SMALL BUSINESS MAJORITY

Economic Opportunities for Small Business Under AB 32

October 18, 2010

Economic Opportunities for Small Business Under AB 32

In 2006, California enacted the Global Warming Solutions Act, commonly referred to as AB 32. This was a watershed moment for California's environmental future. AB 32 called for an ambitious reduction in California's carbon footprint. By 2020, it requires the state to cut emissions by 30%—down to 1990 levels—and by 2050, emissions will have to be at 80% of those levels. To do this, AB 32 directed the California Air Resources Board (CARB) to outline cost-effective strategies the state can use to meet those requirements. By the start of 2011, the reduction measures set forth in the plan are to be adopted, making California the national leader in the fight to offset the effects of climate change.

While spearheading environmental policy is not new to California, the controversy that accompanies policy change has been heightened by the recession. Opponents of AB 32 claim that setting carbon reduction measures and regulations will weaken an already struggling economy and cost the state jobs, while proponents argue that the legislation presents an opportunity for California to participate in a clean energy revolution that will create jobs and stimulate new investments.

Much of the discussion surrounding AB 32 has focused on complex cost-benefit estimates and whether the legislation will result in job loss or gain for the state overall.[1] This report, however, looks under the hood of these net benefit discussions to examine, specifically, the economic opportunities that AB 32 presents for small businesses in California.[2] The opportunities include:

- Increased demand for energy efficiency goods and services;
- Enhanced consumer awareness of and interest in "green" products and services;
- More resources in the hands of consumers as a result of lower overall spending on energy;
- Increased investment in clean energy production and other technologies.

California's Small Businesses

Small businesses play a vital role in the state's economy; 7.2 million Californians were employed by 718,220 small businesses (companies with 500 employees or fewer) in 2006. Of these firms, 88% had fewer than 20 employees and nearly half (47%) had between 1 and 4 employees.[3] According to analysis by The Brattle Group, 9 industries account for almost 82% of small businesses.[4] Table 1, below, details the number of small firms and their share of small business employment by sector, including descriptions of the types of businesses in each category.

Table 1: Small Business Characteristics

Industry	% of Firms	% of Employees	Example Businesses
Professional, Scientific, and Technical Services	14.4%	9.5%	Lawyers, accountants, architects, consultants, veterinarians
Health Care and Social Assistance	11.2%	10.7%	Childcare, physicians, dentists, home health care, nursing care facilities
Construction	10.6%	11.0%	Building construction, home additions, maintenance, repairs
Retail Trade	10.5%	9.6%	Office supply, computer, plumbing and electrical supply stores
Other Services (except Public Administration)	8.8%	6.5%	Auto repair, social services, dry cleaners
Accommodation and Food Services	7.7%	11.2%	Restaurants, food carts, bars, hotels, RV parks
Wholesale Trade	7.1%	7.5%	Sellers of clothing, building materials, electronics to other businesses
Real Estate and Rental and Leasing	5.8%	< 5%	Costume rental, car rental, video stores, real estate agents
Manufacturing	5.6%	11.1%	Small manufacturers
All Other	18.4%	≈ 17%	Publishers, insurance agents

Source: The Brattle Group

It is also useful to note that small business accounts for a smaller share of overall state employment in energy-intensive sectors. These include: utilities (24%), information (34%), agriculture (38%), mining (39%), non-energy intensive manufacturing (40 %), and energy-intensive manufacturing (43%).[5] Meanwhile, small business accounts for a majority of employment in labor-intensive and service-oriented sectors, such as construction (73%), wholesale trade (70%), retail trade and finance (65%), insurance and real estate (66%).

In summary, the variety of small business establishments in California means that different firms will find different opportunities from AB 32. The remaining sections of this report discuss these economic opportunities in detail.

Opportunities from Increased Investment in Energy Efficiency

AB 32 will stimulate demand for and increase investment in energy-efficient goods and services, thereby creating opportunities for small businesses that provide them.

AB 32 requires that the state significantly reduce its emissions. Small businesses provide many of the goods and services that consumers and businesses will need to achieve improved efficiency, and therefore stand to benefit. Achieving the energy efficiency milestones AB 32 sets will require a significant investment across many sectors of the economy, including zero-net energy systems for new buildings, whole-building retrofits for existing buildings, and increased use of solar roofs and water heating systems. Inside these buildings, new clean-tech appliances will also lead to improved efficiency.

As Zabin and Buffa, two researchers at the UC Berkeley Center for Labor Research and Education, write in their analysis:

SMALL BUSINESS OPPORTUNITY

Selim Sandoval founded *Growing Green Energy,* a renewable energy installation and green worforce development company in Mammoth Lakes that helps other companies increase their energy efficiency. *Read about his company in the addendum.*

> AB 32 will induce billions of dollars in private and public investment in energy efficiency retrofits, new construction, and renewable energy generation, presenting growth opportunities in traditional sectors and in new markets yet to be developed.[6]

For example, just one of the energy efficiency measures in AB 32—a requirement that new buildings have zero-net energy systems—will stimulate significant growth in California's solar water heating manufacturing and installation sectors. The state has developed a program—the Solar Hot Water and Efficiency Act of 2007 (SHWEA)—to create a self-sustaining industry by authorizing a 10-year, $250 million incentive program for solar water heaters, with the goal of installing 200,000 of these systems in California by 2017.[7] Incentives like these present opportunities for small businesses to tap new markets.

Another AB 32 focus, whole-building retrofits, presents further opportunities for small businesses. Incentives for whole-building retrofits will stimulate growth of the home performance industry, which provides a comprehensive whole-house approach to identifying and fixing energy efficiency problems. According to Efficiency First, the national trade association for home performance contractors, the industry is primarily composed of small businesses.[8] Home performance contractors mostly come from the ranks of the established home construction, remodeling, weatherization, HVAC, and insulation industries—sectors traditionally dominated by small firms. Furthermore, the Center for American Progress estimates that 90% of contractors in the construction industry, 82% of window manufacturers and installers, 90% of HVAC equipment manufacturers and installers, and 90% of lighting equipment manufacturers and installers nationwide are small businesses.[9] In California, the third largest small business sector is construction—compromising 10.6% of all small businesses.[10] Therefore, as AB 32 spurs building retrofit demands, small businesses in construction and related industries will have more business opportunities.

Similar opportunities will accrue to small businesses that manufacture, distribute, sell, and install other efficiency products, such as solar panels, combined heat and power generation systems[11] and consumer appliances. Small firms that specialize in efficiency design and consulting will also experience opportunities for growth and expansion, from architects to green designers.

Efficiency Investments Create More Jobs

According to several studies, energy efficiency investments also create more jobs than comparable purchases of traditionally-generated energy. Traditional energy purchases, such as electricity or natural gas, don't create a significant number of jobs; the jobs they create include capital-intensive refining, conveyance and electric power generation.[12] On the other hand, energy efficiency-related jobs, such as building renovations and appliance manufacturing, tend to be associated with high-tech manufacturing and high-skilled service professions.[13] That's why an analysis by the American Council for an Energy-Efficient Economy found that efficiency-related jobs employed more than twice as many people per dollar of output when compared with the employment effects of spending on traditional energy production.[14] Another study found that 8 to 11 direct jobs are created per $1 million invested in retrofitting buildings for energy efficiency.[15]

In summary, the increased investment in energy efficiency spurred by AB 32 will be an opportunity for small businesses to meet increased demand for building materials, energy and design consultations, energy-efficient appliances and electronics, and residential and commercial renovations. AB 32 will also increase demand in traditional small business strongholds such as the construction, manufacturing, retail, wholesale trade and professional services sectors.

Opportunities from Going Green

AB 32 will create savings and profit opportunities for "new Main Street" small businesses that successfully "go green" and employ brand differentiation strategies to grow their businesses.

AB 32 doesn't require businesses to "go green," but provides financial incentives for those that do. While AB 32 does not require small businesses to invest in energy efficiency improvements, it can provide opportunities for entrepreneurs that decide to make their businesses more sustainable. First, making investments in more efficient technologies will save businesses money on energy costs. And it will be easier than ever for small businesses to take advantage of these technologies thanks to the substantial resources devoted to helping them make improvements. Second, increased consumer awareness of climate change spawned by the law likely will lead to increased demand for climate-conscious products and services—simultaneously creating opportunities for companies that successfully promote the "greener" aspects of their businesses.

SMALL BUSINESS OPPORTUNITY

San Diego-based printer **Thomas Ackerman**, owner of *Spirit Graphics and Printing, Inc.*, employed a number of sustainable practices to make his business "greener." *Read about his company in the addendum.*

It's Easy Going Green

CARB has focused its AB 32 implementation efforts on helping small businesses invest in better energy efficiency processes and products. It has created information campaigns and resources that present small businesses with numerous no-cost and low-cost ways in which to save money by cutting energy use. For example, small investments such as occupancy light sensors or larger investments in new Energy Star equipment or appliances will lead to reductions in the amount of energy used for lighting, refrigeration, heating and air conditioning, and computers and other equipment—thereby reducing energy purchases. Savings resulting from these investments will directly affect small businesses' bottom lines and can be reinvested to grow their businesses. Additional subsidies will be available for small businesses implementing efficiency measures, lowering the cost of going green.[16,17]

How AB 32 Will Increase Consumer Demand for "Green" Products and Services

As AB 32 implementation proceeds, consumers will likely become more aware of climate change. Heightened consumer awareness will increase demand for "green" products and services. According to a report by researcher Andrea Reyell and her co-authors, firms respond with "increasing environmental proactiveness" based on the extent of media and policy attention "on issues such as climate change, which has heightened public concern and galvanized support for urgent environmental action."[18] A study commissioned by Green Seal and EnviroMedia Social Marketing shows that sustainability is a high priority for consumers—with 82% still buying green products despite the down economy. Valerie Davis, EnviroMedia's CEO said, "There's a real opportunity for authentic green marketing, despite the tough economy. This research proves people want to do what's best for the environment…"[19]

Not only does research support the idea that increased awareness of climate change issues will spur consumer demand for green products, many consumers are in fact willing to pay a premium for products that they consider to be more environmentally friendly. According to a report by the Boston Consulting Group (BCG), "Consumers were willing to pay a higher price for green products deemed to be of higher quality."[20] The report further found that "the continuing expansion of green consciousness around the world presents a huge opportunity for smart companies." According to the survey that formed the basis of the BCG report, "most consumers…consider a store's green credentials when choosing where to shop—a clear opportunity for savvy retailers."

Other Benefits of Brand Differentiation

Successfully "going green" can help small businesses become more competitive in the market, but more important for many small businesses, recruit and retain talented employees. Not only can successful brand differentiation lead to increased sales and customer loyalty, evidence suggests that other aspects of a business can benefit, as well. According to one study, "business owners were motivated not just by the 'push' of legislation and environmental concern but by the 'pull' of potential cost savings, new customers, higher staff retention and good publicity for their firms."[21] Among these factors, it is perhaps the ability to recruit and retain talented employees that has the biggest impact. In an interview about the business case for sustainability, SAP chief sustainability officer Peter Graf said, "sustainability really re-energizes our workforce. We needed something where people say, 'Yeah, I'm proud to work for SAP. We have a huge impact. This is a great opportunity.' People need to come to work for a purpose that's bigger than selling software."[22] What's more, a group of 2009 MBA graduates from Harvard Business School created an ethical pledge that, among other things, "strives to create sustainable economic, social and environmental prosperity worldwide," as a way to enhance the value their businesses create for society over the long term.[23]

In summary, evidence suggests that small businesses have an opportunity to save money through greening their operations, and to grow and improve their businesses through successful "green" rebranding. As the BCG report concludes, "our research proves that green matters to consumers around the world, and green strategies offer companies and retailers a competitive advantage in product differentiation and cost savings."[24] As AB 32 implementation proceeds, we should expect consumer awareness of and demand for green products and services to increase, with corresponding benefits for small businesses.

Opportunities from Reduced Spending on Energy Purchases

AB 32 will benefit small businesses by lowering overall energy costs, which can lead to increased spending on other goods and services.

The energy efficiency investments put in place by AB 32 will result in increased energy efficiency and decreased household energy consumption. This means consumers will spend less money on gasoline, electricity and other forms of energy. In effect, money that consumers were spending on gas and electricity will be available to be used on other goods and services, which will lead to increased demand and production in these sectors. Overall, taking into account the recent economic downturn, CARB conservatively projects that AB 32 will save $2 billion in personal income.[25]

SMALL BUSINESS OPPORTUNITY

Husband and wife team **Kim and Monique Kelso**, owners of *Toot Sweets Bakery & Café* in Stockton, were able to give their bottom line a hefty boost by significantly reducing their energy costs.

Read about their company in the addendum.

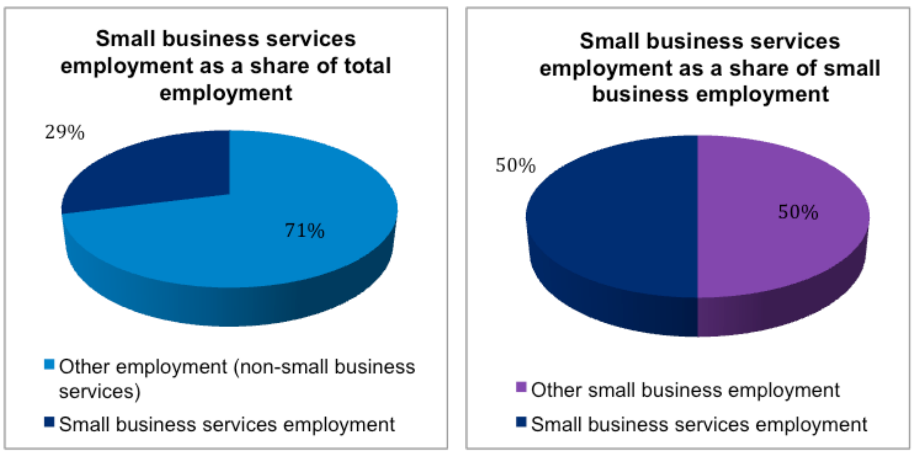
Energy efficiency savings have an additional benefit beyond the amount of money shifted from energy purchases to purchases of other goods and services. Traditional energy production supply chains do not create a significant number of jobs (relying instead on capital equipment), and for California they mainly include capital-intensive refining, conveyance and electric power generation. On the other hand, non-energy consumer spending is concentrated in job-intensive services, such as retail, consumer goods and foodstuffs.[26] As a result, a shift in consumer spending of this nature results in an increase of jobs. U.C. Berkeley economist David Roland-Holst describes this process:

> When consumers shift one dollar of demand from electricity to groceries, for example, one dollar is removed from a relatively simple, capital intensive supply chain dominated by electric power generation and carbon fuel delivery. When the dollar goes to groceries, it animates much more job intensive expenditure chains including retailers, wholesalers, food processors, transport, and farming. Moreover, a larger proportion of these supply chains (and particularly services that are the dominant part of expenditure) resides within the state, capturing more job creation from Californians for California.

This basic economic relationship explains why Roland-Holst found that, in California between 1972 and 2006, energy efficiency measures created about 1.5 million full-time equivalent jobs with a total payroll of $45 billion. It also explains earlier work by the RAND Corporation, which found that energy efficiency improvements between 1977 and 1995 increased per capita Gross State Product (GSP), a measure of economic output, by at least 3%.[27]

CARB analyzed the economic impact of full implementation of AB 32, and found that the small business service sector in particular will see significant benefits. This sector accounts for nearly 30% of the state's total employment, and 50% of all small business jobs (Chart 1).[28] Under AB 32, this sector will see an increase of $4.6 billion in net income by the year 2020, and more than 15,000 new jobs will be added. These benefits are a result of requirements in the law that spur greater energy and fuel efficiency, which will save small businesses money. CARB's analysis also found that as the California economy was projected to experience continued economic growth associated with the implementation of AB 32, small businesses were expected to experience many of the benefits—more jobs, greater productive activity, and rising personal income—associated with that growth.[29] In fact, the financial benefit of the law translates to an extra $1,115 per employee per year (Table 2).[30]

Chart 1: Small Business Service Sector Employment



Source: Table 31: California Employment and Small Business Share by Industrial Sector, *CARB's Updated Economic Analysis of California's Climate Change Scoping Plan Staff Report to the Air Resources Board*, March 24, 2010

Table 2: Small Business Sector Increased Output and Employment Under AB 32

	Baseline	AB 32	Net increase with full implementation of AB 32
Total output in small business service sector	$556.9 billion	$561.5 billion	$4.6 billion
Total employment in small business service sector	4,117,225	4,132,439	15,214
AB 32 increased economic output per small business service sector employee in 2020	$1,115		

Sources: Table 32: E-DRAM Small-Business Employment Changes for Modeling Cases and Table 33: E-DRAM Small-Business Output Changes for Modeling Cases, *CARB's Updated Economic Analysis of California's Climate Change Scoping Plan Staff Report to the Air Resources Board*, March 24, 2010

As CARB's economic modeling shows, AB 32, by reducing consumers' energy bills, will likely redirect spending away from large energy providers and toward small businesses. Whether these businesses are suppliers to other larger businesses, traditional retailers, or "Main Street" service providers, increased consumer spending on non-energy goods and services has the potential to strengthen California's small business sector.

Opportunities from Innovation

AB 32 will spur investment in and development of technological innovation, creating new economic opportunities for small businesses.

The innovative push of AB 32 may be one of its greatest economic benefits to small businesses and the state economy as a whole. Implementing AB 32 requires reductions in carbon emissions that will only be achievable through the development and implementation of new technologies. While the 2020 goals can be met mostly using existing technologies and improved efficiency, the 2050 targets—which aim to cut emissions to 80% of 1990 levels—will, according to CARB, "require California to develop new technologies that dramatically reduce dependence on fossil fuels, and shift into a landscape of new ideas, clean energy, and green technology."[31] These new technologies will present numerous opportunities for small businesses. The innovators of many of these technologies will be small businesses, which will produce direct profits. They will also profit indirectly through the statewide economic growth that follows increased investment and technological innovation.

SMALL BUSINESS OPPORTUNITY

Chris Erickson founded San Francisco-based *Climate Earth*, a company that sells a software service that measures and tracks greenhouse gas emissions and energy use. *Read about his company in the addendum.*

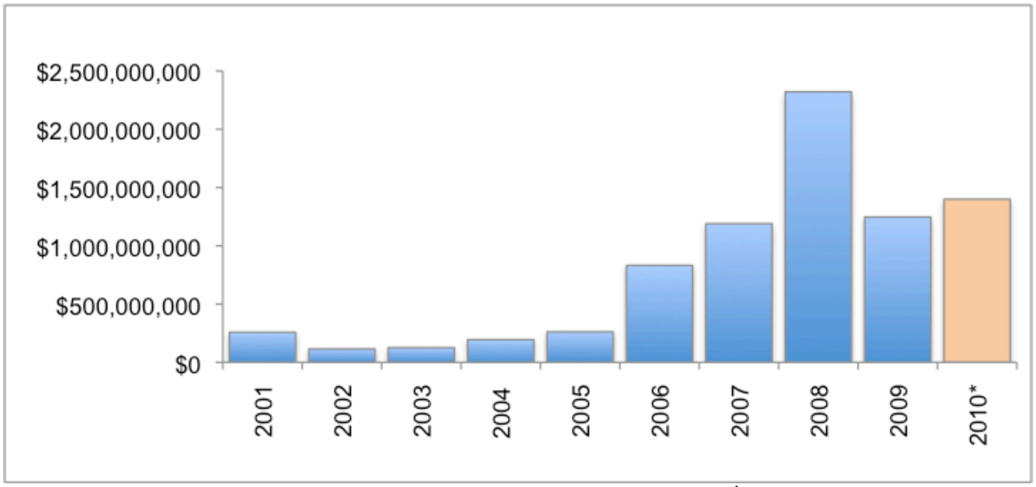
As these new technologies emerge and certain sectors of the economy grow, small businesses will be called upon to supply many of the new products and services. Therefore, they will indirectly benefit from the "trickle-down" effect of innovation. For example, as the clean tech space has grown since 2001, jobs have been created not only in the companies that have been conceived during that time, but also in many ancillary industries (accounting, law, banking, consulting, facilities maintenance, and public relations, to name a few) and even in the public sector.[32]

While CARB forecasts that AB 32 will result in an overall net increase in jobs by 2020, David Roland-Holst projects more significant job growth based on the "trickle-down" nature of innovation. By "including the potential for innovation," Roland-Holst found much more optimistic economic consequences than CARB: Gross State Product (GSP) would jump by about $76 billion, increasing real household incomes by up to $48 billion and creating as many as 400,000 new efficiency and climate action driven jobs.[33]

Innovation can be a significant driver of economic growth, both at the macro-level (states and countries) and at the individual firm level. Since renowned economist Joseph Schumpeter published his definitive work on innovation in 1942, researchers have focused on the causes and benefits of innovation—trying to spur more of it. By all indications, AB 32 has this power. It shapes the market for technological development by providing regulatory guidance, reducing regulatory uncertainty, and creating demand for new products and services.[34,35]

AB 32 has already begun spurring innovation and economic growth. Despite the recession, studies show that AB 32 has resulted in nearly $11.6 billion in investments since 2006. Venture capital, a lead indicator of economic growth in a sector, has been flooding into California since AB 32's passage in 2006. In 2008, CARB measured venture capital investment in the industrial/energy industry as a proxy for green technology investment. According to data supplied by PricewaterhouseCoopers (as shown in Figure 1), venture capital investment has exploded since 2006. Even with the economic downturn, these investments have grown from $262 million in 2005 to $1.4 billion in just the first two quarters of 2010.[36] In the same period, California's share of the nation's total venture capital investment in the industrial/energy industry has risen from 32% in 2005 to 53% in 2009.

Figure 1: Venture Capital Investment in Energy Innovation in California Before and After Passsage of AB 32 in 2006



Source: PricewaterhouseCoopers' MoneyTree Report * Reflects only two quarters of data.

The Cleantech Group, LLC, provides another measure of technology innovation funding. Their clean technology venture capital figures are based on data for a broader range of investments outside of the energy sector, including recycling, waste, agriculture, materials and transportation. In 2010, they reported that California clean technology firms received 60% of total North American venture capital investment in 2008 and 2009, at $3.4 billion and $2.1 billion respectively.[37] Between 2005 and 2009, venture capital investment in clean technology grew 360%. At its peak in 2008, investment was up 623% over 2005.[38] These increased investments fuel innovation and stimulate economic growth. As former U.S. Secretary of State George Shultz noted, since passage of the law, "a whole industry is developing here, and I might say a lot of jobs are connected with it."[39]

How Small Businesses Benefit

Historically, small businesses have been a major source of innovation. According to the U.S. Small Business Administration, small firms are a significant source of innovation and patent activity: They produce more patents per employee than larger businesses; outperform large business patents in growth, citation impact and originality; and tend to specialize in high tech, high-growth industries, such as bio-technology, information technology and semiconductors.[40] Most studies find that small firms can keep up with larger firms in terms of innovation, and show no difference in the quality and significance of the innovation produced.[41] All in all, small businesses are set up well to enter this market demand with new ideas, new products and processes, and compete for venture capital dollars and increased consumer demand.[42]

The process of innovation itself will financially benefit small businesses. Schumpeter's original theory has led to numerous economic studies showing innovation is a source of economic growth. A considerable body of evidence now exists that shows the level of technological innovation contributes significantly to economic performance, particularly at the firm and industry levels.[43] Think, for example, of the new economic activity created by the dot com revolution and the multiplicity of new products and services that resulted: Google was started by two college students, as was Facebook, and countless new eBay entrepreneurs make their fortunes online every day. Then think of all the companies that profit by providing goods and services in these areas. All this firm-level growth then filters throughout the economy as innovators and their customers buy products and services from other businesses, and their employees spend their paychecks on consumer goods.

Clean Technology Production Creates More Jobs

The clean technology sector is spawning tremendous innovation. Clean energy technology will create more jobs than the traditional energy sector, and there is strong evidence that clean energy production can generate more jobs than its fossil fuel-based counterpart.[44,45]

AB 32 can help create significant opportunities for entrepreneurs to introduce new products and services to a growing market, to drive change and spur innovation. Despite the fact that not all small businesses are innovators, the majority of small businesses will benefit from innovation because it stimulates wider economic growth.

Conclusion

AB 32 provides small businesses with numerous economic opportunities for growth and success. Increased investments in energy efficiency products and services will provide new markets for small businesses. Many of these businesses will be in the construction, manufacturing, retail and professional services sectors. More traditional "Main Street" businesses, such as the local dry cleaner and florist shop, can also benefit by going green. Investing in energy efficiency improvements will not only boost their bottom line, but will help them retain qualified employees and attract new customers interested in sustainable products and services. Still another type of small business, the "clean tech" entrepreneur, is set to benefit from increased demand for innovation in clean energy technology. All small businesses stand to benefit as AB 32 creates demand for new products and services that have yet to be designed and whose effects may be more wide-ranging than anticipated.

In the end, the overall economic growth from increased investment and innovation will benefit a wide swath of small businesses across the state. Similarly, almost all small businesses will benefit from decreased consumer spending on traditional energy, and the increased spending on other consumer goods and services. These goods and services are more likely to be produced in California and provide more jobs for Californians than the energy purchases they replace. Almost every small business has something to gain from California's commitment to a more sustainable economy.

Endnotes

1 Although there have been numerous studies on the economic effects of AB 32, the most credible research to date has been completed by the California Air Resources Board. According to this research, the state can expect to experience a small net increase in employment by 2020 as a result of the implementation of AB 32.

2 It should be noted that when we speak of AB 32 throughout this report, we mean California's climate change policies as set out in California's Global Warming Solutions Act of 2006 (AB 32) and the standards and programs that are adopted by California's administrative agencies, including the California Air Resources Board, to implement the AB 32 Scoping Plan. Thus, we consider, for example, the Renewable Portfolio Standard and the Pavley Light-Duty Vehicle Emissions Standards part of "AB 32."

3 United States Small Business Administration Office of Advocacy, "Data By State, Metropolitan Statistical Area (MSA), And County," Firm Size Data, http://www.sba.gov/advo/research/data.html#st:

4 The Brattle Group, The Economic Impact Of AB 32 On California Small Businesses (Union of Concerned Scientists, Dec 2009)

5 California Air Resources Board, Updated Economic Analysis Of California's Climate Change Scoping Plan (Mar 24, 2010)

6 Carol Zabin and Andrea Buffa, Addressing The Employment Impacts Of AB 32, California'S Global Warming Solutions Act (UC Berkeley Center for Labor Research and Education, Feb 2009)

7 Assembly Member Huffman, AB 1470 Solar Water Heating and Efficiency Act Of 2007, 2007.

8 Their 2010 Efficiency First Workforce Survey of 161 companies in 36 states reveal 89% of survey respondents have fewer than 50 employees.

9 Bracken Hendricks and Matt Golden, Taking On The Tool Belt Recession: Energy Efficiency Retrofits Can Provide A Real Help For Construction Unemployment (Center for American Progress, Mar 2010)

10 The Brattle Group, The Economic Impact Of AB 32 On California Small Businesses (Union of Concerned Scientists, Dec 2009)

11 Combined heat and power (CHP) generation systems, often called cogeneration systems, produce electricity and useful thermal energy in an integrated system. Their use displaces the need for new or expanded power plants. MicroCHP and MiniCHP systems serve the needs of entire buildings on-site.

12 David Roland-Holst, Energy Efficiency, Innovation, And Job Creation In California (Center for Energy, Resources, and Economic Sustainability, Oct 2008)

13 Karen Ehrhardt-Martinez and John A. "Skip" Laitner, The Size Of The U.S. Energy Efficiency Market: Generating A More Complete Picture (Washington, D.C., American Council for an Energy-Efficient Economy, May 2008)

14 Ibid.

15 Sarah White and Jason Walsh, Greener Pathways: Jobs And Workforce Development In The Clean Energy Economy (Center on Wisconsin Strategy, The Workforce Alliance, and The Apollo Alliance, 2008)

16 The Brattle Group, The Economic Impact Of AB 32 On California Small Businesses (Union of Concerned Scientists, Dec 2009)

17 California Air Resources Board, Updated Economic Analysis Of California's Climate Change Scoping Plan (Mar 24, 2010)

18 Andrea Revell, David Stokes, and Hsin Chen, "Small Businesses And The Environment: Turning Over A New Leaf?," Business Strategy And The Environment, Volume 19, Issue 5 (July 2010)

19 Green Seal, 2009 National Green Buying Research

20 Joe Manget, Catherine Roche, and Felix Munnich, Capturing The Green Advantage For Consumer Companies (The Boston Consulting Group, Jan 2009)

21 Andrea Revell, David Stokes, and Hsin Chen, "Small Businesses And The Environment: Turning Over A New Leaf?," Business Strategy And The Environment, Volume 19, Issue 5 (July 2010)

22 Michael S. Hopkins, "How SAP Made The Business Case For Sustainability," MIT Sloan Management Review (Aug 12, 2010)

23 MBA Oath, Class of 2009 Graduates of Harvard Business School, 2009

24 Joe Manget, Catherine Roche, and Felix Munnich, Capturing The Green Advantage For Consumer Companies (The Boston Consulting Group, Jan 2009)

25 California Air Resources Board, Updated Economic Analysis Of California's Climate Change Scoping Plan (Mar 24, 2010)

26 David Roland-Holst, Energy Efficiency, Innovation, And Job Creation In California (Center for Energy, Resources, and Economic Sustainability, Oct 2008)

27 Mark Bernstein, Robert Lempert, David Loughran and others, The Public Benefit Of California's Investments In Energy Efficiency (California Energy Commission, Mar 2000)

28 California Air Resources Board, California Employment and Small-Business Share by Industrial Sector, Updated Economic Analysis of California's Climate Change Scoping Plan, Mar 24, 2010

29 Section 8.3-A Summary of Previous Analyses of Small-Business Impacts, CARB's Updated Economic Analysis of California's Climate Change Scoping Plan Staff Report to the Air Resources Board, March 24, 2010

30 California Air Resources Board, E-DRAM Small-Business Employment Changes for Modeling Cases, Updated Economic Analysis of California's Climate Change Scoping Plan, Mar 24, 2010

31 California Air Resources Board, Climate Change Scoping Plan: A Framework For Change (Dec 2008)

32 James Stack et. Al., Cleantech Venture Capital: How Public Policy Has Stimulated Private Investment (E2, May 2007)

33 David Roland-Holst, Energy Efficiency, Innovation, And Job Creation in California (Center for Energy, Resources, and Economic Sustainability, Oct 2008)

34 Nicholas Ashford, "Pathways To Sustainability: Evolution Or Revolution?," Regional Development And Conditions For Innovation In The Network Society (Purdue University Press, 2005)

35 Hilke Bos-Brouwers, "Sustainable Innovation Processes within Small And Medium-Sized Enterprises," (PhD diss., Vrije Universiteit Amsterdam, Sep 2010)

36 PricewaterhouseCoopers, "Historical Trend Data," MoneyTree Report, https://www.pwcmoneytree.com/MTPublic/ns/nav.jsp?page=historical:

37 Cleantech Group, LLC, Clean Technology Venture Investment Totaled $5.6 Billion In 2009 Despite Non-Binding Climate Change Accord In Copenhagen, Finds The Cleantech Group And Deloitte. (Jan 2010)

38 Collaborative Economics, California Green Innovation Index 2009 (Next 10, 2009)

39 Adam Nagourney, "California Braces For Showdown On Emissions," The New York Times (Sep 16, 2010)

40 Anthony Breitzman and Diana Hicks, An Analysis Of Small Business Patents By Industry And Firm Size (Small Business Administration Office of Advocacy, Nov 2008)

41 Bob Van Dijk, Rene Den Hertog, Bert Menkveld and others, "Some New Evidence On The Determinants Of Large- And Small-Firm Innovation," Small Business Economics, Volume 9, Number 4 (1997). See discussion in Hilke Bos-Brouwers, "Sustainable Innovation Processes within Small And Medium-Sized Enterprises," (PhD diss., Vrije Universiteit Amsterdam, Sep 2010)

42 Jeroen P.J. de Jong and Orietta Marsili, "The Fruit Flies Of Innovations: A Taxonomy Of Innovative Small Firms," Research Policy, Volume 35, Issue 2 (Mar 2006).

43 Poh Kam Wong, Yuen Ping Ho, and Erkko Autio, "Entrepreneurship, Innovation, And Economic Growth: Evidence from GEM Data," Small Business Economics, Volume 24 (2005).

44 Carol Zabin and Andrea Buffa, Addressing The Employment Impacts Of AB 32, California'S Global Warming Solutions Act (UC Berkeley Center for Labor Research and Education, Feb 2009).

45 Max Wei, Shana Patadia, and Daniel M. Kammen, "Putting Renewables And Energy Efficiency To Work: How Many Jobs Can The Clean Energy Industry Generate In The US?," Energy Policy, Volume 38 (2010)

Acknowledgements

This report was authored by:
Small Business Majority with thanks to
Celia Canfield, Clean Energy Project Director
Erin Musgrave, Communications Manager
Jon Steed, Writer

Background research provided by
Blue Sky Consulting Group with special thanks
to Matthew Newman and Trisha McMahon

Small Business Majority

Small Business Majority is a California-based, national nonprofit, nonpartisan small business advocacy organization founded and run by small business owners and focused on solving the biggest problems facing small businesses today. We speak for the nearly 28 million Americans who are self-employed or own businesses of up to 100 employees. Our organization sponsors scientific research that guides us to understand and advocate on behalf of the interests of small businesses across the country.

ReuterDesign.com

SMALL BUSINESS MAJORITY

4000 Bridgeway, Suite 101
Sausalito, CA 94965
866/597-7431
info@smallbusinessmajority.org
www.smallbusinessmajority.org