to be lost at any geographic level will in reality be jobs gained in other ways. This means that the 352 jobs IMPLAN suggests will be lost in Chula Vista represent only half the picture. By not estimating how many jobs may be gained as a result of AB 32, the IMPLAN results exaggerate the likely job impact on Chula Vista. Even so, the estimated employment impact is minimal. To put this impact in context, Chula Vista's current unemployment rate is 12.4%,[36] with 11,500 people unemployed. Our estimate implies this number ultimately may increase under AB 32 by roughly 352 people, resulting in an unemployment rate of 12.8% rather than 12.4%. Again, all of these results assume, harshly and very unrealistically, that Chula Vista will bear the full cost of AB 32 with no mitigating benefits (*e.g.*, new businesses or jobs created within the local economy). Since modeling the potential mitigating benefits of AB 32 is beyond the scope of this report, essentially ignoring them means our approach is very conservative (*i.e.*, errs toward overstating the impacts of AB 32). In reality, however, such benefits ultimately will mitigate the cost we estimate here.

The same estimated percentage impacts can be applied to Chula Vista's local government to provide some sense of how AB 32 might affect the City at that level:

[35] A job-year is simply one job for one year. This is a way to allow for aggregation of employment effects over time, since jobs can differ in duration. 352 job years is 352 one-year jobs, or 176 two-year jobs, *etc.*

[36] California Employment Development Department, Labor Market Information Division, "Monthly Labor Force Data for Cities and Census Designated Places (CDP)," September 2010 preliminary figures, reported October 22, 2010. (http://www.labormarketinfo.edd.ca.gov)

Currently, the City employs approximately 864 people in various administrative, community service, development, legislative, maintenance and public safety jobs.[37] A 0.48% decrease in this employment due to AB 32 could result in a loss of 4 jobs. This impact is a small fraction of the staff reductions the City recently implemented as part of its Budget Reduction Plan, which ranged from 4% to 64% of total staff for various departments.[38] Between fiscal years 2007 and 2011, Chula Vista will have reduced its staff by 259 positions,[39] so the prospective and possible loss of 4 additional positions under AB 32 is well within Chula Vista's recent experience without AB 32.

A reduction in the value of economic activity in Chula Vista would, in turn, reduce local government revenue from sources such as property taxes and other local taxes. Such taxes are expected to total $97.0 million for the 2010 fiscal year, accounting for 30% of the City's $320.7 million in total revenue.[40] If that tax revenue decreases by 1% as a result of AB 32 per the estimate in Table 3, the City's tax receipts would be roughly $970,000 lower, or still $96.0 million in total. This potential revenue loss is only a small fraction of the 7% decrease in revenue the City experienced between 2009 and 2010 without AB 32, largely due to the declining housing market.[41] And again, this estimated impact does not account for the effect of new revenue sources AB 32 likely will generate in Chula Vista, which will mitigate any negative indirect effect of AB 32 on municipal revenue. Such new revenue sources may be quite material, since AB 32 requires energy efficiency investments, which are labor intensive, as well as renewable energy investments, which may be capital intensive.

Due to the inherent limitations of input/output modeling already discussed, we do not over-emphasize the precision of the estimated impacts shown in Table 3 and discussed in the preceding paragraphs. However, their message is clear: the indirect impacts of AB 32 on cities like Chula Vista will be minor. Saying so is not to minimize their importance to individuals who may be negatively impacted, but rather to put into perspective the relative magnitude of any such effects. For the City of Chula Vista as a whole and possibly for similar cities in California, the indirect impact of AB 32 likely will be insignificant, as will be the direct impact on Chula Vista.

IV. CONCLUSION

In this follow-up to our previous two reports on the likely small-business impacts of AB 32, we have applied our updated inputs for energy costs – specifically the prices of electricity, natural gas and transportation fuels – to a case study of the City of Chula Vista.

As with our small-business case studies, we find that even making extreme assumptions about the range of possible energy price increases that might result from AB 32 – including more aggressive assumptions than in our initial report – the impact on a typical, mid-sized California city, such as Chula Vista, remains very small. This observation should not diminish the real possibility that for cities already under severe financial stress as a result of the recent economic crisis, any cost increase may be difficult to internalize. But such situations are not atypical, and several provisions of AB 32 likely will not cause material changes in costs for several years, or after an economic recovery is well underway. Moreover, the increases we forecast in Chula Vista's annual

[37] City of Chula Vista, Proposed Budget FY 2010-11, p. 24.
[38] City of Chula Vista, 5-Year Financial Forecast, FY 2011-2015, p. 2.
[39] *Ibid*., p. 30.
[40] City of Chula Vista, Proposed Budget FY 2010-11, p. 9.
[41] *Ibid.*

energy costs are typically smaller than, the year-to-year swings in energy costs Chula Vista routinely faces.

Our Conservative case also assumes energy price increases that are likely higher than an unbiased estimate of the impact of AB 32 would yield. However, our Conservative case represents a more realistic view of the potential impact of AB 32 on Chula Vista. As we have shown, AB 32 would only result in higher energy costs representing an additional 0.15% of costs relative to BAU. An annual surcharge of less than $2 per resident by 2020 would suffice to fully offset the effect of AB 32 on Chula Vista's energy costs. It is difficult to imagine that Chula Vista would have difficulty passing through such a small cost increase to make AB 32 entirely revenue-neutral.

Likewise, the indirect impacts of AB 32 on Chula Vista also are estimated to be small. Even the Tanton Report discussed in the Appendix, which advocated for the suspension of AB 32, estimated these indirect effects to be between 0% to 5.88% for local government agencies, and 2.27% at the county level. Macroeconomic impacts of that magnitude do not constitute significant impacts when they occur over several years, especially relative to the far more severe budget impact the current economic and housing downturns have had on local budgets. Our independent estimates of the indirect impacts of AB 32 presented in this report indicate that AB 32 will result in less than a 1% change in employment, labor income, and the value of output produced within localities in California such as Chula Vista.

Again, our analysis does not account for the potential cost of doing nothing to lower greenhouse gas emissions in California over the next decade or more.[42] However, the cost of business-as-usual very well may be far more severe than the relatively minor cost we estimate may result from implementing AB 32.

[42] The economic cost to California of taking no action to reduce emissions has been estimated at $7 billion to $47 billion per year in direct costs, even higher indirect costs, and significant exposure to collateral risk. See, *e.g.,* Fredrich Kahrl and David Roland-Holst, "California Climate Risk and Response," November 2008. (http://nextten.org/pdf/report_CCRR/California_Climate_Risk_and_Response.pdf).

APPENDIX:

A BRIEF CRITIQUE OF THE TANTON REPORT

A recent report published by Thomas Tanton (Tanton Report) estimated the potential impact of AB 32 on local government budgets.[43] Rather than considering the indirect impacts of *implementing* AB 32 as we do, the Tanton Report estimates the indirect impacts of *suspending* AB 32. In theory, the resulting impacts are directly comparable, just with the opposite sign. All else equal, a savings from lower energy costs in the Tanton Report is equivalent to the energy cost increases from AB 32 estimated in this report. In practice, however, our respective results turn out to be very different, in part due to differences in the modeling inputs between that report and this one. This Appendix discusses those differences in more detail.

The Tanton Report uses IMPLAN to estimate the indirect economic impacts of AB 32, which is one reason we also used IMPLAN to generate our own estimates of the indirect impacts of AB 32. The Tanton Report also describes the assumptions it made regarding the direct impacts of AB 32, which we estimate in our prior reports. We think several of the assumptions in the Tanton Report are questionable. For example:

1. Cap and Trade

The Tanton Report does not specify any assumptions relating to certain features of AB 32, most notably the cap and trade program. Even though the issue is discussed in the report's appendix, it is unclear whether the assumptions used in the Tanton Report include any impact of such provisions on the prices of electricity, natural gas, and transportation fuel, as we provided in our prior reports and as we show in Table 1 of this report.

2. Renewable Energy Standard

The Tanton Report makes assumptions about electricity price increases due primarily to the 33% Renewable Electricity Standard under AB 32. It claims to base its electricity price forecast on the analysis of the California Public Utilities Commission,[44] and yet it deviates significantly from the CPUC analysis. The Tanton Report acknowledges that the CPUC predicts a 7% price increase by 2020 relative to BAU. Instead, however, the report assumes a 30% increase by 2015, which it justifies by claiming: (1) the CPUC price projections increase more rapidly early-on, while some renewable technologies still are maturing, and (2) the CPUC projections do not account for the discovery of substantial additional gas supplies that will be available under BAU and will thus lower the prices of natural gas and electricity under BAU.

Arbitrarily choosing 2015 as a base year and assuming, *ad hoc*, a 30% electricity price increase seems opportunistic and is likely to significantly exaggerate the economic impact of the RES. For example, a 30% increase in electricity prices, alone, represents almost the entire electricity price impact we estimate will result from the combination of the cap and trade program, the 33% RES, and the cost of efficiency measures under our Extreme (*i.e.*, already unduly pessimistic) case. In

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43 "Local Agency Financial Benefits of Proposition 23," T^2 and Associates, August 2010. We discuss the Tanton Report in the Appendix to this report.

44 Tanton Report, p. 7.

our more realistic Conservative case, the combined impact of cap and trade, RES, and efficiency measures is just 12% relative to BAU.

3. Low-Carbon Fuel Standard

The Tanton Report also makes assumptions about the impact of the Low Carbon Fuel Standard on transportation fuel prices. It rejects the LCFS price impact estimated by the California Air Resources Board. It cites the ARB's estimate that ethanol will cost $2.70/gge as compared to $2.42/gallon for gasoline and $2.48/gallon for diesel.[45] However, it instead assumes a $3.98/gge ethanol price based on an independent research report[46] and claims to have assumed a "conservative" 25% price premium for ethanol over conventional transportation fuels.

The Tanton Report does not disclose how its assumption about the cost of ethanol impacts the cost of transportation fuels. This assumption is important since, under the LCFS, only a part of conventional transportation fuels will have to be replaced with lower-carbon substitutes. Specifically, the LCFS requires the carbon content of transportation fuels to be reduced by just 2.5% by the 2015 base year used in the report, and by 10% by 2020.

The Tanton Report also does not specify what type of ethanol it assumes will be used to meet the LCFS. In our prior report, we assumed the most expensive (in terms of dollars per unit of carbon reduction) currently-available low carbon fuel alternative (Brazilian sugarcane ethanol) will be used to comply with the LCFS. At its carbon content, Brazilian sugarcane ethanol would have to represent 11% of California's fuel mix by 2015 to meet the LCFS. Even at the ethanol price assumed in the Tanton Report, therefore, the 2015 increase in gasoline prices due to the LCFS would be just 9 cents/gallon relative to BAU.[47] By 2020, the implied increase relative to BAU is 44 cents/gallon, or roughly half-way between our Conservative and Extreme case assumptions.[48] Importantly, this would be in the context of conventional gasoline prices increasing to above $4/gallon under BAU, entirely as a result of projected increases in oil prices. This means that by 2020 the increase in gasoline prices due to higher oil prices is projected to be three times as large as the increase due to the LCFS under the Tanton Report's assumptions, and would be negligible in 2015. However, it is unclear how the Tanton Report translated its assumed 25% price premium into resulting increases in gasoline prices.

4. General Critiques

As a general matter, the Tanton Report does not provide enough information about how it modeled various aspects of AB 32 to fully understand whether its assumptions about energy cost increases under AB 32 are higher, lower or similar to the inputs we use. For example, it is unclear

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45 *Ibid.* The Tanton Report does not indicate the corresponding year.

46 Sierra Research, Inc., "Preliminary Review of the CARB Staff Analysis of the Proposed Low Carbon Fuel Standard," April 8, 2009. We have reviewed this report and find many of its assumptions highly questionable. For example, it assumes crude oil prices will remain low, at $66/barrel, through 2020, resulting in a baseline gasoline price of just $2.42 per gallon.

47 We estimate the California baseline fuel price in 2015 to be $3.40/gallon. A 25% price premium for ethanol implies a price for gallon of gasoline equivalent of $4.24. Assuming that ethanol would have to represent 11% of the fuel mix to comply with the 2015 LCFS, this would increase the cost of the blended low carbon fuel from $3.40/gallon to $3.49/gallon.

48 The 44 cents are derived the same way. By 2020, baseline fuel prices are assumed to be$4.09/gallon and 43% ethanol would be needed to comply with the LCFS.

how Tanton translates an assumed 25% price premium of ethanol over gasoline and diesel into assumed average transportation fuel prices under the LCFS.[49] It is possible that the Tanton Report made errors or unduly extreme assumptions in developing such inputs, but it is impossible to know based on the paucity of source and reference documentation provided in the report.

Although the Tanton Report does not explain how it derives specific AB 32 impacts at the entity level, its results provide some indications that those results may be spuriously precise. One such indication is that the percentage impacts in the Tanton Report[50] appear not to be specific to the entities listed. Rather, the entities appear to have been grouped into different categories, within which all entities are assigned the same budget impact.

For example, all fire and police departments on Table 4 of the Tanton Report are assigned the same 5.88% revenue increase from increased economic activity; both counties receive the same 2.27% revenue increase; and all but one water district receives the same 0.16% revenue increase. For reasons the Tanton Report does not explain, its reported revenue impacts vary only across cities, but all four cities receive the same 1.15% estimated energy cost savings. Clearly, the modeling produced a limited set of estimated impacts which then were assigned to various types of entities, but with no explanation of the underlying assumptions. There is no way, therefore, to judge the reasonableness or reliability of the estimates, so we view them skeptically. The lack of modeling transparency and source documentation significantly diminishes the credibility of the Tanton report.

Even taken at face value, the results of the Tanton Report appear to contradict its overall conclusion that suspending AB 32 will result in a "significant positive impact" on local government budgets.[51] The Tanton Report estimates (at best unexplained, and possibly unreliable) revenue increases ranging from 0% to 5.88% by some unspecified year (presumably 2015, but maybe 2020) over all of the local governments/agencies listed in Table 4 of that report. At the county level, its reported revenue impact is just 2.27%, hardly a "significant" impact over a 5-10 year period, especially relative to the revenue losses municipalities have experienced as a result of current economic conditions.

Viewed from that perspective, the results of the Tanton Report are unalarming, unsurprising, and provide little or no new information. The only alarming feature of the results is the extent to which they are unexplained and hyperbolized. We think our estimates of the potential indirect impact of AB 32 on the City of Chula Vista, which are based on a more transparent set of inputs about AB 32's direct impact on energy costs, are a reality check on the results and conclusions of the Tanton Report and are a more reliable indicator of the potential indirect impact of AB 32 on local governments in California. Bearing all of this in mind, we generally find the assumptions in the Tanton Report to be poorly-documented and largely arbitrary, which make us skeptical of the accuracy and reliability of its results. Indeed, the results we derive based on well-documented and established sources result in estimated energy cost impacts which differ substantially from the results of the Tanton Report, but are consistent with the results of our prior reports and with other published reports.[52]

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49 Tanton Report, p. 7.
50 See, *e.g.*, Tables 4 and 5 at pages 9 and 10 of the Tanton Report.
51 Tanton Report, p. ii.
52 See *supra.*, fn. 28.