



### California's Climate Policy – Why It's Good for Business

Is climate policy good for business? Are California citizens better off as a result of the state's policies? We think the answer is yes, and in this article we take a look at both the positive and negative economic impacts of climate policies and why some economic analyses widely differ in their outcomes. While we use data from California, we believe similar arguments would hold true for well designed Federal policies.

Most of what we need to do to address climate change is also needed to grow jobs and new industries in California and to improve our energy security. Our current economy is dangerously tied to fossil fuels whose price volatility can disrupt our economic recovery. To the extent that these fuels come from abroad we also export economic activity that could have elevated domestic prosperity.

As the chart at right shows, the rising costs of fossil fuels as forecasted by the U.S. Department of Energy will cost the California economy \$84 billion in lost gross state product and a resulting loss of 626,000 jobs. Measures proposed by California climate policies could mitigate higher fossil fuel costs and also create a net increase in economic output (\$104 billion improvement) and jobs (738,000 increase) through investments in clean energy.<sup>1</sup>

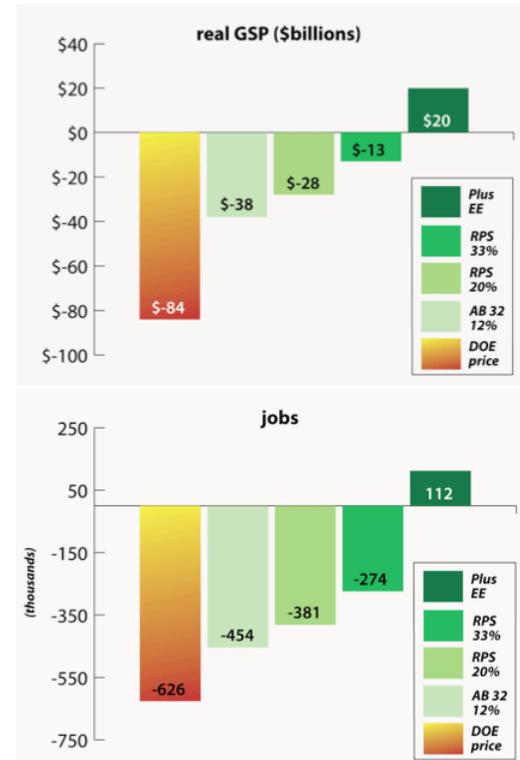
#### A Quick Synopsis of AB 32

It has been nearly four years since California enacted the Global Warming Solutions Act (AB 32) and started developing a comprehensive set of climate policies that will reduce global warming pollution at a net economic benefit to the state. The last four years have seen strong clean energy development and the clean energy economy has weathered the economic recession better than most sectors.

AB 32 authorizes the California Air Resources Board (CARB) as lead agency to design and implement a set of policies that will reduce greenhouse gas (GHG) emissions down to 1990 levels by 2020 and accomplish this in a cost-effective manner with co-benefits of reduced pollution.<sup>2</sup> The governor's accompanying Executive Order S-3-05<sup>3</sup> of 2005 calls for a reduction of 80 percent below 1990 levels by 2050. While AB 32 does not set explicit targets beyond 2020, California is expected to aim for 80 percent reductions either through its own policies or as part of a federal program.

To put the reductions in context, in 2006, per-capita emissions in California were 14 tons of CO<sub>2</sub>e (carbon dioxide equivalent) per year. By 2020 that needs to be reduced to 10 tons/year and by 2050 per-capita emissions would need to be 1.5 tons/year. Achieving these reductions is made more challenging by the need to accommodate population and economic growth. California is planning to grow from 37 million people today to 55 million by 2050.

Figure 1. Comparing economic effects of climate policy implementation alternatives



Relative impact on Gross State Product and jobs under different policy options, from business-as-usual on the left of each chart to full implementation of AB 32 on the right.

## By the Numbers

The climate policy plan, as adopted in December 2008, defined a reduction of 174 MMT (million metric tons) from expected business-as-usual emissions in 2020 primarily through **six main measures that will achieve over 85 percent of the total reductions**:

1. Cleaner vehicles – The “Pavley” standards<sup>4</sup> will reduce emissions from passenger vehicles by an estimated total of 32 MMT. Vehicles will cost less to operate resulting in a net savings for the owner over the life of the vehicle.
2. Energy efficiency – Additional energy efficiency measures (building and appliance standards as well as other measures) will reduce demand, resulting in a savings of 26 MMT. As demand is reduced, it both saves money for the building owner and puts downward pressure on energy prices for everyone.
3. Renewable Portfolio Standard of 33 percent – Moving from the 20 percent renewable electricity standard in 2013 to 33 percent by 2020 will cut 21 MMT. Analysis shows that expected lower prices for renewables coupled with forecasted increased prices in fossil fuels can result in cheaper electricity costs under a 33 percent RPS compared to business as usual.<sup>5</sup>
4. Low Carbon Fuel Standard (LCFS) – Major distributors of transportation fuels are required to reduce the “carbon intensity” of their fuels by 10 percent by 2020. This can be done through a variety of measures including fuel switching to electricity and fuels made from non-fossil sources such as biomass and algae. This will cut 15 MMT of emissions. There is strong evidence that non-fossil fuels can be cost competitive with fossil fuels when oil remains over \$70/barrel.
5. High Global Warming potential gas reductions – Certain specialty gases have very strong global warming effects and can be phased out of commerce. These result in a decrease of 20 MMT.
6. Market Measures – About 20 percent of the total reductions, or 34 MMT, are reduced through a cap on emissions and a trading mechanism known as “cap-and-trade.” The intent is to create an incentive for companies with the lowest cost reductions to reduce more than required and to sell the excess reductions to others. Overall this reduces the cost of the program. The cap covers less than 800 companies. The cap does not begin until 2012 and some companies may not be covered until 2015. The cap is the only program of the six mentioned here that directly imposes a new cost on emissions.

The inventory of greenhouse gas emissions has changed due to the economic recession's impacts on business activity. As a result, the required reductions will be less than the original 174 MMT reductions defined in the Scoping Plan. CARB staff estimates that the revised economic forecast will reduce projected business-as-usual 2020 emissions by approximately 25 MMT.<sup>6</sup>

## Why is Climate Policy Good for Business and the Economy?

Our current energy systems cause three economic risks that climate policies can address:

1. Negative impacts of volatile and rising fossil fuel prices
2. Detrimental impacts of climate change due to current and unavoidable GHG concentrations
3. Negative impacts from future emissions

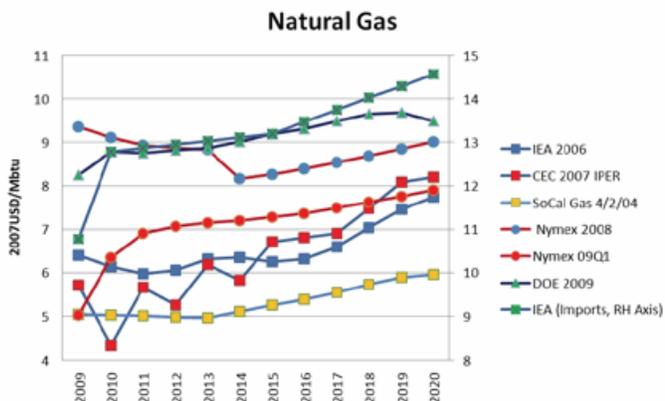
The most immediate risks are the rising costs of fossil fuels and the negative impacts that they have on the economy. Official government estimates show a wide range of possible future prices and a history of high volatility. To the degree that a growing portion of our energy supply comes from sources that are not based on fossil fuels, we have an opportunity to protect ourselves. In addition, money spent on fossil fuel generation does not produce as many jobs as equivalent energy coming from renewables generation.

Reducing energy expenditures by improving energy efficiency gives more discretionary expenditure to households. Research done at the University of California<sup>7</sup> demonstrates that discretionary spending produces 50 times more jobs than spending the equivalent expenditure on fossil fuel energy. The reason is that fossil fuel costs are mostly the cost of the fuel itself – they have a very small labor component.

On the other hand, non-fossil fuel energy at the same price as fossil fuel has a larger labor and capital component. We are trading off fuel costs for capital and labor. Since the capital and labor investments are spent locally, they produce a more positive economic benefit than fossil fuels that tend to come from much further away.

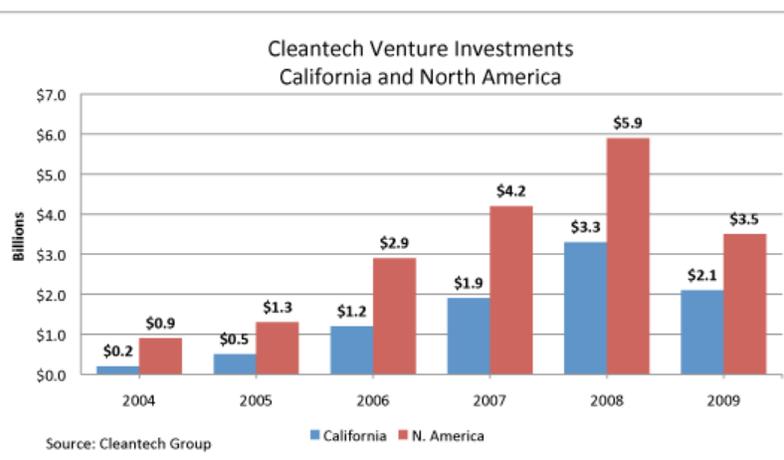
New energy systems offer the benefit of creating whole new industries with global potential. Just as the semiconductor, software and biotechnology industries started and grew in California, the “cleantech” industries have the potential to exceed the size of prior industries. An early indicator is the growth of cleantech venture capital in California and in the nation overall. For the last two years, cleantech has been the largest investment category for venture capital and California has secured close to 60 percent of the total invested in the U.S. The first quarter of 2010 continued this trend with total North American investment growing to \$1.5 billion and California receiving \$870 million, or 60 percent, of the total.

**Figure 2.** Various forecasted natural gas prices



*Forecasts of future natural gas prices vary widely. Climate policy can reduce California's dependence on natural gas by encouraging the growth of cost-effective alternatives.*

**Figure 3.** Cleantech venture investments – California vs. North America



*Venture investments in cleantech from 2004 through 2009 show strong growth and California's market share expanding from 22 to 60 percent.*

Historically, every \$100 million in venture investment has resulted in 2,700 long-term direct jobs once the companies mature.<sup>8</sup> Based on that estimate, the \$9B in venture investments through 2009 in California cleantech companies will result in over 230,000 direct jobs.

In summary, the first five measures create a guaranteed market for clean energy solutions that encourages investment and innovation. The sixth measure, cap-and-trade, guarantees the reduction in greenhouse gas emissions from existing sources. Through the cap, companies have a financial incentive to either reduce or capture and sequester greenhouse gas emissions. The addition of a price on carbon emissions also creates an added incentive for investment in and deployment of clean energy solutions.

### **What are the potential negatives for business?**

Climate policy does not come risk-free. There are three major negatives that need to be managed:

1. A limit on carbon increases costs for fossil energy sources.
2. Capital is diverted to energy investments that might otherwise have been used to expand revenues/profits.
3. Change is hard.

Of the six major climate policies under AB 32, only the cap on emissions imposes a potentially significant new cost on fossil fuels that needs to be overcome by both reducing demand through efficiency and through the creation of non-fossil fuel energy sources that can compete on price with fossil fuels. For example, in order to reduce greenhouse gas emissions enough to meet the cap, the price for a ton of CO<sub>2</sub> emissions is expected to be between \$10 and \$25 per ton. Such a price on carbon would translate to the following additional costs:

- Gasoline/Diesel: 10 to 25 cents per gallon. Using the current average cost of \$3.09/gallon this would represent an increase of 3.2 to 8.1 percent.
- Electricity: 0.37 to 0.92 cents per kilowatt-hour. Using the current average cost of 13.2 cents per kilowatt-hour, this would represent an increase of 2.8 to 7.0 percent.<sup>9</sup>

Modest improvements in efficiency would be needed to neutralize these increases and result in no net increase in energy bills. In addition, California policies could include a program to refund monies collected from a price on carbon back to households and/or business to offset the impacts on those most affected and least able to deal with cost increases.<sup>10</sup>

### **Why do economic models differ so greatly?**

Many economic modeling efforts have been used to try to forecast the net benefit of AB 32. The studies use a variety of modeling techniques and their results differ because of the assumptions they make:

1. Do they include the benefits, or only the costs?
2. What do they assume for a price on carbon?
3. What is assumed for the price of fossil fuels and alternative fuels in 2020?
4. They vary in treatment of substitution by producers and consumers in response to price changes.
5. Some of them rule out the possibility for regulation to induce technological innovation, such as what actually happened in California over the past 35 years.
6. Some of them ignore the revenue from the price on carbon – they assume that it will somehow vanish from the California economy.
7. None of the studies allow for any benefits, or positive externalities, from reducing GHG emissions, whether local environmental benefits from improved air quality, or global benefits.

8. None of the studies acknowledge or deal with market failures in the energy economy (e.g. monopolies and lack of competition).

As an example, a Next 10 authored by UC Berkeley professor David Roland-Holst,<sup>11</sup> used Department of Energy fuel forecasts and California Energy Commission forecasts for renewables. It found that under a business-as-usual situation, electricity costs per capita for California would rise from \$681 per capita today to \$779 per capita in 2020. The higher energy costs come with no net benefits and result in a decrease in gross state product and jobs, as shown in the figure at the beginning of this article. Using the AB 32 programs of renewables and efficiency improvements resulted in a 2020 electricity cost of \$604 per capita and the corresponding benefit of a net increase in gross state product and jobs.

Improved economics comes from (1) renewable energy becoming more cost effective while fossil fuels get more expensive, (2) avoided energy costs producing more jobs, and (3) an expanding work force.

On the other hand, if one assumes that the only economic effect of AB 32 is a price on carbon resulting in higher costs with no benefit from efficiency, and no innovation that will result in alternative and renewable energy and stable fossil fuel prices, then it is very easy to see how one comes up with a negative economic result. This ignores, of course, the detrimental economic consequences of climate change that result from *not* addressing the issue.

### What's next?

During 2010, CARB will finish the design of the cap-and-trade program, including the cap for each year from 2012 to 2020. The rate at which the cap cuts emissions will determine the price of carbon.

Investments in energy systems are measured in very long time frames. Heating and cooling systems for buildings last 20 years or more. Power plants have 40- to 60-year lifetimes. Thus climate and energy policies need to have a long-term, predictable time frame so that large investments can be made intelligently. **Climate policy cannot be started and stopped without major disruptions to private sector investments.**

In its first four years, the economy has reacted positively to AB 32. Because the cap does not begin until 2012, there have been **no new costs to the economy at large**. Also, the plan for 2012 is likely to set the cap at business-as-usual levels (after accounting for other policies and voluntary reductions), another buffer against higher costs at the outset of the program. Anticipation of demand for clean energy and energy efficiency has driven growth in the cleantech industries in California. Recent legislation providing new ways to finance energy retrofits in residential and commercial buildings<sup>12</sup> has started new businesses in energy efficiency. According to the California Employment Development Department, 300,000 workers throughout California are already involved in producing green products or providing green services.<sup>13</sup>

California voters will be facing a November 2010 ballot measure calling for, effectively, the permanent suspension of AB 32.<sup>14</sup> If the measure passes, California will lose the momentum and benefits achieved from the first four years of implementation. Investment decisions will be stalled as the market loses clarity as to whether to invest in the status quo or in low-carbon solutions.

The key for California is to (1) maintain the current programs and the jobs and innovation they are creating, and (2) design the cap in a way that considers the economic forecasts for 2012-2020. The economic slowdown has already resulted in lower-than-expected emissions in 2009 and 2010.

By starting the cap slowly, we can keep the price of carbon low initially, while discouraging carbon intensive investments, and promoting low carbon solutions.

Any delay is certain to increase costs and significantly discourage existing investors. Reducing greenhouse gases will be more expensive in the future than it is today because we would have to reduce them faster and we will have wasted money in carbon-intensive investments. Acting now is more likely to

limit further environmental degradation, lower the cost of mitigation and spur innovation in clean energy technologies.

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- <sup>4</sup> Please see: <http://www.e2.org/jsp/controller?docName=campaignDisplay&activityName=CalifCleanCars1493>
- <sup>5</sup> Roland-Holst, 2009.
- <sup>6</sup> California Air Resources Board. 2010. "Updated Economic Analysis of California's Climate Change Scoping Plan." Staff report. Available online: [http://www.arb.ca.gov/cc/scopingplan/economics-sp/updated-analysis/updated\\_sp\\_analysis.pdf](http://www.arb.ca.gov/cc/scopingplan/economics-sp/updated-analysis/updated_sp_analysis.pdf)
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- <sup>10</sup> California Economic and Allocation Advisory Committee. 2010. "Allocating Emissions Allowances Under a California Cap-and-Trade Program." Recommendations to the California Air Resources Board and California Environmental Protection Agency. Available online: [http://www.climatechange.ca.gov/eaac/documents/eaac\\_reports/2010-03-22\\_EAAC\\_Allocation\\_Report\\_Final.pdf](http://www.climatechange.ca.gov/eaac/documents/eaac_reports/2010-03-22_EAAC_Allocation_Report_Final.pdf)
- <sup>11</sup> Roland-Holst, 2009.
- <sup>12</sup> Please see: <http://www.pacenow.org/>
- <sup>13</sup> California Employment Development Department. 2010. "State Survey Identifies Over 300,000 Jobs in California With Major Emphasis on Green Practices." News release. Available online: [http://www.edd.cahwnet.gov/About\\_EDD/pdf/nwsrel10-10.pdf](http://www.edd.cahwnet.gov/About_EDD/pdf/nwsrel10-10.pdf)
- <sup>14</sup> Please see "Defending AB 32 and Stopping the Dirty Energy Proposition," an April 2010 E2 newsletter article, for a description of the initiative and E2's response: <http://www.e2.org/jsp/controller?docId=22119&anchorName=AdamStern-AB32defense>