

**A Review of Cost of AB 32 on California Small Businesses—Summary Report of Findings
by Varshney & Associates**

Matthew E. Kahn
UCLA and NBER
Professor, Institute of the Environment
Department of Economics
Department of Public Policy
mkahn@ioe.ucla.edu

September 21th 2009

Introduction

In June 2009, Sanjay B. Varshney and Dennis H. Tootelian released a report investigating the costs of AB 32. This consulting project was commissioned by the California Small Business Roundtable in March 2009. To quote these authors, “The purpose of this study is to identify and establish the various impacts and cost of the AB 32 burden on small business in California and to assess the extent to which this disadvantages small business.” This report’s “bottom line” is that AB 32 imposes extremely high average costs on Californians. The authors estimate an annual cost per Californian household of \$3,857.

This is an enormous number that merits attention and scrutiny. Based on year 2000 Census of Population and Housing Data, average household income in California was approximately \$64,720. Assuming a 33% marginal tax rate, the Varshney and Tootelian estimate (hereafter the VT Study) implies that the average California household will be spending 9% of its after tax annual income on AB 32 related regulatory costs. In this review, I will demonstrate that these consultants’ cost estimates are fatally flawed and vastly over-state the expected costs of compliance with AB 32.

An Examination of the Varshney and Tootelian’s Cost Estimate of \$3,857

As stated on page 32 of their report, the \$3,857 can be decomposed into five pieces. First is an extra \$2,048 for housing, second is \$756 for transportation, third is \$35 for natural gas, fourth is \$124 for electricity and fifth is \$895 for food. In my review, I will focus on the housing, transportation and food components.

Could AB 32 Cause a \$2,048 Annual Increase in Household Housing Expenditure?

Here is the consultants' statement for how they generated their housing cost component number.

“Housing costs: This includes the increased costs of new housing and possible retrofitting of existing homes in an attempt to adjust to higher costs of utilities (see below). It has been estimated by the AB 32 Implementation Group that AB 32 would add approximately \$50,000 to the cost of a new home. Because the median new home price in 2008 was \$335,990, this represents an increase of 14.9% in the cost of housing. Applying this percentage to what consumers spend for their dwellings excluding mortgage/rent results in a cost increase of \$2,048.” (Page 32 of the Report)

Analysis of this claim:

AB 32 will induce energy efficiency investments for new housing. This will increase the fixed cost of building a home but the new home will now be more energy efficient than in the absence of AB 32 and thus may require a smaller annual subsequent electricity and energy expenditure. The consultants appear to ignore this second point. The consultants have also ignored the point that the housing stock is durable and that only a small fraction of the stock is built each year. As I understand the regulation, only new housing will be subject to the AB32 regulatory codes. This means that only a small share of the aggregate housing stock will be subject to this regulation over the first ten years of its implementation.

The authors estimate that AB 32 will add \$50,000 to the cost of constructing a new home (page 32). This number comes from a National Renewable Energy Laboratory study estimating the incremental cost of constructing a Zero Net Energy home and includes figures such as \$31,500 for a solar PV system, and over \$10,000 for new heating and cooling appliances. The Scoping Plan sets an energy efficiency goal but does not require any specific investment in energy efficiency for new construction or existing homes. Therefore, it is difficult to understand how the authors conclude that each home would be required to make such a substantial

investment. Further, the authors fail to include any costs savings associated with the switch to Zero Net Energy and instead assume that energy costs would increase by \$159 instead of decreasing by \$1,565 (the authors estimated annual household energy expenditure).

Suppose that the average household who lives in a newly constructed home in California has an annual electricity bill of \$900 a year in the absence of AB 32. If AB 32's mandates reduce electricity consumption by 50% then this household's electricity bill will be \$450 a year lower. This reduction in household electricity expenditure caused by AB 32 should be counted by the VT study as a "negative cost".

The Varshney Report does not include ANY of the potential savings from implementing AB 32. By contrast independent estimates by consulting firm McKenzie & Co. and Stanford Professor James Sweeney both include significant savings from investment in energy efficiency. The authors claim such savings are "too speculative to consider" (page 31) despite the fact all electric utilities have programs to implement cost saving energy efficiency.

If energy prices increase over time, then the energy efficiencies required by AB 32 would impose even lower costs on California households. Why? If energy prices increase, more energy inefficient homes will face even higher electricity bills (perhaps \$1,200 a year rather than the \$900 a year assumed above). In this case, increased energy efficiency translates into an even smaller total electricity bill.

Could AB 32 Cause a \$756 Increase in Annual Transportation Costs?

Here is a direct quote from the VT study.

"Transportation costs: Higher costs of fuel are likely to occur because consumers will have to purchase new cars, which provide better gas mileage, have their cars retrofitted to obtain better gas mileage, or simply pay the higher costs of gasoline/diesel. In its Scoping Plan, ARB indicated that the savings in fuel costs for new car buyers is \$30 per month. Since the average

household has 2.1 vehicles, this cost for those who cannot afford to, or will not, purchase new vehicles is \$756. It will, of course, be even higher for those that purchase new cars and the savings over time are still uncertain.” (Direct Quote from page 32).

Analysis:

VT’s stated goal is to calculate the cost to California small businesses of AB 32. In this subsection, they incorrectly focus on the subset of vehicle owners “who cannot afford to, or will not, purchase new vehicles”. This makes no sense. The subset of owners that VT focus on are a small unrepresentative set of California’s vehicle owners. In measuring the impact of AB32 on household transportation expenditure, the key factor is vehicle owner behavior. Each vehicle owner knows that vehicles are durable, and do not last forever. At some point, a vehicle owner will need to replace his/her current vehicle.

AB 32 will increase the fuel economy of the new vehicle fleet. Assuming that households do not increase their miles driven when they drive a more fuel efficient vehicle, then regulated increases in new vehicle fleet economy reduce household gasoline consumption. If a household’s gasoline consumption declines over time by a larger percentage than the price of gasoline increases over time, then household expenditure on gasoline can decline because of AB 32.

To appreciate this point, consider the following explicit real world example. I make several assumptions. It is straightforward arithmetic to alter these assumptions below. Assume that the Scoping Plan’s assumptions are correct that required increases in fuel economy for new vehicles will save new car buyers \$360 per year in lower gasoline expenditure. Also assume that because of AB 32 regulation that car owners who do choose to keep their “old” cars now face a 10% higher gasoline price per gallon. Assume that the price of gasoline is \$3 per gallon in the

absence of AB 32 regulation and that AB 32's carbon pricing raises the price of gasoline by 30 cents to \$3.30.¹

Finally, I assume that the average vehicle is driven for twenty years before it is recycled for scrap metals. Under these assumptions, 5% of the fleet is scrapped each year. I follow VT and assume that each household owns 2.1 vehicles. I assume that each vehicle is driven 12,000 miles per year and that the average fleet fuel economy for used vehicles is 25 MPG and the average fleet fuel economy for new vehicles under AB 32 is 40 MPG.

Under these assumptions, how is the average household's expenditure on transportation affected by AB 32? In year 1 after AB 32 is implemented, 5% of the households buy a new vehicle and 95% continue to drive their original vehicle. Total household gasoline expenditure in year 2 equals:

Equation 1: $2.1 * (.95 * (12000/25) * 3.30 + .05 * (12000/40) * 3.30) = \$3,264$

In year 2 after AB 32 is implemented, 10% of the households now own a new vehicle and 90% continue to driver their original vehicle. Total household gasoline expenditure in year 1 equals

Equation 2: $2.1 * (.90 * (12000/25) * 3.30 + .10 * (12000/40) * 3.30) = \$3,201$

¹ Leading economists such as Nicholas Stern have argued that the social marginal damage caused by a ton of carbon dioxide is roughly \$35. In this case, an extra gallon of gasoline consumed creates a social cost of roughly 30 cents. Here I assume that AB 32's Cap and Trade policies cause gas prices to rise by this amount.

Over time as the fuel inefficient vehicles exit the fleet, note that this expenditure is declining! Ten years after AB 32 is implemented the annual average household expenditure (under the assumptions listed above would equal: $2.1 * (.50 * (12000/25) * 3.30 + .50 * (12000/40) * 3.30) = \$2,702$.

What is the right “No AB 32” baseline for comparing these expenditures to? In the absence of AB 32, the average California household would have spent $2.1 * (12000/25) * 3$ which equals \$3024 per year on gasoline. The average household would have continued to drive a vehicle that achieves 25 MPG and the price of gasoline would have been \$3 per gallon.

Comparing the annual flow of \$3,024 on gasoline expenditure in the absence of AB 32 with the linear trend presented in Equations 1 and 2 above it is clear that over a ten year basis the cumulative household expenditure in both cases is roughly equal! Thus, I reject VT’s claim that the annual increase in expenditure is \$756. Instead, the right number to use is \$0!

In fairness to VT, they do correctly note that households who choose to continue to drive fuel inefficient vehicles will face higher annual gasoline bills if AB 32’s cap and trade regulations do lead to higher gasoline prices. Under the assumptions listed above, such a household would now face a higher annual bill of $2.1 * (12000/25) * .30 = \302 . If gas prices do not rise in the face of AB 32, then owners of fuel inefficient vehicles would experience no change in their gasoline expenditures.

As demonstrated in the Summer of 2009 by the popularity of the national “Cash for Clunkers” program, owners of energy inefficient products will be likely to be offered explicit incentives to receive cash to scrap their current products.

Could AB 32 Cause a \$895 Increase in Annual Food Costs?

Here is a direct quote from the VT study. “Food costs: Higher costs of transportation, utilities, etc. undoubtedly will increase the costs of food products, whether it is for in-home use or dining outside the home. Given that the cost of food is highly dependent on transportation, utilities, etc., it was assumed that the rise would be approximately half of the increased costs of gasoline and automobile maintenance (i.e., 11.71% of the current costs). It is highly likely that other costs will increase as well.” (page 33)

Analysis: Households spend about 10% of their disposable income on food see

<http://www.ers.usda.gov/Publications/SB965/sb965e.pdf>. Year 2000 Census data indicates that the average California household’s income is \$64,720. Assuming that this household pays 33% of this income in taxes, then its annual expenditure on food equals \$4,271. For VT’s estimate to be correct, AB 32 would have to increase this average household’s annual food cost by 21%.

This strikes me to be an enormous number.

VT are correct in stating that in the very short run that for profit food sellers such as supermarkets will try to pass on higher costs of air conditioning and trucking to final consumers. But, in the medium term such profit maximizing firms will respond to AB 32 by shifting the types of trucks they rely on for shipping (see my discussion of the vehicle fleet above) and they will invest in more energy efficient durables that economize on their electricity consumption. The net effect of this “greener” investment profile is that in the medium term and long term California food consumers will not face significantly higher food prices because of AB 32. I would be shocked if the medium term price increase is greater than 5%. VT are implicitly assuming that California’s food sellers are locked into “old ways” of distributing food and selling food and will not re-optimize and change their behavior in the new carbon regulated economy. Yet this logic defies 200 years of economic analysis dating back to Adam Smith. We know that everyone in a market economy responds to market incentives but VT ignore this point. This is why they generate such a large cost number.

Opportunities for Small Businesses Caused by AB 32

Predicting the future is certainly challenging but California's willingness to commit itself to reduce its greenhouse gas emissions signals a growing market for many small businesses. AB 32's innovation incentives will create many new opportunities for firms that exist today and will be born in the near future. VT openly acknowledges that their report solely focuses on the costs imposed by AB 32 but small businesses would be wise to also consider the benefits that this regulation will offer.

President Obama's vision of new "green jobs" will become a reality in California as new firms will form for creating inputs in renewable power generation, and manning construction sites for retrofitting existing commercial buildings. This is just the tip of the iceberg. With the rise of "smart grid" home energy meters, households and firms will be actively monitoring their energy consumption and will be quick to call in "weatherizers" and energy consultants to help them minimize their energy inefficiency. This new demand creates jobs that have valued added for workers and for decarbonizing our economy. Many of the small businesses that will thrive in the post AB 32 economy have not been born yet. There is a fundamental asymmetry here. There are existing firms who have made costly investments in energy intensive durables. In a carbon constrained economy, such firms will regret these investments.

The Bottom Line

The VT study asks an excellent question; “How Will Small Businesses be Affected by AB 32?” To answer this question, they attempt to quantify how the average California household will be affected. If households face a high regulatory tax due to AB32 then they will have less disposable income to purchase the products from small businesses. VT conclude that AB 32 will make each household’s real purchasing power decline by \$3,857 per year. In this review, I have highlighted the flaws in their logic. I would not be surprised if the true household annual cost is closer to \$300.

Beyond over-stating the annual cost of regulatory compliance, the VT study ignores the salient fact that any expenditures that California households make to comply with new AB 32 regulation will create new opportunities for California businesses. When my family pays for a weatherizing team to improve my home’s energy efficiency, the money I pay this team is used by the workers on that team to pay for goods and services they want to consume. Small businesses will provide many of these services and the owners of these firms will profit from this “greening” of the California economy. VT ignores this fact and appears to implicitly assume that each household takes \$3,857 each and throws this amount of money into the Pacific Ocean but this defies the basic logic of how a free market operates.

One legitimate concern about how AB 32 will affect California’s small businesses merits mentioning. If California unilaterally enacts AB 32 **and** the rest of the nation enacts no carbon mitigation regulation, then it is possible that California could lose manufacturing jobs as they migrate to other states featuring laxer carbon regulation. This is called the “leakage effect”. This effect would be most likely to take place for energy intensive industries especially if AB 32 causes a significant increase in electricity prices. While this theoretical concern is correct, there are two pieces of good news here. First, in June 2009 the U.S House of Representatives voted in

favor of the American Clean Energy Solutions Act. This anti-carbon regulation indicates that the rest of the country is following California's lead. In 2015, it is highly unlikely that there will be an "unlevel playing field". California and the rest of the nation are highly likely to have all enacted anti-carbon regulation. Thus, manufacturing is unlikely to gain a cost advantage by seeking out other locations within the United States.

While it remains an open question whether AB 32 regulation will significantly increase the state's electricity prices, in preliminary research (joint with Professor Erin Mansur of Yale's Business School), I find that only four manufacturing industries are statistically significantly more likely to cluster in counties with lower electricity prices. These four industries include; Primary Metal Manufacturing (NAICS 331), Paper Manufacturing (NAICS 322), Textile Mills (NAICS 313) and Nonmetallic Mineral Production (NAICS 327). Even for these four energy intensive industries, we find relatively small effects. They cluster in low energy price areas but the size of this effect is not "big potatoes". Intuitively, these results indicate that rising electricity prices will not have a serious "leakage" effect on California manufacturing. While we do not know if AB 32 will cause electricity prices to rise, based on the historical experience from 1998 to 2006, we downplay the importance that such an electricity price increase could have on accelerating the deindustrialization of California. Opponents of AB 32 must look beyond its impact on manufacturing and small businesses in pinpointing a convincing argument for opposing this regulation.