



## The Economic Case for California's Landmark Climate and Clean Energy Laws AB 32 (2006), SB 350 (2015) and SB 32 (2016)

### Smart energy policies spark economic growth & job creation in California

- California has reduced its GHG emissions by approximately 10 percent since peak levels in the early 2000s, while continuing to **grow its economy at a rate above the national average**.<sup>i</sup> The state is well on its way to meet the AB 32 GHG reduction target of below 1990 levels by 2020.
- With 1 in every 6 advanced energy workers nationwide, **California has the largest advanced energy industry by employment of any state** in the country. Employment in the state's **advanced energy industry grew 18 percent in 2015**, six times the rate of statewide employment growth. **More than 500,000 California workers spend some or all of their time on advanced energy work**, including energy efficiency, advanced electricity generation, biofuels, advanced grid technology, and advanced vehicles.<sup>ii</sup>
- In the energy efficiency sector specifically, **California has the largest workforce in the nation, with more than 320,000 workers**, who spend about 50 percent of their time on energy efficiency services.<sup>iii</sup>
- SB 350's increase of the Renewable Portfolio Standard (RPS) to 50 percent by 2030 will create an estimated additional **354,000-429,000 direct job years and a total of 879,000-1,067,000 total job years** from the construction of new renewable generation.<sup>iv</sup>
- In addition to the **RPS creating about 53 million hours of blue-collar and 15 million hours of white-collar construction work** from 2002 to 2015, the quality of the jobs has been high - supporting skilled workers with family-sustaining compensation and benefits.<sup>v</sup>
- In the San Joaquin Valley alone, home to many of California's more rural communities where unemployment has remained higher than other areas of the state, construction on **RPS-related projects created 88,000 total jobs** and resulted in a **total economic impact of \$11.6 billion**.<sup>vi</sup>
- California **generates the most manufacturing output, jobs and exports of any state** in the United States.<sup>vii</sup>
- California's 35-plus year history with energy efficiency shows that **50 new jobs were created** across the state's diverse economy **for every job forgone in the oil, gas and electric power sector**.<sup>viii</sup>
- Analysis from University of California researchers estimates that AB 32 policies could **increase household incomes by \$48 billion and create about 400,000 jobs**.<sup>ix</sup>
- California **can reduce greenhouse gas emissions while growing the economy**; we have been doing it for the last 35 years. Innovative energy policies over the past three decades have **saved Californians \$56 billion on household energy costs** and allowed them to reduce expenditures on imported fossil fuels and redirect spending to **create 1.5 million full-time jobs**.<sup>x</sup>
- The **transition toward a cleaner economy is well underway throughout the West Coast region** with a Gross Domestic Product (GDP) contribution of \$47 billion and 508,400 full-time equivalent clean jobs in 2010. It is estimated that **up to 1.03 million net new jobs can be created between 2010 and 2020 for the West Coast**. GDP contributions of up to US \$142.7 billion and increased investments of between \$147-192 billion are also possible during this period.<sup>xi</sup>
- California's **Low Carbon Fuel Standard (LCFS)**, a key component of AB 32, **could create as many as 9,100 new jobs for California**. This number could be higher, particularly if the state attracts more clean fuel production facilities and technology providers.<sup>xii</sup>
- In the San Joaquin Valley, the total economic benefit of programs created by California's clean energy policies is **more than \$13.4 billion** so far.<sup>xiii</sup>

## California consumers & businesses save billions due to energy efficiency

- In 2016, **California led the nation in energy efficiency**, due in part to AB 32 and SB 350.<sup>xiv</sup>
- The state's commitment to energy efficiency **has saved consumers billions of dollars**; in fact, residents' monthly electricity bills have increased only \$4.25 on average in the last 25 years.<sup>xv</sup>
- The recent improvements made to California's Energy Savings Assistance Program (ESAP) to help more low-income multi-family residents will reduce energy waste to help lower electricity bills.<sup>xvi</sup> On average, **each residence saves about \$50 each year on energy bills under the ESAP.**<sup>xvii</sup>
- California's new energy efficiency standards for computers and monitors **will save consumers approximately \$373 million annually** and save enough energy to power about 350,000 homes each year.<sup>xviii</sup>
- Simple energy efficiency improvements to existing buildings yield **\$3 in savings on average for every \$1 invested.**<sup>xix</sup>
- **Manufacturers generate \$59 in state GDP for every dollar spent on electricity**, compared to \$38 for the rest of the nation.<sup>xx</sup>
- Seventy percent of energy efficiency businesses in California are **small businesses.**<sup>xxi</sup>
- AB 32 enables Californians to spend less to heat and cool their homes because energy efficiency measures will allow households and businesses to use less energy. Californian homeowners are expected to **save \$200 a year on electricity** due to AB 32.<sup>xxii</sup>
- **Consumers directly benefit from California's efficiency policies.** While California's average electricity rates per kilowatt-hour are higher than the U.S. and other large states, average monthly residential bills in California were twenty percent lower than the U.S. average in 2014.<sup>xxiii</sup>

## California's climate and clean energy programs are driving billions of investment dollars into the state

- In 2015, California again led the country in attracting more clean tech investment than any other state - **\$9.8 billion – an increase of 35 percent from the previous year.** Of the total clean technology investment in the country, 68 percent of investments were made in California.<sup>xxiv</sup>
- At \$40.6 million, **Silicon Valley ranked 1<sup>st</sup> in clean tech funding in the U.S.** in the first quarter of 2015.<sup>xxv</sup>
- Policies like AB 32, SB 32 and the RPS are **driving demand for renewable energy and energy efficiency**, and as a result, **corporate investors have shifted their emphasis.**<sup>xxvi</sup>
- The LCFS is **driving investment in low carbon biodiesel, ethanol, renewable diesel, biogas, and electricity.**<sup>xxvii</sup>

## AB 32, SB 32 and the LCFS will lessen California's dependence on oil

- In the first eight years of AB 32, **California's petroleum consumption decreased more than 14 percent.**<sup>xxviii</sup>
- AB 32 has spurred complementary clean transportation policies in California, **which will help households save between \$1,210-1,530 annually in fuel costs** by 2030.<sup>xxix</sup>
- Reduced demand for imported fuels through a suite of AB 32 policies will shield Californians from the price volatility of these fuels. A first-of-its-kind study found significant savings if an oil price shock occurred in 2020, with California **consumers and businesses saving between \$2.4 and \$5.2 billion, and the average household saving up to \$362.**<sup>xxx</sup>
- The LCFS is likely to **lower the average price of transportation fuels and bring greater stability to fuel prices** in response to fluctuating crude oil prices, as the number of competitors selling in the wholesale fuel market increases as well as the diversity of fuel types.<sup>xxxi</sup>
- By mid-2016, the LCFS had helped **displace 5.3 billion gallons of gasoline and 1.2 billion gallons of diesel fuel.**<sup>xxxii</sup>
- In 2014, **the state received more than 20 percent of its total electricity from renewable sources**, compared to 6.8 percent for the U.S.<sup>xxxiii</sup>

## California's climate and clean energy policies will help stabilize the state's economic future

- The most expensive way to respond to climate change is to ignore it. Californians are already feeling climate change impacts, and if left unchecked **climate change could cost California as much as \$47 billion every year in direct damages** and put at risk trillions of dollars of real estate, infrastructure, and other assets.<sup>xxxiv</sup> Unrestrained greenhouse gas pollution also threatens water resources and important industries like tourism, entertainment, agriculture, and recreation that fuel the state's economic engine.
- In 2030, the **estimated climate benefits (the avoided economic damages) of California's climate measures will be between \$2.4 and \$11 billion.**<sup>xxxv</sup>
- By spurring greater use of clean alternative fuels and vehicles, the **LCFS will result in \$1.4-\$4.8 billion in societal benefits by 2020 from reduced air pollution and increased energy security.**<sup>xxxvi</sup>

<sup>i</sup> "The 2017 Climate Change Scoping Plan Update," California Air Resources Board, January 2017.

[https://www.arb.ca.gov/cc/scopingplan/2030sp\\_pp\\_fin.pdf](https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_fin.pdf)

<sup>ii</sup> "Advanced Energy Jobs in California 2016," Advanced Energy Economy, April 2016.

<https://www.aee.net/articles/new-survey-california-s-advanced-energy-industry-up-18-percent-from-last-year>

<sup>iii</sup> "Energy Efficiency Jobs in America," Environmental Entrepreneurs and E4TheFuture, December 2016.

[http://www.e2.org/wp-content/uploads/2016/12/EnergyEfficiencyJobsInAmerica\\_FINAL.pdf](http://www.e2.org/wp-content/uploads/2016/12/EnergyEfficiencyJobsInAmerica_FINAL.pdf)

<sup>iv</sup> "Job Impacts of California's Existing and Proposed Renewables Portfolio Standard," UC Berkeley Labor Center, August 28, 2015.

<http://laborcenter.berkeley.edu/pdf/2015/job-impacts-ca-rps.pdf>

<sup>v</sup> "The Link Between Good Jobs and a Low Carbon Future," UC Berkeley Labor Center, July 2016.

<http://laborcenter.berkeley.edu/pdf/2016/Link-Between-Good-Jobs-and-a-Low-Carbon-Future.pdf>

<sup>vi</sup> "The Economic Impacts of California's Major Climate Programs on the San Joaquin Valley," Next 10, January 19, 2017.

<http://www.next10.org/sites/next10.org/files/econ-impacts-climate-programs-san-joaquin-valley-final.pdf>

<sup>vii</sup> "California's Manufacturing and Benefits of Energy Efficiency," Next 10, Sept. 2015.

<http://next10.org/2015manu>

<sup>viii</sup> Ibid.

<sup>ix</sup> Ibid.; see also David Roland-Holst, UC Berkeley, "Climate Action for Sustained Growth: Analysis of ARB's Scoping Plan," April 19, 2010.

<http://www.arb.ca.gov/cc/scopingplan/economics-sp/meetings/042110/rolandholst.pdf>

<sup>x</sup> David Roland-Holst, UC Berkeley, "Energy Efficiency, Innovation and Job Creation in California," Next 10, October 2008.

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<sup>xi</sup> "The West Coast Clean Economy: Opportunities for Investment & Accelerated Job Creation," The Pacific Coast Collaborative, March 2012.

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<sup>xii</sup> "California's Low Carbon Fuel Standard: Compliance Outlook & Economic Impacts," CalETC, April 2014.

<http://www.caletc.com/wp-content/uploads/2014/04/ICF-Report-Final-2.pdf>

<sup>xiii</sup> "The Economic Impacts of California's Major Climate Programs on the San Joaquin Valley," Next 10, January 19, 2017.

<http://www.next10.org/sites/next10.org/files/econ-impacts-climate-programs-san-joaquin-valley-final.pdf>

<sup>xiv</sup> "The 2016 State Energy Efficiency Scorecard," American Council for an Energy-Efficient Economy, September 26, 2016.

<http://aceee.org/research-report/u1606>

<sup>xv</sup> "Energy Efficiency Jobs in America," Environmental Entrepreneurs and E4TheFuture, December 2016.

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<sup>xvi</sup> "CPUC Adopts Major Improvements to Low Income Efficiency Program," Natural Resources Defense Council, November 10, 2016.

<https://www.nrdc.org/experts/maria-stamas/cpuc-adopts-major-improvements-low-income-efficiency-program>

<sup>xvii</sup> "Energy Savings Assistance Program" Fact Sheet, California Public Utilities Commission.

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<sup>xviii</sup> "Energy Commission Adopts Energy Standards for Computers and Monitors," California Energy Commission, December 14, 2016.

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<sup>xix</sup> "Untapped Potential of Commercial Buildings: Energy Use and Emissions," Next 10 and Collaborative Economics, July 2010.

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<sup>xx</sup> "California's Manufacturing and Benefits of Energy Efficiency," Next 10, Sept. 2015

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<sup>xxi</sup> "The 2017 Climate Change Scoping Plan Update," California Air Resources Board, January 2017.

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<sup>xxii</sup> "AB 32 Climate Change Scoping Plan Document," California Air Resources Board, December 2008.

<http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>

<sup>xxiii</sup> "California Green Innovation Index, 8th<sup>th</sup> Edition," Next 10, June 2016.

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<sup>xxiv</sup> Ibid.

<sup>xxv</sup> PwC Cleantech MoneyTree Report: Q1 2015." PwC, May 2015.

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<sup>xxxvi</sup> “Cleantech Investment: A Decade of California’s Evolving Portfolio,” Next 10, September 2013.

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<sup>xxxvii</sup> “California’s Low Carbon Fuel Standard: Compliance Outlook for 2020,” ICF, June 2013.

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<sup>xxxviii</sup> “Ten Years After: Looking Back on California’s Global Warming Solutions Act (AB 32),” Union of Concerned Scientists, August 3, 2016.

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<sup>xxxix</sup> “Consumer Impacts of California’s Low-Carbon Transportation Policies,” Consumers Union, March 2016.

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<sup>xxxiii</sup> “California’s Low Carbon Fuel Standard Compliance Rate is 98 Percent,” California Air Resources Board, May 17, 2016.

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<sup>xxxiiii</sup> “California Green Innovation Index, 8th<sup>th</sup> Edition,” Next 10, June 2016.

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<sup>xxxv</sup> David Roland-Holst and Fredrich Kahrl, UC Berkeley, “California Climate Risk and Response,” Next 10, November 2008.

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<sup>xxxvi</sup> “The 2017 Climate Change Scoping Plan Update,” California Air Resources Board, January 2017.

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<sup>xxxvii</sup> “California’s Low Carbon Fuel Standard: Compliance Outlook & Economic Impacts,” CalETC, April 2014

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