



The California Green Manufacturing Action Plan

Policies to Grow Clean Energy Manufacturing Jobs in California

THE CALIFORNIA BLUEGREEN APOLLO ALLIANCE NOVEMBER 2012

Executive Summary

The California Green Manufacturing Action Plan (GreenMAP) offers policy recommendations that will help to grow clean energy manufacturing jobs in California. We are grateful to the California GreenMAP Task Force – comprised of leaders from the manufacturing, labor and environmental communities – for helping to shape these recommendations.

As we confront a continuing unemployment crisis, clean energy manufacturing offers an important opportunity to create good jobs for Californians. The California economy has shown promise in the realm of green manufacturing. The latest data for California shows that 27 percent of green jobs in the state are in manufacturing, and green manufacturing jobs increased by one percent in 2009 while California's economy as a whole registered a seven percent decrease in employment.¹ In California, people of color have increasingly benefitted from manufacturing jobs, which is important because people of color are overrepresented within the ranks of the unemployed.²

Today, California remains the leading manufacturing state in the United States, and the nation remains in a neck-and-neck race with China for the claim of being the world's leading manufacturer.³ New manufacturing investments continue to be made in California. Just this February 2012, Solar Junction, Inc. announced a successful round of fundraising, which raised \$19.2 million in new private capital to scale up its San Jose facility.⁴ Meanwhile, global investment in clean energy continues to grow, reaching a record \$260 billion in 2011, up for the sixth straight year,⁵ and over \$1 trillion has been invested globally since 2004 in clean energy projects. California and the United States need an improved public policy framework to do a better job of attracting these investments. The California GreenMAP offers a roadmap for state policymakers.

The principal recommendation is that the state should establish a California Clean Energy Bank and use auction revenue from the state's cap-and-trade program to fund

loan and loan assurance efforts.

Facilitating access to low-cost financing remains one of the best ways to encourage private sector investments in clean energy manufacturers in California. Though wage differences loom large in the public imagination when it comes to the competition for manufacturing jobs, the reality is that labor costs are a very small share of the total costs of an advanced manufacturing facility.⁶ Much more important to the overall competitiveness and viability of a project is the cost of borrowing money. Large upfront costs are one of the principle barriers to the establishment or expansion of manufacturing facilities. Newer technologies face additional hurdles because of perceived additional risks associated with newly commercialized technologies.⁷ Meanwhile, our international competitors, especially China, have been attracting factories with low interest loans and other enticements.

Creating a California Clean Energy Bank to promote affordable lending to new clean energy manufacturing facilities is the most direct and powerful way to accomplish this. The bank could stand as an office within or a subsidiary of the California Infrastructure and Economic Development Bank. Auction revenue from the cap-and-trade program to reduce heat-trapping emissions authorized under Assembly Bill 32 (AB 32, the Global Warming Solutions Act) provides a potential source of funding.

Much press attention has been given to one single unsuccessful company, Solyndra, which received support from the Department of Energy's Section 1705 Loan Guarantee Program. However, when the Loan Guarantee Program is evaluated as a whole, it is clear that the program is a tremendous success. It has spurred \$40 billion in private investments that in turn support 60,000 direct jobs and thousands of other indirect jobs at these companies' suppliers.⁸ An independent review found that the loan portfolio is performing well and should come in under budget.⁹ As with any investment portfolio, not all investments will be successful. Yet, such policy mechanisms are an important catalyst to



the commercial success of clean energy innovation. At a time when public resources are scarce, leveraging private investment through a California Clean Energy Bank makes great sense.

Another recommendation to increase access to capital for manufacturers is that **the state should press the federal government to allow Industrial Development Bonds (IDBs) in amounts up to \$100 million and take other steps to increase the use of available tax free bond issuances.** The California Infrastructure and Economic Development Bank offers IDBs, which provide tax-exempt bond financing. In order to prioritize smaller business development, IDBs have been capped by the federal government at \$10 million to support projects up to \$20 million.¹⁰ The problem is that this cap is too low. There is a critical need for support of projects in the \$20 million to \$100 million range.¹¹ While smaller businesses are deserving of special support, currently there are not enough deserving applications.

State employee pension fund holdings, university endowments and other institutional investors could be another source of capital to fund the expansion of clean energy manufacturing. **Policymakers and other state leaders should encourage the consideration of such**

responsible investment options, while recognizing the primacy of fiduciary responsibility. California institutions have been in the lead in the responsible investment movement, but more can be done.

The CA GreenMAP leaves aside the crucial issue of demand-side policies. We recognize demand-side policies as among the most important elements of a comprehensive program to grow clean energy manufacturing jobs. Nonetheless, we believe we can be most helpful with this effort through attention to the “supply side of the equation.” See the full document for more on how demand-side and supply-side policies work best together.

In closing, we provide an overview of the remaining recommendations included in the BlueGreen Apollo Alliance California Green Manufacturing Action Plan:

- Continue the Advanced Transportation and Alternative Source Manufacturing Sales and Use Tax Exclusion Program.
- Continue the Public Interest Energy Research (PIER) Program through the Electric Program Investment Charge that is being developed by the California Public Utilities Commission. Such programs keep



California on the cutting edge of clean energy technology and manufacturing.

- Support continued funding for high road green workforce training programs.
- Continue and expand support targeting small and medium-sized clean energy manufacturers in the California. Broaden the services of the Manufacturing Extension Partnerships and undertake outreach efforts that target clean energy manufacturers (CEMs).
- Develop more effective permitting processes: At the state and local level, the regulatory process for building a new factory or expanding an existing one should be reevaluated with an eye toward increased efficiency.
- Push for improvements in federal clean energy manufacturing policy.

Please see the full California GreenMAP document for more details about these recommendations and for a list of the members of the California GreenMAP Task Force.

Introduction

The policy recommendations outlined here will help to grow clean energy manufacturing jobs in California. Clean energy technology is a large and growing global market. In 2011, global investment in clean energy technologies increased to a record \$260 billion, up for the sixth straight year.¹² Since Bloomberg New Energy Finance started tracking the data in 2004, over \$1 trillion has been invested globally in these technologies. Clean energy investment has experienced 30.5 percent annual growth on average since 2004.

Manufacturing jobs are worth focusing on because they typically offer good pay and benefits. Recent research from Brookings has shown that green jobs pay better than average, and they are being accessed by workers with lower education levels than jobs overall.¹³ The Brookings study also found that, nationwide, 26 percent of green jobs are in the manufacturing sector. The latest data for California shows that 27 percent of green jobs in the state are in manufacturing.¹⁴ From January 2009 to January 2010, green manufacturing jobs increased by one percent while California's economy as a whole registered a seven percent decrease in employment. In addition, in California, people of color have increasingly benefitted from manufacturing jobs, which is important given that people of color are overrepresented within the ranks of the unemployed.¹⁵

Today, California is the leading manufacturing state in the United States, and the nation remains in a neck-and-neck race with China for the claim of being the world's leading manufacturer.¹⁶ The United States is the third largest exporter of manufactured goods in the world, following China and Germany.¹⁷ New manufacturing investments continue to be made in California. Just this February 2012, Solar Junction, Inc. announced a successful fundraising effort, having raised \$19.2 million in new private investment to scale up its San Jose facility.¹⁸

In order to offer advice on what additional steps California can take to attract manufacturing enterprises and the good jobs they create, the California BlueGreen Apollo Alliance convened a task force representing manufacturer, investor, labor and environmental perspectives. The following are the California BlueGreen Apollo Green Manufacturing Action Plan (GreenMAP) policy recommendations.

A salute to demand-side policies

With these recommendations for growing clean energy manufacturing jobs we focus on what we call the "supply-side" of the challenge. Yet, it must be recognized that without demand for clean energy technologies, there would not be any jobs manufacturing them. Renewable energy technologies have become increasingly cost competitive, but there continues to be an important role for public policy to accelerate their adoption for the clean air, energy security, public health and other benefits they deliver.

While the U.S. should aim to better compete in foreign markets, our domestic market is the largest in the world, and U.S. manufacturers need to do a better job of competing at home first. Domestic and local demand can be crucial to the resurgence of domestic manufacturing. A recent example is San Diego Gas & Electric leveraging solar purchase agreements to lure a manufacturer to locate in San Diego. Manufacturers have increasingly recognized the value of being closer to customers. A related trend involves increasing recognition of the value of more compact, less far-flung supply chains. Domestic and local demand can be a way to attract not just original equipment manufacturers, but entire supply chains.

Recommendations

California has been a leader in clean energy policies for many years. The Governor's recent signature into law of a standard requiring that utilities use at least 33 percent renewable electricity has reconfirmed that position. More should be done to continue to bolster the clean energy market in California. Moreover, to make demand-side policies effective, more needs to be done to upgrade our electricity grid to bring it into the 21st Century, including getting new transmission lines built to areas ripe for renewable energy development.

1. Improve access to capital for clean energy manufacturers.

Facilitating access to low-cost financing remains one of the best ways to encourage private sector investments in clean energy manufacturers (CEMs) in California. In the aftermath of the financial crisis, lenders have become overly cautious. Newer technologies, like clean energy, face additional hurdles because of the perceived additional risks associated with newly commercialized technologies.¹⁹ Further, our international competitors, especially China, have been luring new factories with low interest loans and other enticements. Though wage differences loom large in the public imagination when it comes to manufacturing, the reality is that labor costs are a very small share of the overall costs of an advanced manufacturing facility.²⁰ Much more important to the overall competitiveness and viability of a project is the cost of borrowing money.

- a. *Establish a California Clean Energy Bank and use auction revenue from the state's cap-and-trade program to fund loan and loan assurance efforts.*

At a time when California needs investment to grow jobs, upfront costs are one of the principle barriers to the development of these facilities. By promoting affordable lending to new clean energy manufacturing facilities, California will improve the state's competitive position. A



Clean Energy Bank will concentrate efforts and expertise, thereby maximizing the benefits of new financing support. A California Clean Energy Bank should also finance power generation projects and not just manufacturing enterprises.

Auction revenue from the cap-and-trade program to reduce heat-trapping emissions authorized under Assembly Bill 32 (AB 32, the Global Warming Solutions Act) provides a potential source of funding. Auction revenue from the cap-and-trade program must be spent in ways that contribute to greenhouse gas emission reductions. Producing clean energy generation technologies in highly efficient California manufacturing facilities should meet this criterion. At a time when public resources are scarce, leveraging private investment through a California Clean Energy Bank makes great sense.

Much press attention has been given to one single unsuccessful company, Solyndra, which received support from the Department of Energy's Section 1705 Loan Guarantee Program. However, when the Loan Guarantee Program is evaluated as a whole, it is clear that the program is a tremendous success. It has spurred \$40 billion in private investments that in turn support 60,000 direct jobs and thousands of other indirect jobs at these companies' suppliers.²¹ An independent review found that the loan portfolio is performing well and should come in under budget.²² As with any investment portfolio, not all investments will be successful. Yet, such policy mechanisms are an important catalyst to the commercial success of clean energy innovation.

Innovation has contributed to record declines in cost. Solar module prices have fallen approximately 75 percent over the last three years. The total installed cost of solar fell by 17 percent in 2010 and by another 11 percent in the first half of 2011.²⁵ Yet, despite all these positive indicators, challenges remain. Some of these cost declines can surely be traced to subsidies and other government assistance made available by Chinese authorities. These have been estimated at \$30 billion.²⁶ And these have created challenges for some U.S. manufacturers. Though the solar industry achieved a \$1.9 billion net positive trade balance in 2010, according to the most recent annual data available, the U.S. had a deficit in solar photovoltaic modules at the same time, mainly due to

Chinese imports.²⁷

- b. Take steps to increase the use of available tax-free bond issuances. The state should press the federal government to allow Industrial Development Bonds in amounts up to \$100 million.

Another area the state is not fully taking advantage of is its allocation of federal tax-free bonds. The Infrastructure and Economic Development Bank is authorized to issue Industrial Development Bonds (IDBs) that could capitalize the expansion of clean energy manufacturing. The Infrastructure and Economic Development Bank is California's only general purpose financing authority, and it has broad statutory powers to issue revenue bonds, make loans and provide credit enhancements for a wide variety of infrastructure and economic development projects and other government purposes.²⁸ Its Industrial Development Revenue Bond Program can provide tax-exempt conduit revenue bond financing — i.e., low-cost financing of up to \$10 million — for the acquisition, construction, rehabilitation and equipping of eligible small- to mid-size manufacturing companies.

IDBs are one of several types of bonds that can be issued out of the state's tax free allocation, which is determined on a per capita basis. The state has not been maximizing the use of these. In 2009 and 2010, the total amount of bonds issued fell about \$1.5 billion short of the maximum

The surging solar industry

The solar industry illustrates both the promise of, and the challenges to, this endeavor. Solar investment was the standout in 2011 clean energy investment, growing 36 percent over the year before reaching \$137 billion invested. These investments are translating to job gains. The Brookings Institutions' recent study shows 18.4 percent job growth in solar thermal energy and 10.7 percent job growth in solar photovoltaic (PV) energy from 2003 to 2010.²³ As of August 2011, the solar industry employed over 100,000 people.²⁴



allowed. In 2011, about \$1.1 billion less than the allowable amount were issued, including only \$50 million in IDBs.²⁹ A missed opportunity of this proportion is particularly unfortunate at a time of when investment is badly needed to bolster the recovery.

One reason that so few IDBs have been issued is that the state has received few qualified applications. The Clean Energy Bank we propose should help with outreach capacity. Another issue the bank may be able to assist with is the need to get a bank or other rated-institution to lend its credit rating to the project – to provide the Letter of Credit, which is a precondition for bond issuance – as well as the attendant fees.

The governor and other state policymakers should press the federal government to allow IDBs in amounts up to \$100 million. In order to prioritize smaller business development, IDBs have been capped at \$10 million to support projects up to \$20 million.³⁰ The problem is that a critical need for financing new clean energy projects occurs in the \$20 million to \$100 million range.³¹ While smaller businesses are deserving of special attention, currently there are not enough deserving applications and a surplus is available. If this broadened eligibility results in the application process becoming competitive, small businesses should be given a dedicated portion of the allocation to ensure that they continue to benefit. Also, we recommend other targeted support for smaller manufacturers.

c. Leverage state employee pension fund holdings, university endowments and other institutional investors to provide financing for CEM projects in the state. Policymakers and other state leaders should encourage the consideration of such responsible investment options.

The Environmental Investment Initiative (aka “Green Wave”) of the California Public Employees’ Retirement System (CalPERS) and California State Teachers’ Retirement System (CalSTRS) — the nation’s largest and third largest public pension funds, respectively, with combined assets of \$250 billion — has delivered

strong returns compared to other investments in the funds’ portfolio. At the same time, the Green Wave initiative produced energy savings through greater energy efficiency.³² This initiative was launched in 2004 with the purpose of committing \$1.5 billion in cutting-edge technologies and environmentally-responsible companies. This includes investing a combined \$500 million for targeted investments in clean technologies.³³ Since 2006, CalPERS has committed \$500 million to external managers in its Global Equity asset class who restrict companies with a negative environmental footprint. CalPERS has committed more than \$1.5 billion to its private equity Environmental Technology Program.³⁴

Now is the time to assess whether further investment in clean energy might be warranted. California has a strong competitive position because of connections between manufacturing of semiconductors and solar photovoltaic technology. CalPERs and CalSTRs should consider adding a geographic targeting component of their programs in order to prioritize investment within California. Finally, given that California does not have direct authority on the question of the \$10 million dollar limit on Industrial Development Bonds, we urge the examination of whether these retirement systems might help address the financing gap in the \$20 million to \$100 million range. This could occur as part of the fixed income portion of their portfolio. The retirement systems could directly purchase bonds. Alternatively, the CalPERs or CalSTRs could loan the state money with a fixed return via interest. This second option, the “loan and invest option,” would provide greater flexibility. Of course, fiduciary responsibility must always be the ultimate screen, but we are confident new clean energy investments will pass this test.

d. Build on existing programs.

California has a strong legacy of supporting the growth of a clean energy industry with various forms of financial assistance. In recent years, this has included state programs that provide loans and grants to clean energy manufacturers. These programs deserve continued support, especially as the federal American Reinvestment



and Recovery Act (ARRA) funds that helped some of these programs phase out. Below, we will outline what steps can be taken to ensure that these important programs continue to yield gains for California in terms of growing clean energy and manufacturing jobs.

The proposed Clean Energy Bank should incorporate and expand on the Clean Energy Business Financing Program (CEBFP), which has been capitalized by ARRA funds that will soon be expended. This program is one of two that the California Energy Commission (CEC) currently offers under the umbrella of a clean energy manufacturing program. The CEBFP provides low-interest loans to manufacturers for retooling, improving, modifying, or expanding renewable product manufacturing facilities. Using federally-granted State Energy Program funding provided by ARRA, the CEC — which administers the program — provided up to \$30.6 million in 2.75 percent low-interest loans to clean energy manufacturers in 2010 to 2011, to be paid back over seven years. It is estimated that this program will leverage from \$145 million to \$175 million in private capital through its matching requirements.

The Alternative and Renewable Fuel and Vehicle Technology Program provides up to \$100 million per year in grants, loan guarantees, revolving loans and other financial assistance to develop and deploy alternative and renewable fuels and advanced transportation

technologies. This program does not directly relate to cleaner electricity, but it does relate to the broader challenge of growing clean energy jobs. Established by AB 118 in 2007 and amended by AB 109, the Program provided \$59.5 million to support projects related to biomethane production, ethanol production incentives, vehicle and component manufacturing, and advanced biofuel production. The Program is also authorized to establish workforce training programs.

2. Continue the Advanced Transportation and Alternative Source Manufacturing Sales and Use Tax Exclusion Program.

Administered by the California Alternative Energy and Advanced Transportation Authority and authorized by SB 71, the Advanced Transportation and Alternative Source Manufacturing Sales and Use Tax Exclusion Program provides an exemption to manufacturers from the state's 8.25 percent sales tax when they purchase of property used for the design, manufacture, production, or assembly of advanced transportation technologies or alternative energy source products, components, or systems.³⁵ Applicants are evaluated according to fiscal, environment and employment benefits that the projects would provide to the state and local jurisdictions, produced by the manufacturing facilities and purchases from related suppliers.³⁶ Manufacturers have found the application process to be overly burdensome. We support

simplification, while retaining the components that ensure adequate job creation and broader public benefits to justify this investment of public funds.

3. Continue and enhance research and development and innovation programs that keep California on the cutting edge of clean energy technology and manufacturing.

Research and Development (R&D) and technology innovation are critical to California's clean energy manufacturers maintaining their competitiveness in domestic and global markets. California supports several programs aimed at developing and promoting the commercialization of advanced clean energy technologies, including R&D tax credits, R&D grants and innovation clusters. In addition to critical basic R&D investment, the state must also support investments in the demonstration and deployment of efforts that help create a path to commercialization and economies of scale necessary for market transformation.

- a. *Continue the Public Interest Energy Research (PIER) Program through the Electric Program Investment Charge that is being developed by the California Public Utilities Commission.*

Created in 1996 by AB 1890, and reauthorized in 2006 by SB 1250, PIER has grown to be the nation's largest state energy R&D effort.³⁷ The continuation of the PIER program is an important component to the retention of California's innovation edge. The PIER program is the state's premier energy Research, Development and Demonstration program, advancing science and technology in the fields of energy efficiency; renewable energy; advanced electricity technologies; energy-related environmental protection, transmission and distribution; and transportation. Funding recipients have included businesses, utilities, energy companies, public advocacy groups and world-class scientists at California's universities and national laboratories. In the last decade, PIER has invested more than \$700 million to bring to market energy technologies that provide environmental and economic benefits to California's ratepayers.

- b. *Continue support and expansion of the state's Innovation Hubs (iHubs) program.*

Launched in early 2010, former Governor Schwarzenegger's iHub initiative seeks to spur public-private partnerships, economic development and job creation around specific research clusters throughout the state. The iHubs are operated by local partnerships of local government entities, universities, businesses, venture capitalist networks, economic development organizations and non-profits. They target young, innovative companies that have been in business less than eight years in a technology cluster identified by the consortium.³⁸ To date, there are a dozen designated iHubs throughout the state. Although any kind of advanced technology cluster is allowed (e.g., biotechnology), emerging clean energy technologies are a leading focus for most of the iHubs.³⁹

4. Support continued funding for high road green workforce training programs.

For California to remain competitive in the clean energy economy, we need a high-skilled, well-trained workforce able to adapt to changing industry standards. We need to ensure that resources are invested into workforce training programs that are a direct response to industry demands and lead to high-road jobs with career pathways for workers. In order to optimize the use of training funds, the taskforce makes the following two recommendations: accountability for job-training programs that lead to quality job placement, and mandated cross-agency collaboration for better alignment of workforce funds.

The taskforce recommends the model of workforce funding administered through the California Employment and Training Panel (ETP). ETP is a jointly administered labor-management partnership, that uses a performance-based model requiring funding recipients to not only show the industry relevance of their training, but also to provide proof of job placements and wage-gain as a result of the training. Applicants are required to go before the Panel to defend their programs, and if they do not meet the established requirements, their money can be clawed-back.

The taskforce further recommends that the state should require cross-agency collaboration that will allow grants for clean energy manufacturing and infrastructure to better align with grants available for workforce training. This collaboration would allow for a better leveraging of resources, providing increased assurance that training programs will better meet the needs of industry, leading to increased job placement opportunities for trainees.

5. Continue and expand support targeting small- and medium-sized clean energy manufacturers in California. Broaden the services of the Manufacturing Extension Partnerships and undertake outreach efforts that target CEMs.

California has two affiliates of the federal Hollings Manufacturing Extension Partnership (MEP) of the National Institute of Science and Technology under the U.S. Department of Commerce: the Corporation for Manufacturing Excellence in San Ramon and California Manufacturing Technology Consulting in Torrance. The Corporation for Manufacturing Excellence, founded in 1995, provides high-value consulting and business advisory services that help manufacturers in Northern California. It also holds a significant contract with California's Employment Training Panel to assist manufacturers in enhancing the skills of their workforces. California Manufacturing Technology Consulting also provides consulting and technical services for improving organization, industry productivity and global competitiveness of manufacturers in Southern California. These MEP centers have provided assistance to companies in a wide range of manufacturing industries, but only a few in the clean energy sector.

6. Develop more effective permitting processes: At the state and local level, the regulatory process for building a new factory or expanding an existing one should be reevaluated with an eye toward increased efficiency.

We urge reforms that do not comprise important protections for public health, environmental quality



and worker safety. Overlapping regulation should be rationalized to reduce the costs of compliance for business. We support efforts underway being led by the Brown Administration to assist counties and other permitting bodies to harmonize their processes toward the end of siting more clean energy projects, including clean energy manufacturing facilities.

7. Push for improvements in federal clean energy manufacturing policy.

As the nation's biggest economy and largest manufacturing state, California can be an important voice in the national debate on manufacturing policy. The lack of a coherent national approach has put the United States at a competitive disadvantage in the global markets for clean energy products. California's federal policymakers should advocate for a comprehensive national manufacturing policy. California's global leadership in clean energy technology and production puts the state in a uniquely strong position to push for national clean energy policies. We already mentioned one federal priority in the context of our Clean Energy Bank discussion: State officials and California's federal representatives should press the national government to allow IDBs in amounts up to \$100 million. In addition, some specific national initiatives that

deserve strong support include the following:

- State-level revolving loan funds to help manufacturers improve their energy efficiency or retool their plants to produce clean energy products.
- The reinitiation of the Advanced Manufacturing Tax Credit (48c) created as part of the ARRA stimulus package in 2009. This has been an extremely popular program for clean energy manufacturers. Unfortunately, the program was so popular that it exhausted its \$2.3 billion long before it could fulfill the needs of the manufacturing sector. Less than a third of the eligible projects received the 30 percent tax credit prior to funds running out.⁴⁰

Conclusion

As demand for clean energy products continues to surge – in California and globally – now is the time to capitalize on California’s manufacturing leadership and maximize family-supporting job creation in our clean energy manufacturing sector. By taking the steps laid out in the California BlueGreen Apollo Green Manufacturing Action Plan, we can accelerate job growth and help the clean energy sector lead the way back to full employment, a cleaner environment, and more secure energy future.

Acknowledgements

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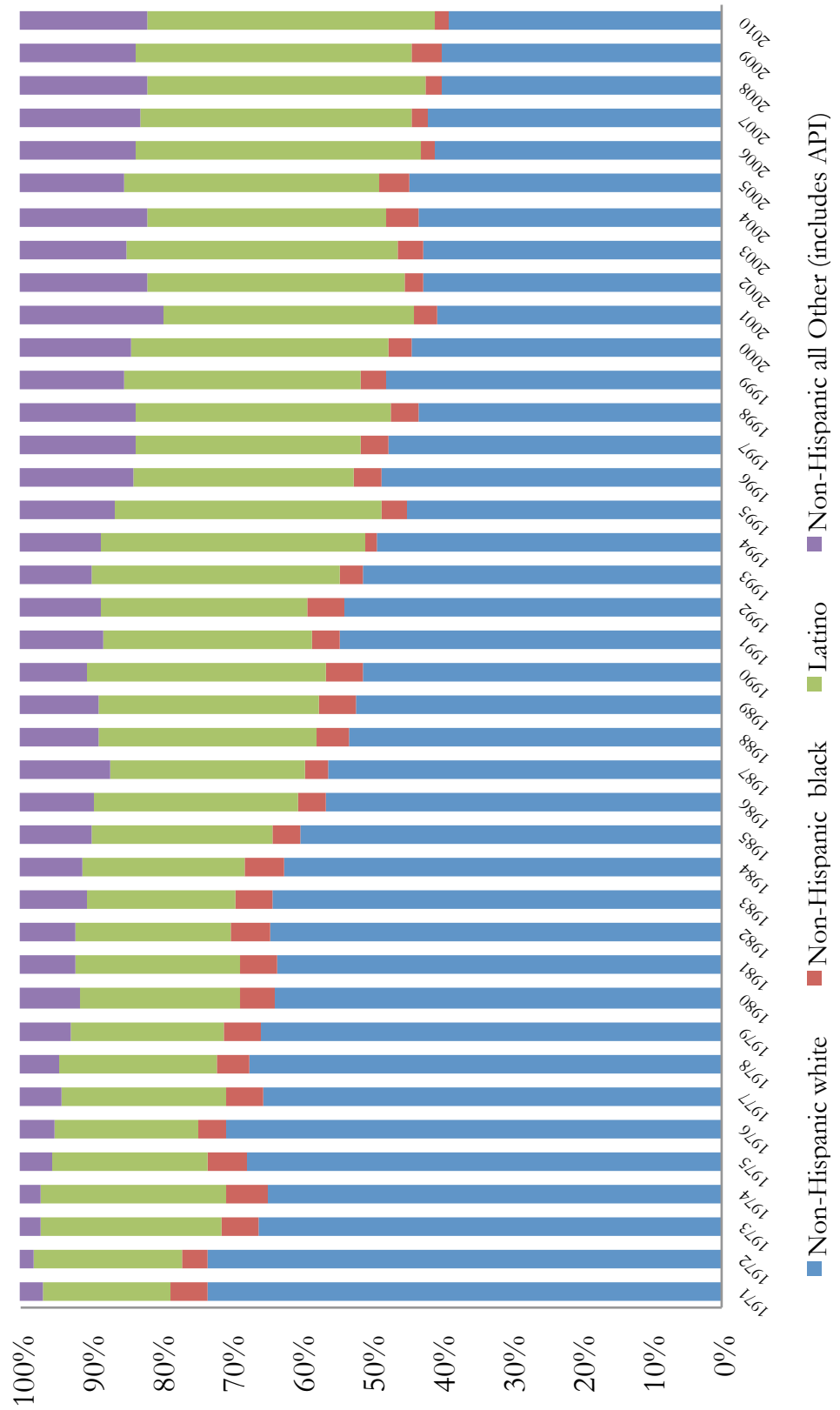
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Appendix 1.

Breakdown of Manufacturing Employment in California by Race, 1971 -2010

(Data analysis by Professor Manuel Pastor and associates at the Program for Environmental and Regional Equity, University of Southern California.)



Endnotes

- 1 Next 10. "Many Shades of Green." http://next10.org/next10/publications/green_jobs/2011.html.
- 2 As of 2010, 61 percent of manufacturing jobs were held by people of color. This is up from less than 32 percent in 1971. Data analysis provided by Professor Manuel Pastor, who conducted this analysis at our request for this project. The research is unpublished, but the results are available upon request and are depicted in Appendix 1.
- 3 California is, by far, the leading manufacturing state in the U.S. as it generated \$129,380,000,000 (129 billion) in durable goods and \$90,850,000,000 (90 billion) in non-durable goods in 2010. The next most productive state was Texas, which generated \$85,004,000,000 (85 billion) in durable goods and \$75,741,000,000 (75 billion) in the same year. (Reference: U.S. Department of Commerce - Bureau of Economic Analysis - Regional Data). Data from the United Nations Statistics Division shows China passing the U.S. in 2010 as the world's largest manufacturer in value added. In that year, the U.S. generated 1.85 trillion USD while China generated 1.92 trillion USD, compared to 2009 when the U.S. generated 1.73 trillion USD compared to China's 1.61 trillion USD. (Reference: United Nations Statistics Division - National Accounts Main Aggregates Database).
- 4 "Solar Junction raises \$13.2 million for manufacturing push." 2/13/2012. San Jose Business Journal.
- 5 Bloomberg New Energy Finance. 1/12/2012. "Solar surge drives record clean energy investment in 2011." <https://www.bnef.com/PressReleases/view/180>.
- 6 For example, Joe Laid, CEO of Miasole (a thin film solar manufacturer), says that in the U.S. "labor costs are just a couple of cents per watt higher than in China." Greenwire, 3/3/2011.
- 7 See for example, the comments of the founder of the company Nanosolar, here: <http://energy.nationaljournal.com/2011/08/how-can-washington-green-ameri.php>.
- 8 "Independent Report Review Confirms Energy Loan Portfolio is Expected to Perform Well." 2/10/2012. <http://www.whitehouse.gov/blog/2012/02/10/independent-report-review-confirms-energy-loan-portfolio-expected-perform-well>.
- 9 "Report of the Independent Consultant's Review with Respect to the Department of Energy Loan and Loan Guarantee Portfolio." 1/31/2012. http://www.whitehouse.gov/sites/default/files/docs/report_on_doe_loan_and_guarantee_portfolio.pdf.
- 10 Section 144(a)(4)(A) sets this limit.
- 11 Brookings Institution. 2011. Sizing the Clean Economy. p. 37.
- 12 Bloomberg New Energy Finance. 1/12/2012. "Solar surge drives record clean energy investment in 2011." <https://www.bnef.com/PressReleases/view/180>.
- 13 The Brookings Institution. 2011. "Sizing the Clean Economy."
- 14 Next 10. "Many Shades of Green." http://next10.org/next10/publications/green_jobs/2011.html.
- 15 As of 2010, 61 percent of manufacturing jobs were held by people of color. This is up from less than 32 percent in 1971. Data analysis provided by Professor Manuel Pastor, who conducted this analysis at our request for this project. The research is unpublished, but the results are available upon request and are depicted in Appendix 1.
- 16 California is by far the leading manufacturing state in the U.S. as it generated \$129,380,000,000 (129 billion) in durable goods and \$90,850,000,000 (90 billion) in non-durable goods in 2010. The next most productive state was Texas, which generated \$85,004,000,000 (85 billion) in durable goods and \$75,741,000,000 (75 billion) in the same year. (Reference: U.S. Department of Commerce - Bureau of Economic Analysis - Regional Data). Data from the United Nations Statistics Division shows China passing the U.S. in 2010 as the world's largest manufacturer in value added. In that year, the U.S. generated 1.85 trillion USD while China generated 1.92 trillion USD, compared to 2009 when the U.S. generated 1.73 trillion USD compared to China's 1.61 trillion USD. (Reference: United Nations Statistics Division - National Accounts Main Aggregates Database).
- 17 Michael Ettlinger and Kate Gordon. April 2011. The Importance and Promise of American Manufacturing. Center for American Progress. See page 2. Based on 2008 data, which was the most recent available with comprehensive coverage.
- 18 "Solar Junction raises \$13.2 million for manufacturing push." 2/13/2012. San Jose Business Journal.
- 19 See for example, the comments of the founder of the company Nanosolar, here: <http://energy.nationaljournal.com/2011/08/how-can-washington-green-ameri.php>.
- 20 For example, Joe Laid, CEO of Miasole (a thin film solar manufacturer), says that in the U.S. "labor costs are just a couple of cents per watt higher than in China." Greenwire, 3/3/2011.
- 21 "Independent Report Review Confirms Energy Loan Portfolio is Expected to Perform Well." 2/10/2012. <http://www.whitehouse.gov/blog/2012/02/10/independent-report-review-confirms-energy-loan-portfolio-expected-perform-well>.
- 22 "Report of the Independent Consultant's Review with Respect to the Department of Energy Loan and Loan Guarantee Portfolio." 1/31/2012. http://www.whitehouse.gov/sites/default/files/docs/report_on_doe_loan_and_guarantee_portfolio.pdf.
- 23 The Brookings Institution. 2011. "Sizing the Clean Economy." See Table 2, page 22. In addition to these sector gains, clean energy jobs together grew at a rate of 8.3 percent, nearly twice as fast as the overall economy's employment gains over the 2003-2010 time period.
- 24 100,237 workers according to The Solar Foundation's National Solar Jobs Census 2011.
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- 27 Greentech Media. "U.S. Solar Energy Trade Assessment 2011: Trade Flows and Domestic Content for Solar-Energy Related Goods and Services in the United States." Prepared for the Solar Electric Industries Association.
- 28 The I-Bank began full operations in 1999, after implementation of Chapter 4, Statutes of 1998 (SB 1184). It began with transactions associated with Rate Reduction Bonds issued in FY 1997-1998 and has steadily grown from \$6.0 billion to over \$31 billion in debt financing. California Infrastructure and Economic Development Bank (I-Bank), Description of the I-Bank and Programs, Updated 11/2010.
- 29 http://www.treasurer.ca.gov/cdlac/programyear/2011/08_Summary_of_Public_Benefit_Analysis.pdf. To be specific, the state's allocation of tax free authority from the federal government amounted to \$3,539,125,820 in 2011.
- 30 Section 144(a)(4)(A) sets this limit.
- 31 Brookings Institution. 2011. "Sizing the Clean Economy." p. 37.
- 32 "CalPERS Global Real Estate Environmental Initiative Update: Report to the Investment Committee." 2009. <http://www.calpers.ca.gov/eip-docs/about/board-cal-agenda/agendas/invest/201012/item08b-2-01.pdf>. "CalPERS Deploys \$500 Million to New Environmental Investment Strategy." 2010. <http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-archive/pr-2010/nov/calpers-deploys.xml>.
- 33 "State Treasurer Phil Angelides Launches 'Green Wave' Environmental Investment Initiative to Bolster Financial Returns, Create Jobs and Clean Up the Environment." News Release, California State Treasurer. 2/3/2004.
- 34 "CalPERS Deploys \$500 Million to New Environmental Investment Strategy." 2010. <http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-archive/pr-2010/nov/calpers-deploys.xml>.

- 35 California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA). "2010 Annual Report to the California State Legislature." Sacramento, CA, 3/2011. Governor Arnold Schwarzenegger signed the SB 71 Program into law on March 24, 2010. The Authority began receiving applications in October 2010 and the first round of applicants received approval in November 2010. SB 71 expanded the eligibility for STEs from only new equipment purchases for zero-emissions vehicles (ZEV) to all clean-tech manufacturers.
- 36 Approved applicants must make at least 25 percent of the qualified property purchases within the first year of approval, and they have up to three years to complete all their approved property purchases and receive the STE. However, CAEATA has waived the 25 percent requirement for the time being.
- 37 See <http://www.energy.ca.gov/pier/>. A full listing of the PIER portfolio can be found at <http://www.energy.ca.gov/pier/portfolio/PIERwrite-ups.htm>. See also: http://www.energy.ca.gov/research/reports_pubs.html and http://www.energy.ca.gov/publications/pier_factsheet_search.php.
- 38 iHubs are anchored by at least one major university center/institution, at least one economic development corporation, and typically contain assets such as research parks, technology incubators, universities, community colleges, business accelerators and federal laboratories. Each iHub is designated for a period of five years. The ultimate purpose is to create links to the Governor's Office of Economic Development and encourage a stronger relationship with local government entities within various regions, helping to remove barriers to public-private collaborations needed to commercialize technology. Governor's Office of Economic Development (GoED). California Investment Guide, An Overview of Advantages, Assistance, Taxes & Permits, Sacramento, CA, 11/2010. 7.
- 39 For example, San Jose/Silicon Valley Emerging Technology Innovation Hub will forge stronger relationships among San Jose and local and eventually national and international partners to nurture and accelerate the commercialization of clean and emerging technologies. The Clean Tech Los Angeles iHub is a partnership between the City's business, academic, and government institutions focused on developing a world class clean technology cluster. The Sacramento iHub focuses on medical and clean technologies. See <http://www.business.ca.gov/Innovation.aspx>.
- 40 Department of Energy. Selections for Section 48C Manufacturing Tax Credit (Excel database). California companies received \$235.5 million from the program the first time around, and the state has multiple approved projects and millions of dollars waiting for the tax credit to receive more funding.

The BlueGreen Alliance is a national, strategic partnership between labor unions and environmental organizations dedicated to expanding the number and quality of jobs in the green economy.

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