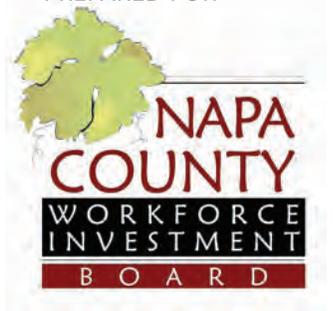




Napa County's Emerging Green Economy



PREPARED FOR



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REPORT PREPARED FOR
Napa County Workforce Investment Board

REPORT PREPARED BY
Jim Cassio & Associates in association with Craft Consulting Group

Executive Summary

The emerging green economy is generating new job opportunities and a demand for workers with green knowledge, skills, and credentials. These job opportunities include both new jobs and traditional jobs that are adapting to changing market realities. While there is no single agreed upon definition of what constitutes the green economy, there is general consensus on the concept and scope. Broadly defined the green economy describes both: 1) products and services, as well as 2) business practices and processes that dramatically reduce the demand for energy and increase the efficient use of resources. In estimating the number of green jobs, the Bureau of Labor Statistics makes a distinction between establishments that: (1) produce green goods or provide green services and those that (2) use green business practices or environmentally friendly production processes.

Companies producing green products and providing green services cover a number of different market segments that have been described by the Cleantech Group, New Energy Finance, Environmental Business International, US Green Building Council, Next 10, and others. The production of green products and the provision of green services are considered by many to be the core green economy. This core green economy can be divided into various market segments covering clean technology, clean energy, green building, environmental technologies, and other sectors.

Over the past decade, organizations of all types and sizes in nearly every industry sector have started to adopt green business practices. By adopting green business practices businesses can improve their environmental performance while enhancing their bottom line. Third-party verification of green business practices validates a company's claims that it has achieved a certain level of compliance and/or met the standards established by a credible third-party organization.

Napa County has adopted a certified green business program that is affiliated with ABAG's Green Business Program and the Napa Green Certified Winery and Land program developed by Napa Valley Vintners. The certified green business and winery program is coordinated by the County's Environmental Management Department which is responsible for providing information and technical assistance to local businesses about green business practices applicable to their industry. The goal of the Napa Green Business Program is to assist businesses of all types in complying with environmental regulations and going beyond compliance to adopt voluntary standards in four areas: energy-efficiency; water conservation; pollution prevention; and solid and hazardous waste reduction and recycling. Many of the certified green businesses fall into more than one market segment.

For the purposes of this study, to avoid duplication, companies that have adopted green business practices and also produce green products and/or services are listed in the later category and not listed as a certified green business. Green Vineyards and Wineries, for example, were listed only in that category. As a result, this study identified 174 green

businesses located in Napa County spread across several green market segments. Green product and service businesses comprise 1.2% of all businesses in Napa County. This compares favorably with the nation (0.9%) and state (1.0%). Almost two-thirds of the green businesses are located in the City of Napa (62.5%) followed by St. Helena (17.9) a distance second, and Calistoga (6.5%) with the third largest number of green businesses. American Canyon has the distinction of being Napa County's second largest city, but the city with the fewest green businesses per capita.

Almost 95% of the green businesses are small firms with fewer than 100 employees. Green businesses with the largest number of employees include green wineries and remediation firms.

There are approximately 3,687 workers employed in Napa County green businesses. Green business employment represents 5.4% of the total employment in the county. Employment in green businesses cuts across a broad range of industry sectors with manufacturing, business support, and hospitality sectors having the largest number. However, employment in green businesses does not imply all are green jobs. The largest numbers of jobs are in businesses utilizing green business practices and production processes, including sustainable agriculture, green wineries and certified green businesses. Most of the jobs in these sectors involve occupations where there is no significant change in the work or skill requirements.

In contrast, jobs in businesses producing green products or providing green services are nearly always considered to be green jobs. These jobs account for approximately 1% of Napa County's total private sector jobs. This compares favorably with the Pew study of the nation's clean energy economy (0.7%) and Next 10's study of the state's core green economy (1.2%).

Many of the employers we surveyed seem confident that they will continue to add jobs over the next six months to two years. Although the survey was conducted during tough economic times, the majority of green business employers expect the number of jobs in their company to remain the same, and nearly one in five employers expect to add new workers over the next six months.

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EMERGING GREEN ECONOMY

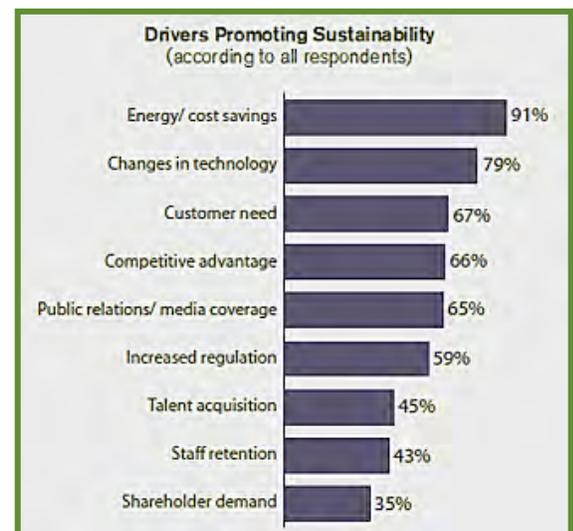
Introduction

The emerging green economy is generating new job opportunities and a demand for workers with green knowledge, skills, and credentials. These job opportunities include both new jobs and traditional jobs that are adapting to changing market realities.

Driven by growing consumer demand, public policy, venture capital and public-sector investment, the green economy in the U.S. comprises more than 68,000 businesses and accounts for about 770,000 jobs according to a recent study by the Pew Charitable Trust¹. Other studies which vary in their approach estimate the size of the green economy to range from 719,600 to 2.5 million green jobs. While this represents less than 1% of all jobs and business establishments in the United States, green jobs are growing at a faster pace than overall jobs. The Pew Study found that jobs in the emerging green economy grew by 9.1 percent between 1998 and 2007, while total jobs grew by just 3.7 percent. Green jobs are spread across all fifty states and include a mix of white- and blue-collar positions ranging from scientists, engineers and educators to electricians, machinists, and technicians.

In addition to creating green products and providing green services, businesses of all types are adopting green business practices in response to strategic needs and market requirements or to pressure from customers, shareholders, competitors, and regulators. In the third annual edition of the GreenBiz Index, Clean Edge - a leading cleantech research and publishing firm, measures a representative basket of 20 indicators on the green-economy's progress - from energy use to e-waste to employee commuting habits - that show the environmental performance progress of U.S. companies. In the aggregate, the GreenBiz Index paints a portrait of a green economy that is slowly emerging. The GreenBiz Index shows the incremental change and progress that is occurring in reducing the energy, water, materials, carbon and toxic intensity of the U.S. economy.

Although progress has been slow it is expected to accelerate as more businesses adopt green business practices to reduce their environmental footprint and to improve their bottom line. Many of the largest U.S. corporations are now reporting their efforts in implementing green business practices that go beyond those which are required by law. Sustainability is no longer seen as a niche activity. According to a McGraw Hill Study there has been "substantial growth in sustainability activity over the last three years with a shift in focus from internal operations and public relations to a core part of business



Source: McGraw Hill/Siemens

¹ Pew Research, "The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America", June 2009

performance.”² Primary drivers include cost savings, operational improvements, and market demands.

As more companies adopt sustainability initiatives and green business practices the demand for green job skills will increase. Job seekers and workforce training organizations alike are seeking information about green job opportunities and occupational requirements. While green jobs are of interest to a wide variety of stakeholders, various studies define the term differently. The common thread running through the various studies is that green jobs are related to protecting or improving the environment. Several categories of green activity are also widely cited including: producing energy from renewable sources, improving energy efficiency, preventing and cleaning up pollution and greenhouse gases, and conserving natural resources.

The purpose of this report is to provide Napa County employers and job seekers with information about the emerging green economy. However, measuring the number of green businesses and green jobs is very difficult due to the lack of a universally accepted definition and the evolving nature of the green economy. None of the existing classification systems such as the North American Industry Classification System (NAICS) and the Standard Occupational Classification (SOC) are adequate since green business activities are not confined to specific industries or occupations. Therefore a definition and methodology for identifying green firms must first be established.

WHAT IS THE GREEN ECONOMY?

While there is no single agreed upon definition of what constitutes the green economy, there is a broad consensus on the general concept and scope. At the core of most green economy definitions are the concepts of sustainability, environmental protection, and waste reduction. One of the most widely accepted definitions of sustainability comes from the United Nations Brundtland Commission, which defined sustainable development as “*meeting the needs and aspirations of the present without compromising the ability of future generations to meet their own needs*”.³ Under this definition, sustainability encompasses a wide range of economic activity that is related to decreasing pollution and greenhouse gas emissions, reducing waste and consumption, conserving water and other natural resources, increasing the efficiency of energy usage, recycling materials, and developing and adopting renewable sources of energy.^{4,5,6,7}

Broadly defined, the green economy describes both: 1) products and services, as well as 2) business practices and processes that dramatically reduce the demand for energy and increase the efficient use of resources. Businesses that produce green products or provide green services constitute the supply side of the emerging green economy, while companies and consumers that adopt sustainable practices make up the demand side of the green economy. When evaluating the demand for green jobs the analysis would not be complete unless it included both the supply and

² McGraw Hill Study, “2009 Greening of Corporate America”, Siemens Building Technologies Inc and McGraw-Hill Construction

³ World Commission on Environment and Development report chaired by Gro Harlem Brundtland, titled “*Our Common Future*”, 1987, p.40

⁴ National Center for O*Net Development, “*Greening of the World of Work: Implications for O*NET®-SOC and New and Emerging Occupations*”, February 12, 2009

⁵ PEW Charitable Trusts, “*The Clean Energy Economy: Repowering Jobs, Businesses, and Investment Across America*”, June 2009

⁶ Clean Technology, Wikipedia, Retrieved May 13, 2008, http://en.wikipedia.org/wiki/Clean_technology

⁷ Cleantech Group, LLC, <http://cleantech.com/about/cleantechdefinition.cfm>

demand components. Without customers buying green goods and services there would be no green economy. Therefore green business practices are an essential component of the green economy.

In estimating the number of green jobs, the Bureau of Labor Statistics uses two approaches: (1) an *output approach*, which identifies establishments that produce green goods or provides green services and counts the associated jobs; and (2) a *process approach*, which identifies establishments that use environmentally friendly production processes and business practices and counts the associated jobs.

According to this criterion a **green business** can be any organization that 1) incorporates the principles of sustainability into its business practices to ensure that all processes and manufacturing activities are environmentally friendly, and/or 2) produces goods or provides services that utilize resources more efficiently, provide renewable sources of energy, lower greenhouse gas emissions, or otherwise minimize their environmental impact.

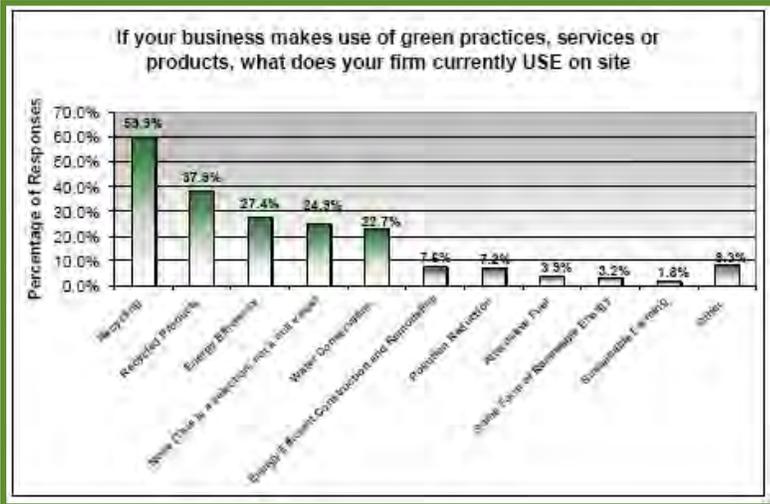
Green Business Practices

Sustainable business practices help generate the demand for green products and services. While technology innovation is enabling the transformation to a greener economy, businesses in general are adopting green practices (defined as activities that reduce energy and resource consumption and/or improve environmental quality) as part of their standard operating procedures. Surveys indicate that green business practices are becoming more widespread across both green and traditional business sectors. While green technology companies are busy innovating new green products and services, traditional businesses are changing the way they operate to become more energy efficient or environmentally responsible.

Under this criterion the emphasis is placed on the firm's internal operations rather than on its output. Businesses producing conventional products can become green by adopting the principles of sustainability and revising their processes to conserve resources and reduce pollution and greenhouse gas emissions.

By adopting green business practices businesses can improve their environmental performance while enhancing their bottom line. Unfortunately, there is no single definition or standard of what constitutes green business practices. A business can claim to be green as long as they are taking steps to reduce their carbon footprint, decrease pollution and greenhouse gas emissions, recycle, use of

"Green business practices lead to a better work environment; a healthier workforce; more customers; and an increase in the bottom line"



Source: EDD California Green Economy, April 21, 2010

environmentally friendly cleaning products, conserve energy, or use renewable sources of energy. Third-party verification of green business practices validates a company's claims that it has achieved a certain level of compliance and/or met the standards established by a credible third-party organization. A wide variety of green business certification programs have been established and are in use throughout the United States which vary in cost, credibility, and criteria. Some green business certifications can be little more than "green-washing", while other certifications may focus only on a narrow area and do not address general business practices. Therefore, it is important to select reputable certification programs that are relevant to a specific business or industry.

Green Products & Services

At the heart of the green economy are companies involved in the production of goods and provision of services *"that enable the transformation toward a cleaner, more efficient, and more competitive economy."* The core green economy can be divided into various sectors including clean technology (or cleantech), clean energy, green building, and traditional environmental services and technologies such as air pollution control, remediation, and hazardous waste management. Technological innovations are driving many of the activities that comprise the green economy, such as solar PV, electric cars, biofuels, smart grid, and wind turbines. New green technology spans a broad range of products, services and processes that lower performance costs, reduce or eliminate negative ecological impact, and improve the productive and responsible use of natural resources.⁸

In identifying companies that produce green goods and provide green services the Bureau of Labor Statistics has identified 333 industries (using 6-digit NAICS categories) where these companies can be found. A copy of the industry list is included in the Appendix. The NAICS classification system is a production-oriented framework where establishments are grouped into industries based on the similarity in the processes they use to produce goods or provide services. While this industry list is helpful in identifying establishments that actually produce green goods and provide green services, not all establishments within any given industry produce green products or provide green services. A market-oriented classification system which groups businesses based on their selling similar products or services is more efficient when evaluating the labor market and job opportunities with companies producing green products and services.

Green Market Segments

Companies producing green products and providing green services cover a number of different market segments that have been described by the Cleantech Group, New Energy Finance, Environmental Business International, US Green Building Council, Next 10, and others. The various taxonomies (see Appendix) identify clean technology, clean energy, green building, and environmental technologies, and other sectors that make up the Green Economy. The Cleantech Group™ describes cleantech as *"new technology, processes, and business models, spanning a range of industries that enhance efficiency, reduce or eliminate negative ecological impact, and*

⁸ Creating The California Cleantech Cluster: How Innovation and Investment Can Promote Job Growth and a Healthy Environment, Natural Resource Defense Council and Environmental Entrepreneurs, September 2004

improve the productive and responsible use of natural resources. The Cleantech Group has developed a taxonomy of the cleantech sector consisting of eleven market segments.

Next 10, a non-profit research organization, conducted a study of California's Green Economy that documented the transformation of the state's economy away from one based on fossil fuels and waste to one based on clean fuels and the efficient use of all resources. The Study defined a core green economy broken down into fifteen market segments (see Appendix). Many of these market segments were based on the eleven Cleantech segments originally defined by the Cleantech Group and expanded to include Green Building, Finance & Investment, Research & Advocacy, and Business Services.

The various market segments identified above have been incorporated into the following green market segments that include clean technology, green building, and service providers.

Table 1:
Green Market Segments

<i>Technology/Product/Service</i>	
Clean Technology	<p>1. Energy Generation (clean, renewable, alternative)</p> <ul style="list-style-type: none"> ▪ Wind ▪ Solar ▪ Hydro ▪ Marine (Tidal, Wave, Current) ▪ Biofuels ▪ Geothermal ▪ Waste-to-Energy ▪ Other (Co-generation, Hydrogen) ▪ Equipment & component parts (generators, controls, inverters, Turbines, etc)
	<p>2. Energy Storage</p> <ul style="list-style-type: none"> ▪ Fuel Cells ▪ Advanced Batteries ▪ Hybrid Systems
	<p>3. Energy Infrastructure</p> <ul style="list-style-type: none"> ▪ Advanced Batteries ▪ Management ▪ Transmission ▪ Controls ▪ Integrated Electronic Systems for Management ▪ Smart Grid ▪ Energy Smart Technologies
	<p>4. Energy Efficiency</p> <ul style="list-style-type: none"> ▪ Lighting ▪ HVAC ▪ Glass ▪ Sensors & Diagnostic Equipment ▪ Appliances ▪ Motors, Machinery, Compressors ▪ Related Equipment & Controls
	<p>5. Transportation</p> <ul style="list-style-type: none"> ▪ Energy Efficient Vehicles ▪ Logistics (RFID, GPS) ▪ Mass Transportation ▪ Automated Toll Collection ▪ Road Pricing Systems ▪ Alternative Fuels (biofuels, hydrogen, etc.)
	<p>6. Water & Wastewater</p> <ul style="list-style-type: none"> ▪ Water Treatment ▪ Water Conservation Products & Services ▪ Wastewater Treatment ▪ Desalinization ▪ Water Purification Products & Services
	<p>7. Air & Environment</p> <ul style="list-style-type: none"> ▪ Cleanup/Safety ▪ Emissions Control ▪ Monitoring/Compliance ▪ Trading & Offsets ▪ Carbon Capture & Storage
	<p>8. Advanced Materials</p> <ul style="list-style-type: none"> ▪ Bio-based ▪ Nanotechnology ▪ Chemical ▪ Recycled Materials & Products ▪ Environmentally-benign Chemicals (lubricants, solvents, etc)

	<p>9. Manufacturing/Industrial</p> <ul style="list-style-type: none"> ▪ Advanced Packaging ▪ Monitoring & Control ▪ Smart Production ▪ Advanced Materials ▪ Environmental Equipment 	<ul style="list-style-type: none"> ▪ Water Equipment ▪ Instruments & Information Systems ▪ Air Pollution Control Equipment ▪ Waste Management Equipment ▪ Process & Prevention Technology
	<p>10. Agriculture</p> <ul style="list-style-type: none"> ▪ Natural Pesticides ▪ Land Management ▪ Aquaculture 	<ul style="list-style-type: none"> ▪ Irrigation ▪ Precision Agriculture
	<p>11. Recycling & Waste</p> <ul style="list-style-type: none"> ▪ Recycling ▪ Waste Treatment 	
Green Building	<p>12. Green Building</p> <ul style="list-style-type: none"> ▪ Residential ▪ Commercial ▪ Remodeling ▪ Institutional ▪ Governmental 	<p><u>Service Providers</u></p> <ul style="list-style-type: none"> ▪ Architects & Engineers ▪ Green Building Consultants ▪ General Contractors ▪ Specialty Trades Contractors ▪ Builders/Developers ▪ Solar Energy System Contractors ▪ Systems Integrators
	<p>13. Green Building Materials</p> <ul style="list-style-type: none"> ▪ Energy & Water Efficient Products/Systems ▪ Insulation for Glass & Walls ▪ Products Made from Recycled Materials 	<ul style="list-style-type: none"> ▪ Certified Wood Products ▪ Low/Non VOC Sealants & Caulking, Paints, Flooring, Carpets, etc ▪ Fly Ash Construction Brick ▪ Other
Service Providers	<p>14. Environmental Services</p> <ul style="list-style-type: none"> ▪ Environmental Testing & Analysis ▪ Wastewater Treatment Works ▪ Solid Waste Management 	<ul style="list-style-type: none"> ▪ Hazardous Waste Management ▪ Remediation/Industrial Services ▪ Environmental Consulting & Engineering ▪ GHG Emissions
	<p>15. Research, Design, & Consulting</p> <ul style="list-style-type: none"> ▪ Energy Auditors ▪ Trading & Offsets 	
	<p>16. Finance & Investment</p> <ul style="list-style-type: none"> ▪ Energy Trading ▪ Carbon Trading & Offsets ▪ Project Financing 	
	<p>17. Distributors, Maintenance & Installation</p> <ul style="list-style-type: none"> ▪ Wholesalers/Distributors ▪ Sales/Installation 	<ul style="list-style-type: none"> ▪ Repair/Maintenance ▪ Systems Integrators ▪ Solar Installers ▪ Wind Turbine Refurbishing

Source: Cleantech Group LLC, Guide to the Cleantech Index v4.0 - January 2009, <http://cleantech.com/about/cleantechdefinition.cfm>
 New Energy Finance, <http://www.newenergyfinance.com/markets/clean-energy/>
 Environmental Business International Inc, <http://www.ebiusa.com/Segments.html>
 U.S. Green Building Council, http://www.pa-greenbuildingproducts.org/market_opportunity_for_green.aspx
<http://www.buildinggreen.com/auth/article.cfm/2000/1/1/Building-Materials-What-Makes-a-Product-Green/>
 National Center for O*Net Development, "Greening of the World of Work: Implications for O*NET®-SOC and New and Emerging Occupations", February 12, 2009
 Next 10, "Many Shades of Green: Diversity and Distribution of California's Green Jobs", December 2009

NAPA COUNTY'S GREEN BUSINESSES

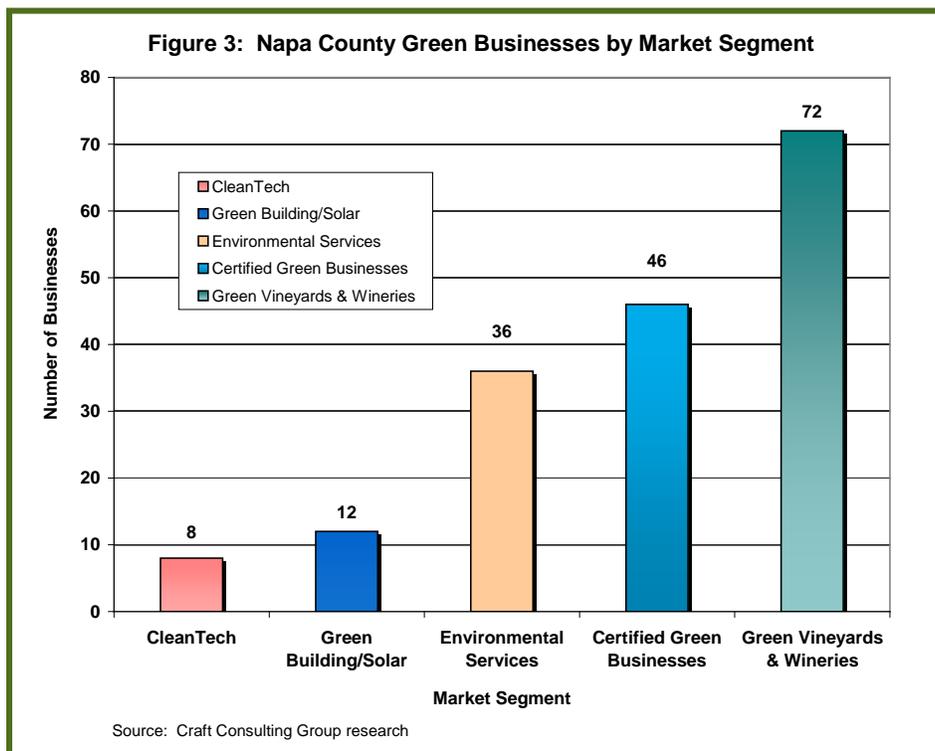
Industry Cluster Analysis

Napa County's emerging green economy complements the county's existing economic base with several sectors producing green products and/or services and companies across a broad array of industry sectors adopting green business practices. The County's emerging green economy holds the promise of new business opportunities and green job creation in traditional businesses as well as emerging companies offering new green products or services.

Number and Type of Green Businesses

Our research identified 174 green businesses located in Napa County spread across several green market segments. Green product and service businesses comprise 1.2% of all business in Napa County. This compares favorably with the nation (0.9%) and state (1.0%). Candidate companies were identified and qualified according to the criteria described in the previous section. A database was then developed with green businesses falling into one of the following market segments:

- Cleantech
- Green Building/Solar
- Solution Providers (Environmental Services, Waste Mgt, Remediation Engineering)
- Green Vineyards & Wineries
- Certified Green Businesses

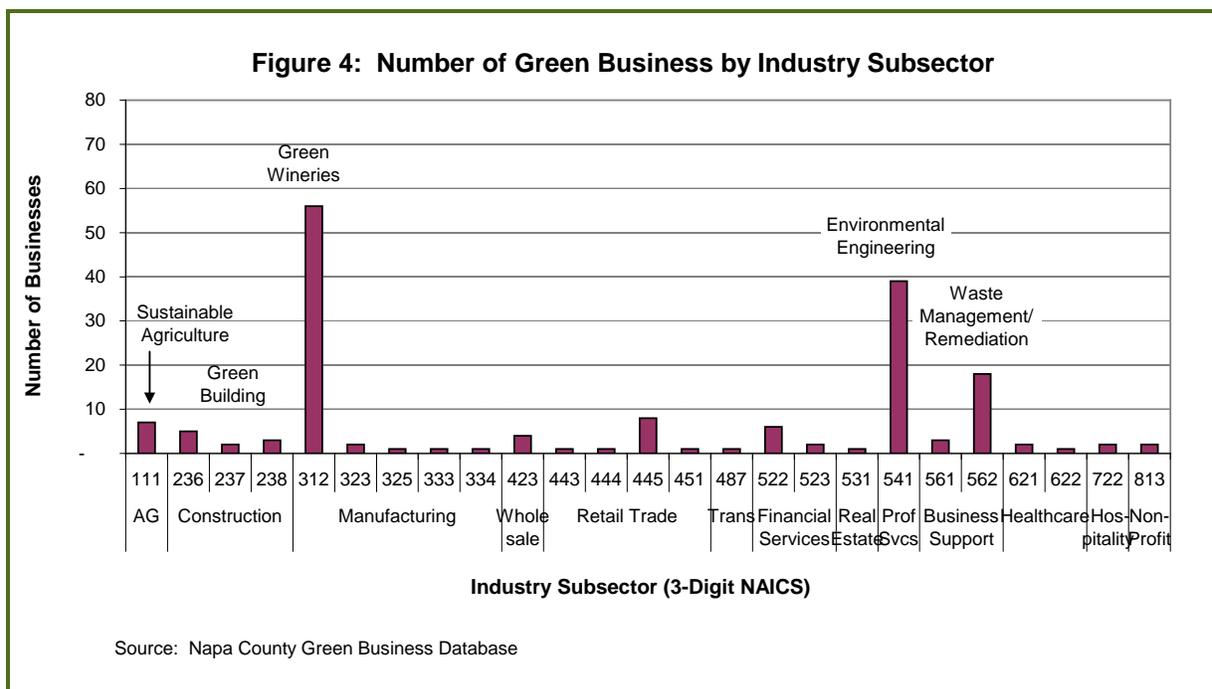


As with the overall economy, the wine industry plays a leading role in Napa County's emerging green economy. Green vineyards and wineries include those who have adopted green business practices as well as those who produce organic wines. Certified Green Businesses include companies across all industry sectors that have adopted green business practices and are certified under the County's Green Business Program. Many of the certified green businesses also fall into more than one market segment. For the purpose of this study, to avoid duplication, companies that had adopted green business practices and also produced green products and/or services were listed in that category and not also listed in the certified green business category. (For a complete list of certified green businesses in Napa and other Bay Area Counties, see the Bay Area Green Business Program at <http://www.greenbiz.ca.gov/ShopGreen.html>). Green Vineyards and Wineries were listed only in that category. All companies that have adopted green business practices are discussed in the following section on green business practices below. A number of green builders located throughout the North Bay and doing business in Napa County were not included since they do not have a place of business within Napa County.

The largest numbers of green businesses fall into three major industry sectors based on their NAICS code classification:

- NAICS 312 Manufacturing (Wineries)
- NAICS 541 Professional Services (Environmental Engineering)
- NAICS 562 Business Support (Waste Management/Remediation)

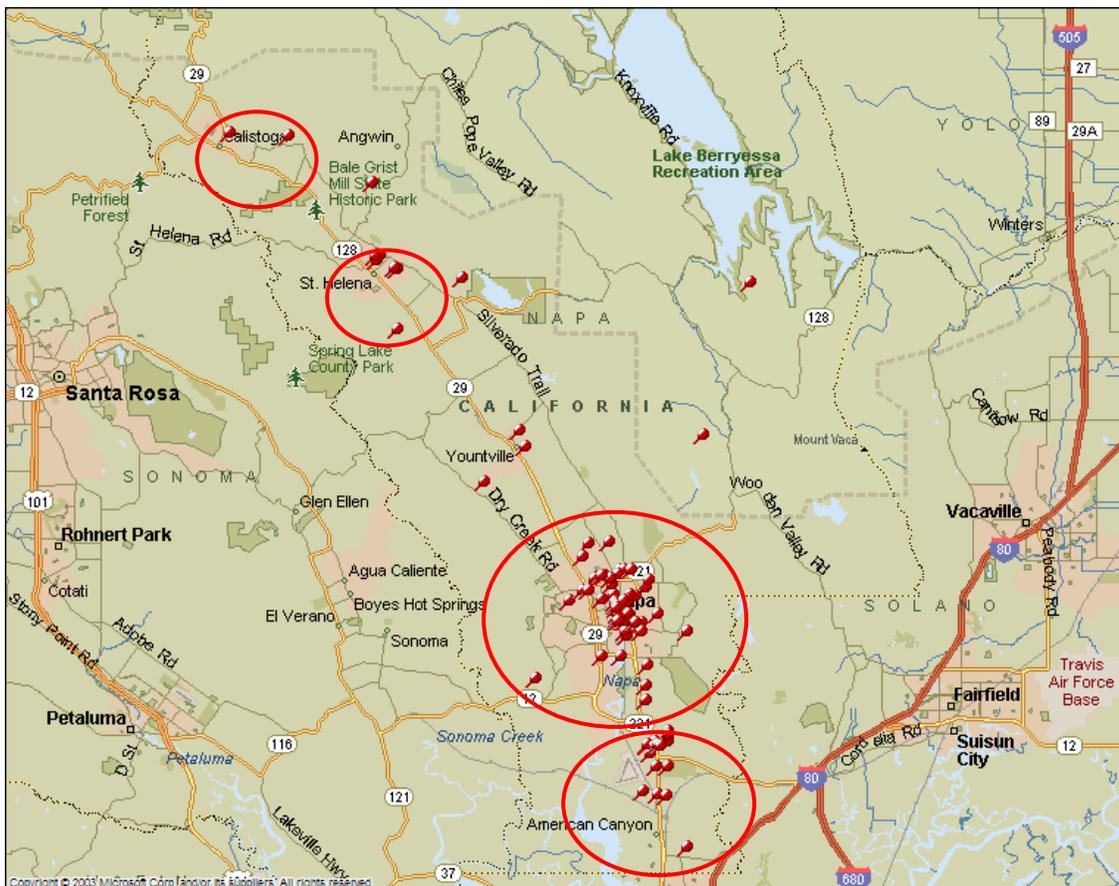
Construction firms involved in Green Building make-up the fourth largest industry sector. The fifth largest industry sector is vineyards which employ sustainable agriculture practices but do not manufacture wine. These are classified under the agriculture industry. The remaining firms are certified green businesses spread across a number of industry subsectors.



Geographic Location of Green Businesses

Almost two-thirds of the green businesses are located in the City of Napa (62.5%) followed by St. Helena (17.9) a distance second, and Calistoga (6.5%) with the third largest number of green businesses. A small number of green businesses are also located in Rutherford (4.9%), Oakville (3.3%), American Canyon (2.2%), and Yountville (1.6%). Broken down by market segment, the City of Napa has the majority of green businesses including cleantech firms (62.5%), green building (93.3%), environmental engineering (82.6%), remediation (77.8%), and certified green businesses (78.4%). St. Helena has the largest number of green wineries (32.4%), followed by the City of Napa (27%), Calistoga (13.5%), Rutherford (10.8%), and Oakville (8.1%). American Canyon has a number of environmental engineering and remediation firms and Yountville has several cleantech firms. American Canyon has the distinction of being Napa County's second largest city, but the city with the fewest green businesses per capita.

Figure 5: Geographic Location of Green Businesses in Napa County



Distribution of Green Businesses by Size of Firm

Almost 95% of the green businesses are small firms with fewer than 100 employees. Most of the cleantech, environmental engineering, green building, and certified green businesses are small firms. Green businesses with the largest number of employees include green wineries and remediation firms.

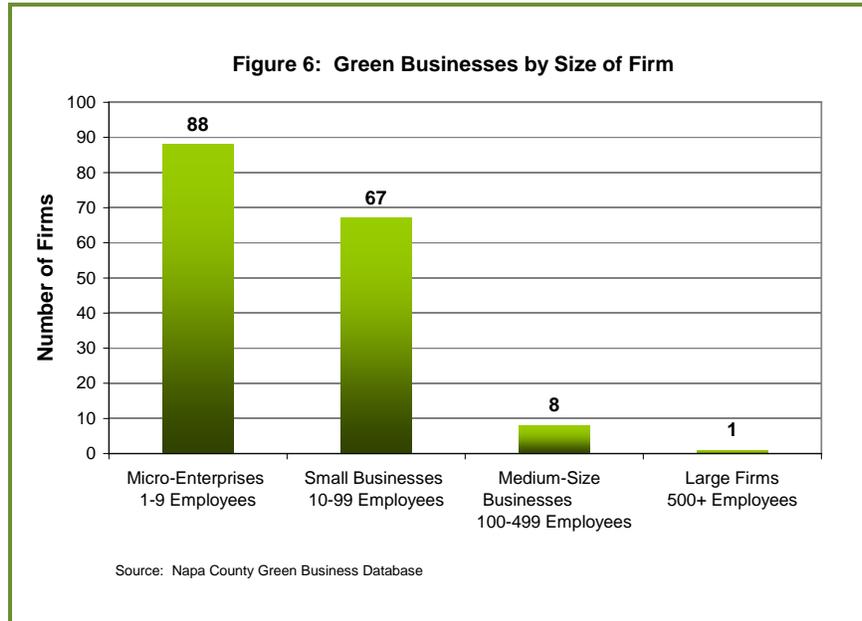


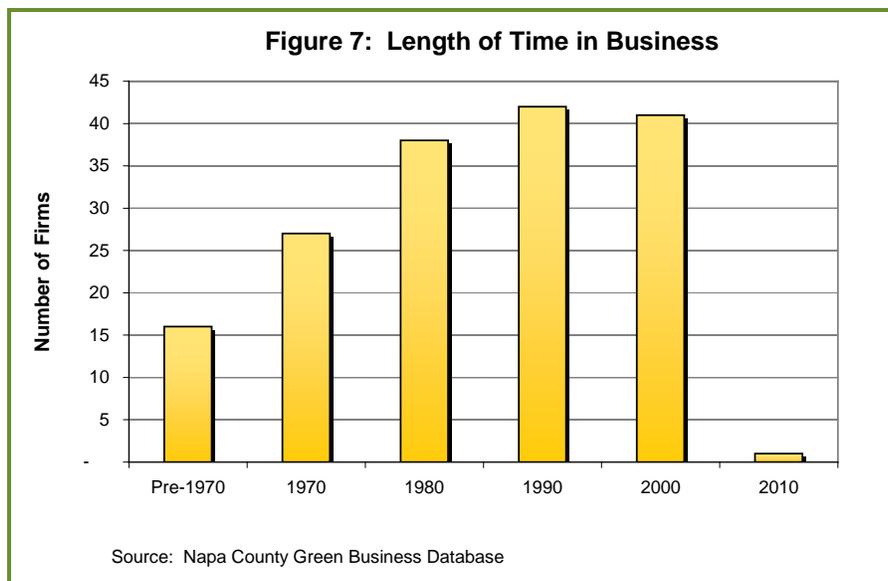
Table 2: Major Green Business Employers in Napa County

Employer	# Employees	Industry Sector
Envirocare International	15	Cleantech
Thern Electric	8	Green Building
Solar Knights	5	Green Building
Napa Recycling & Waste Services LLC	100	Remediation/Waste Management
Robert Mondavi Winery	100	Green Winery
Hess Collection Winery	120	Green Winery
V.Sattui Winery	150	Green Winery
Charles Krug	150	Green Winery
Rubicon Estate	200	Green Winery
Beringer Vineyard & Winery	500	Green Winery

Source: Napa County Green Business Database

Length of Time in Business

Seventy-five percent of the green businesses have been in existence for ten or more years. This is a reflection in part of the number of businesses providing green products and services versus the number of traditional businesses that have adopted green business practices. Many of the businesses providing green products and services include engineering and environmental service firms that have been in business for many years and recently added green services. Only 15% of the businesses providing green goods and services were started within the past ten years. The Bay Area Green Business Program of which Napa County is a participating partner was launched in 1996. The Napa Green Certified Winery Program (developed by the Napa Valley Vintners in coordination with the Napa County Department of Environmental Management) was established in 2007. Both of these certified green business programs have grown substantially in size since they were founded with a growing list of participating businesses.



Green Employment in Goods-Producing & Service-Providing Sectors

Almost 50% of the green businesses identified in this study produce green products or provide green services. Of these firms, nearly 34% are goods producing with the largest number of firms in the green building sector. Nine of the goods producing firms produce organic wines. This does not include the green wineries that have adopted green business practices, but do not produce organic wine. Firms providing environmental and remediation services make-up the largest number of service firms, followed by waste management service firms which also employ the largest number of workers.

Goods Producing	# Firms	# Jobs	Service Providing	# Firms	# Jobs
Cleantech	8	10	Environmental/Engineering Services	36	159
Green Building	12	103	Recycling/Waste Management	18	306
Organic Wines	9	116	Research & Sustainability Consulting	2	2

Green Business Practices

Over the past decade, organizations of all sizes in nearly every industry sector have started to adopt green business practices. Large corporations have launched sustainability initiatives to reduce their carbon footprint, minimize waste, and green their supply chain. Small businesses have cut costs by adopting energy efficiency measures, recycling, and cutting back on excess consumption of office supplies. Many businesses also have hired or appointed staff to oversee company-wide sustainability programs. An organization's motivations are likely to include cost savings, increased revenue, reduced liabilities, improved community relations, and enhanced corporate image. Bolstered by the business value that can be derived from reducing waste and maximizing resource efficiency, companies are beginning to use less packaging material, eliminate or reduce hazardous substances, and promote end-of-life recycling as standard business practices. Businesses will likely adopt green business practices when it improves their bottom line and demonstrates a return on their investment.

A study by Arthur D. Little, a management consulting firm, found that “companies that are able to derive value from sustainability . . . will outperform their peers financially in the long run. . . . By transforming their products, processes and operations in line with long-term environmental requirements, using resources efficiently and taking action to reduce both direct and indirect CO2 emissions, companies can cut waste, increase efficiency, improve their utilization of resources, reduce costs and reduce risk.”⁹

Certified Green Businesses

For those businesses that have a need and/or desire to become certified, there are many green business certification programs that have been established throughout the United States. Some green business programs certify a variety of business types while others are industry-specific. Requirements for certification vary according to the program and certifying organization.

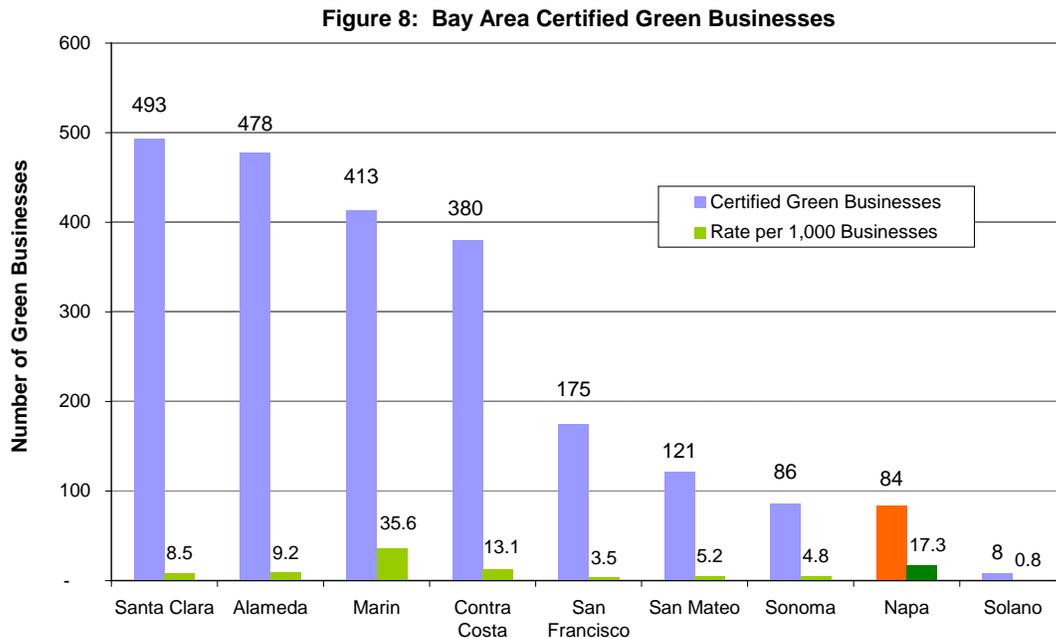
The Association of Bay Area Governments (ABAG) has developed a Bay Area certified green business program that is managed by individual county coordinators. The program verifies that local businesses comply with all relevant environmental regulations and have taken actions beyond regulatory compliance to conserve resources, prevent pollution, minimize waste, and reduce their carbon footprint.

Napa County has adopted a certified green business and winery program that is affiliated with ABAG's Green Business Program and the Napa Green Certified Winery and Land program developed by Napa Valley Vintners. The certified green business and winery programs are coordinated by the County's Environmental Management Department which is responsible for providing information and technical assistance to local businesses, assisting them in complying with environmental regulations, and going beyond compliance to adopt voluntary standards in four areas: energy-efficiency; water conservation; pollution prevention; and solid and hazardous waste reduction and recycling. Enrollment in the programs are free. Information can be found at www.countyofnapa.org, or by contacting the Napa County Department of Environmental Management.

⁹ Arthur D. Little, “Sustainable Performance: A Case of the Emperor's New Clothes?”, June 2008, p.2

There are 84 certified green businesses in Napa County. In comparison with other Bay Area counties, Napa County ranks 8th in terms of the total number of certified green businesses. However, Napa County's economy is relatively small compared to the total number of businesses in other Bay Area counties. Taking into consideration the size of each county's economy, Napa County would rank second after Marin County due to its smaller size.

Certified green businesses currently make-up 1.8% of Napa County's total private sector businesses. As more businesses adopt sustainability initiatives or become certified, they will help drive the demand for green products and services. Increased demand in turn will stimulate job growth in companies producing green products and services.



Source: Bay Area Certified Green Business Program - December 2010

Sustainable Agriculture Practices and Certified Green Wineries

Sustainable agriculture covers a variety of environmentally-friendly farming practices including organic and biodynamic viticulture. Sustainable winegrowing follows practices that are economically viable, socially responsible and environmentally sound with goals of optimizing vineyard ecology, reducing pesticide use, and promoting soil health.

Organic Wines and Vineyards

Organic vineyards means that no chemicals can be used in the vineyard—no chemical fertilizers, weed killers or insecticides. The only substance that can be used is elemental sulfur, which is organic itself and is used to prevent powdery mildew in the fields.

Over 1,200 acres of vineyards in the Napa Valley are currently certified organic. An unknown quantity of additional acreage is being farmed organically but without certification.

Organic wine is wine made from organically grown grapes and that is also free from chemicals during the actual winemaking process. Current federal law states that an organic wine cannot be subjected to sulfur dioxide during its fermentation process. However, it is legal to use elemental sulfur in the vineyard. Organic wines carry a phrase such as "Wine made from organically grown grapes" on the back label.

Biodynamic Viticulture

A growing number of vineyards in the Napa Valley are not only organic but also biodynamic. This is a method of farming that was proposed by Austrian scientist and metaphysician Rudolf Steiner in the 1920s. Biodynamics considers the health of the soil and the use of homeopathic solutions to energize the vitality of the soil.

Various programs exist to certify green farming practices including Napa Green, California Sustainable Winegrowing Alliance, and California Certified Organic Farmers.

Napa Green

Napa Green is a voluntary program developed by the Napa Valley Vintners that is open to all vintners and grape growers in the county interested in sustainable agriculture and winemaking practices. Napa Green focuses on building environmentally sound, sustainable practices that meet and exceed more than twenty local, state and federal land or production "best practices" and is certified by an independent third party. Napa County vintners participate in programs focused on winery operations and/or farming practices tailored specifically to each property to meet and exceed environmental compliance and continue to protect and enhance the ecological quality of the region. Under the Napa Green certification programs, vintners and grape growers can enroll in the green certified land or green certified winery programs.

Napa Green Certified Land - is a third party certified, voluntary program that seeks to restore, protect and enhance the county's watershed and restore habitat. The program includes not only farm and vineyard land, but also non-farmed and wild land, roadways, stream banks, drainage and more within a specific property. The certification is in partnership with Fish Friendly Farming, National Marine Fisheries Service, the Napa County Department of Agriculture's Department of Pesticide Regulation, and the Regional Water Quality Control Board, among others.

To date almost 45,000 acres are enrolled in the program with 21,000-plus acres certified. The goals and objectives of the program are to:

- Ensure compliance with all local, state and federal environmental regulations including the Clean Water Act, Endangered Species Act, California Department of Fish and Game code, and county conservation regulations;
- Implement beneficial management practices and promote sustainable agriculture and ecosystems;
- Improve water quality and aquatic habitat; and
- Implement restoration and soil erosion control projects.

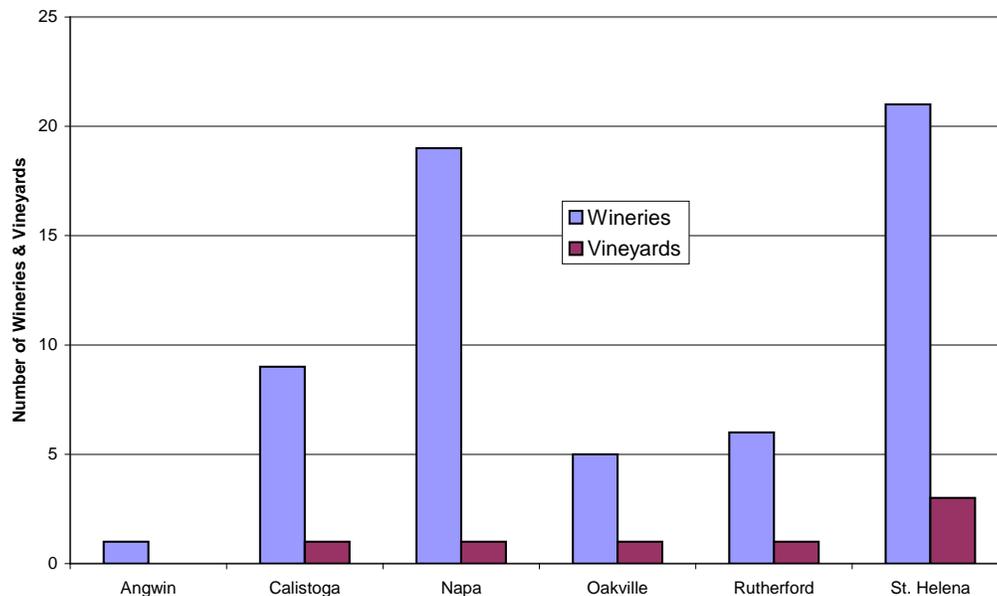
Napa Green Certified Winery - as a complement to Napa Green Certified Land, the Napa Valley Vintners developed a companion program for Napa Valley's winery production facilities. The Napa Green Certified Winery program continues the sustainable practices from the vineyard and land through the winemaking process in the wineries.

Napa Green Certified Winery is a Napa-specific set of sustainable and green business practices for wineries. Certified green wineries demonstrate a commitment to conserving water and energy, reducing waste, and preventing pollution. The efforts of Napa Green Certified Winery are aimed at reducing the carbon footprint of wine production facilities as part of the broader view of excellent business practices. Certification goes beyond compliance, meeting or exceeding environmental regulations related to winery operations and helps wineries become more sustainable through economically viable, environmentally sensitive and socially equitable practices.

The Napa Green Certified Winery program was developed by the Napa Valley Vintners in coordination with the Napa County Department of Environmental Management based on the Association of Bay Area Government's Green Business Program. ABAG's winery-specific checklist was updated and adopted as the certification method for Napa Green Certified Winery because it puts all the regulatory pieces into a comprehensive format that goes beyond compliance.

Napa Valley Vintners is a non-profit trade association responsible for promoting and protecting the Napa Valley appellation as the premier winegrowing region. The association represents nearly 400 Napa Valley wineries.

Figure 9: Green Wineries & Vineyards



Source: Napa Green, Napa County Certified Green Business Program, California Sustainable Winegrowing Alliance

California Sustainable Winegrowing Alliance

A number of Napa County wine growers are members of the California Sustainable Winegrowing Alliance and have been certified by CSWA's Certified California Sustainable Winegrowing (CCSW) program. A survey conducted by the University of California, Davis for a CSWA report ¹⁰ funded by the National Fish and Wildlife Foundation (NFWF) revealed that 101 winegrowers throughout California have adopted sustainable vineyard management practices. About 60% of the 101 winegrowers that were surveyed reported using 10 or more of the 16 environmentally friendly farming practices included in the study. The six most-used practices, adopted by 80% or more of the growers, include:

- regular monitoring of pest insects and/or diseases;
- use of reduced risk pesticides;
- reduced tillage or no-till approaches;
- conservation of natural vegetation on vineyard property;
- leaf pulling; and
- planting cover crops in the vineyard.

There are a variety of reasons growers have adopted sustainable vineyard practices. While environmental concerns are common, the economic benefits are also important. Monitoring water use; planting cover crops; and reducing tillage are all associated with significant cost savings. Many growers are interested in sustainable practices such as integrated pest management and energy efficiency, but feel constrained by lack of knowledge and experience.

Almost half of the growers surveyed expressed an interest in adopting alternative energy sources such as solar or wind powered systems, but high capital costs and potentially long payback periods are mentioned as deterrents.

Napa Chamber of Commerce Green Business Program

The Napa Chamber of Commerce recognizes and promotes chamber members that have adopted green business practices. The Napa Chamber's Green Business Program recognizes three categories of green businesses in their business directory:

Green Certified Businesses: Chamber members that have completed a Green Certification program. Green Certified Businesses have been certified through the Bay Area Green Business Program and other acknowledged certification programs.

LEED Accredited Professional: LEED AP (Accredited Professional) credentials recognizes green building design, construction, and operation professionals that have demonstrated a thorough understanding of green building practices and principles based on the U.S. Green Building Council's LEED Rating System. The Green Building Certification Institute (GBCI) is an independent, third-party organization established in 2008 to administer green building practice professional credentials and certificates within the framework of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) Green Building Rating Systems™.

¹⁰ California Sustainable Winegrowing Alliance, "Understanding Adoption and Impacts of Sustainable Practices: Sustainable Winegrowing Program Participants' Survey", October 2009, www.sustainablewinegrowing.org.

Green Minded Businesses – acknowledges chamber members that have incorporated some level of green business practices as part of their business operation and are taking steps to conserve natural resources and prevent pollution, such as using more efficient lighting, purchasing in bulk, using organic products, watering landscapes efficiently, recycling cardboard, using less toxic products, etc.

The Napa Chamber recognizes 46 green certified businesses, 5 LEED Accredited Professionals, and 80 green minded businesses that are chamber members.

GREEN JOBS & OCCUPATIONS

Workforce Analysis

Green Jobs

Green jobs are broadly defined as jobs that involve protecting wildlife or ecosystems, reducing pollution or waste, reducing energy usage or lowering carbon emissions. Green jobs involve work in a wide range of industries, market segments, and occupations.

According to the Workforce Information Council, an advisory group of state and federal employment officials, “a *green job is one in which the work is essential to products or services that improve energy efficiency, expand the use of renewable energy, or support environmental sustainability. The job involves work in any of these green economic activity categories:*”¹¹

- *Renewable Energy and Alternative Fuels*
- *Energy Efficiency and Conservation*
- *Pollution, Waste, and Greenhouse Gas (GHG) Management, Prevention, and Reduction*
- *Environmental Cleanup and Remediation and Waste Clean-up and Mitigation*
- *Sustainable Agriculture and Natural Resource Conservation*
- *Education, Regulation, Compliance, Public Awareness, and Training and Energy Trading*

This definition implies that there is an important and significant link to green products and services. This is rather limiting since a chief sustainability officer in a conventional business utilizing green business practices would not be included. Although the definition of a green job focuses on the job as the unit of measurement, it can be related to a Standard Occupational Classification (SOC) occupational category or a NAICS industry classification.

The Bureau of Labor Statistics has developed a definition of green jobs for use in two planned surveys, which defines green jobs as either:

- A. Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources; or
- B. Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.

The BLS will use this definition of green jobs in two upcoming surveys, a green goods and services survey and a green process survey, both of which will be published in the Spring and Summer of 2012.

¹¹ Workforce Information Council, Green Jobs Study Group Final Report, “*Measurement and Analysis of Employment in the Green Economy*”, October 1, 2009

The BLS definition of green jobs is based on the environmental impact of the good or service produced or the production process used, not on skill differences required for the job. In contrast, the National Center for O*NET Development takes an occupational approach which examines how the green economy will affect occupational requirements and demand. The greening of occupations is defined as: "...the extent to which green economy activities and technologies increase the demand for existing occupations, shape the work and worker requirements needed for occupational performance, or generate unique work and worker requirements."

The Occupational Information Network (O*NET) is the nation's primary source of occupational information and is under the sponsorship of the U.S. Department of Labor Employment and Training Administration (USDOL/ETA). Access to O*NET is available through O*NET OnLine - <http://online.onetcenter.org/>

Green Occupations

The evolution to a green economy will require workers with new knowledge, skills, and abilities. In order to understand the impact of green economic activities and technologies on the occupational requirements, the National Center for O*NET Development investigated the impact of green economy activities and technologies on existing occupations and new and emerging occupations. Results of the research led to the identification of green increased demand occupations, green enhanced skills occupations, and green new and emerging (N&E) occupations. These occupations are clearly identified in the O*NET database, although new and emerging occupations have been defined but have not yet been fully studied in terms of knowledge, skills, and abilities.

The green occupations identified by O*NET are listed in the Appendix and include:

Green Increased Demand Occupations: Increase in the employment demand for an existing occupation, but no significant changes in the work and worker requirements of the occupation. The work context may change, but the tasks themselves do not.

Green Enhanced Skills Occupations: Employment demand for the occupation may not change and the essential purposes of the occupation remain the same, but tasks, skills, knowledge, and external elements, such as credentials, have been altered resulting in a significant change to the work and worker requirements.

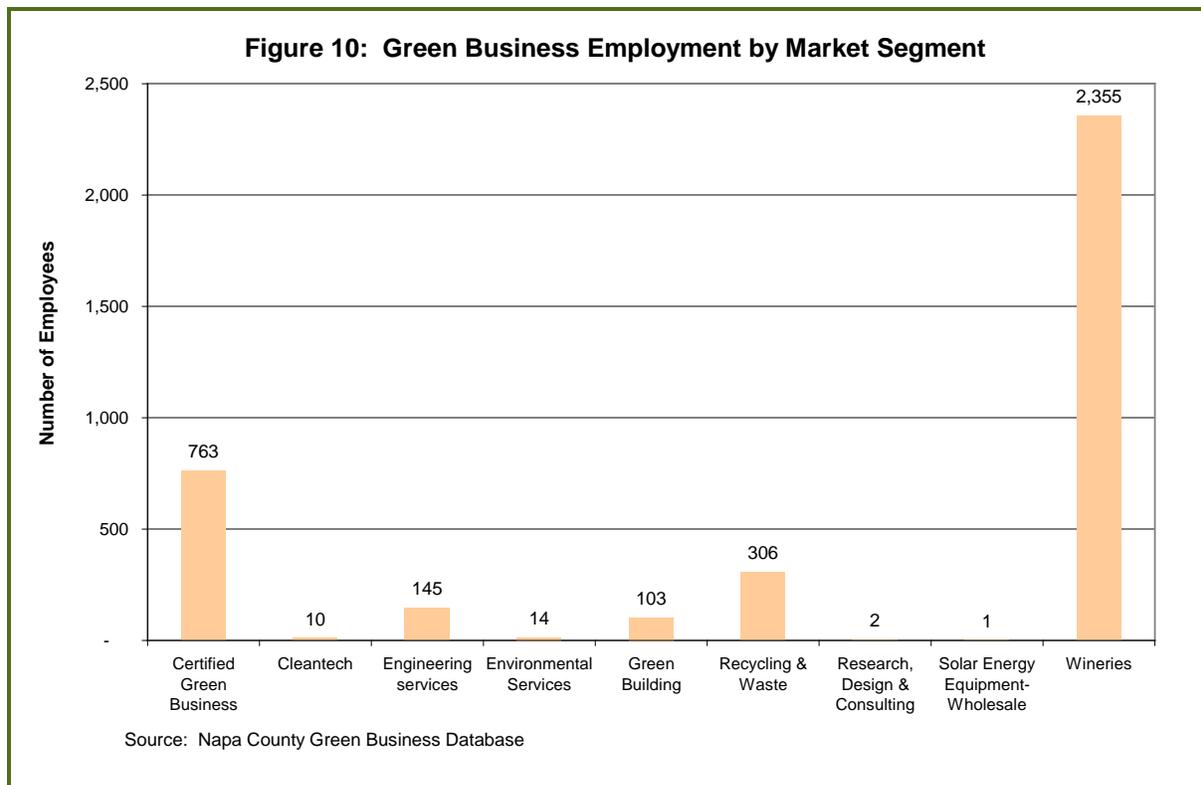
Green New and Emerging (N&E) Occupations: Unique work and worker requirements are created, which results in the generation of a new occupation with specialized skill requirements, knowledge, and tasks. This new occupation could be entirely novel or "born" from an existing occupation.

Green Employment

Employment by Market Segment

There are approximately 3,687 workers employed in Napa County green businesses. Employment in green businesses represents 5.4% of the total employment in the county. Employment in green businesses cuts across a broad range of industry sectors with manufacturing, business support, and hospitality sectors having the largest number. Employment in green businesses, however, does not imply all are green jobs.

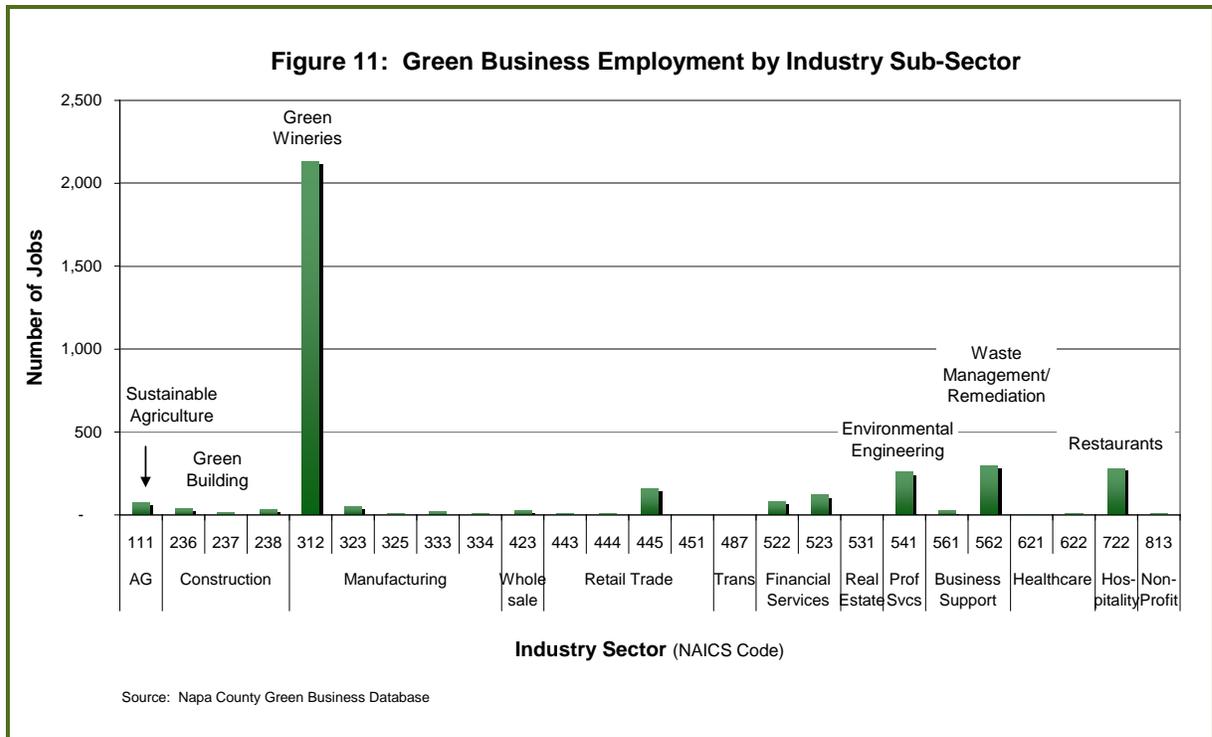
The largest numbers of jobs are in businesses utilizing green business practices and production processes including sustainable agriculture and green wineries and certified green businesses. Most of these jobs involve occupations where there is no significant change in the work or worker requirements. Jobs in companies employing green business practices represent approximately 5.3% of the total private sector jobs in Napa County. Jobs in businesses producing green products or providing green services account for approximately 1% of Napa County's total private sector jobs. This compares favorably with the Pew study of the nation's clean energy economy (0.7%) and Next 10's study of the state's core green economy (1.2%). A study¹² by the U.S. Department of Commerce of the nation's green economy (using a broader definition of green businesses) found that the number of green jobs "constituted between 1.5% and 2.0% of total private sector employment in 2007."



¹² U.S. Department of Commerce, Economics and Statistics Administration, "Measuring the Green Economy", April 2010

Employment by Industry Subsector

The breakdown of green jobs by industry subsector shows a similar profile to the number of green businesses, with green wineries, waste management/remediation, and environmental engineering sectors having the largest number of jobs. Certified green businesses in the hospitality sector also show strong employment, followed by retail trade and financial services. Most jobs in these sectors do not require any specialized knowledge or training.



Green Business Employer Survey

To better understand Napa County's green economy and workforce needs, a survey was conducted of local green businesses. Information from the survey provides valuable insight about the county's green employers and their workforce needs. The survey results are summarized in a series of tables and graphs below with accompanying narrative. A copy of the survey questionnaire is included in the Appendix.

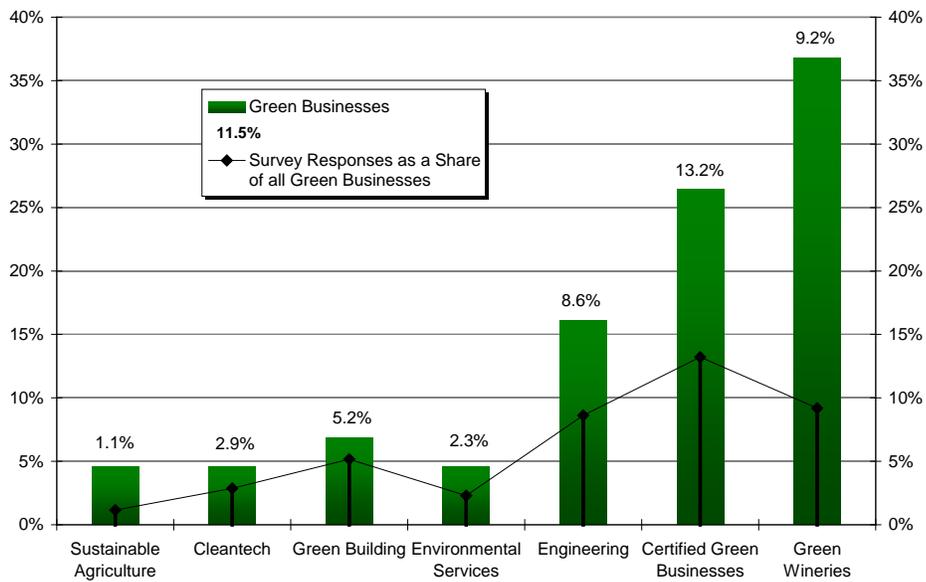
Green Businesses

The Respondents

Seventy-four (74) out of 184 green businesses responded to the survey for a 40% response rate. Nearly one-third of the businesses that responded were certified green businesses, followed by green wineries (21.6%), engineering firms (20.3%), and green building related companies (12.2%). Other types of green businesses responding to the survey included cleantech, environmental services, and sustainable agriculture. Survey respondents as a group employ over 1,975 employees in Napa County and range from single-person small businesses to companies with over 300 employees. Overall, only about one-third of the respondents produce green products or provide green services.

Although not a scientific sample, the respondents represent a reasonable cross-section of green employers in Napa County and the trends illustrated by the responses can be appropriately extrapolated beyond the respondents.

Figure 12: Green Business Survey Responses by Market Segment



Source: Napa County Green Business Data Base and Survey

Green Business Practices

Local green businesses employ a variety of green business practices from energy and water conservation to recycling with wide variation in the adoption rate. All of the green businesses surveyed had incorporated recycling as part of their standard operations. Green business practices, however, mean more than just recycling. Green business practices used by 80% or more of the companies surveyed include energy efficiency, environmentally-friendly purchasing, and water conservation. Low toxic cleaning supplies are used by 75% of the green businesses while 58% have adopted pollution prevention measures. Other common green business practices identified by the respondents include a range of activities from the use of energy efficient lighting and appliances, organic farming practices, alternative transportation, renewable energy (solar, wind, geothermal, and biodiesel), and rainwater catching systems.

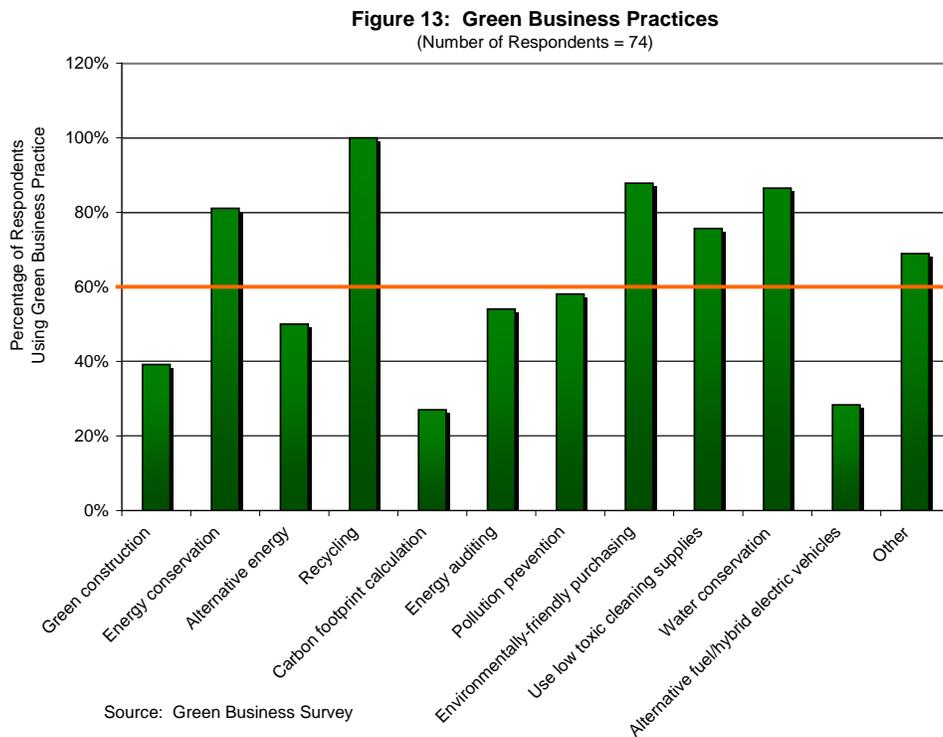


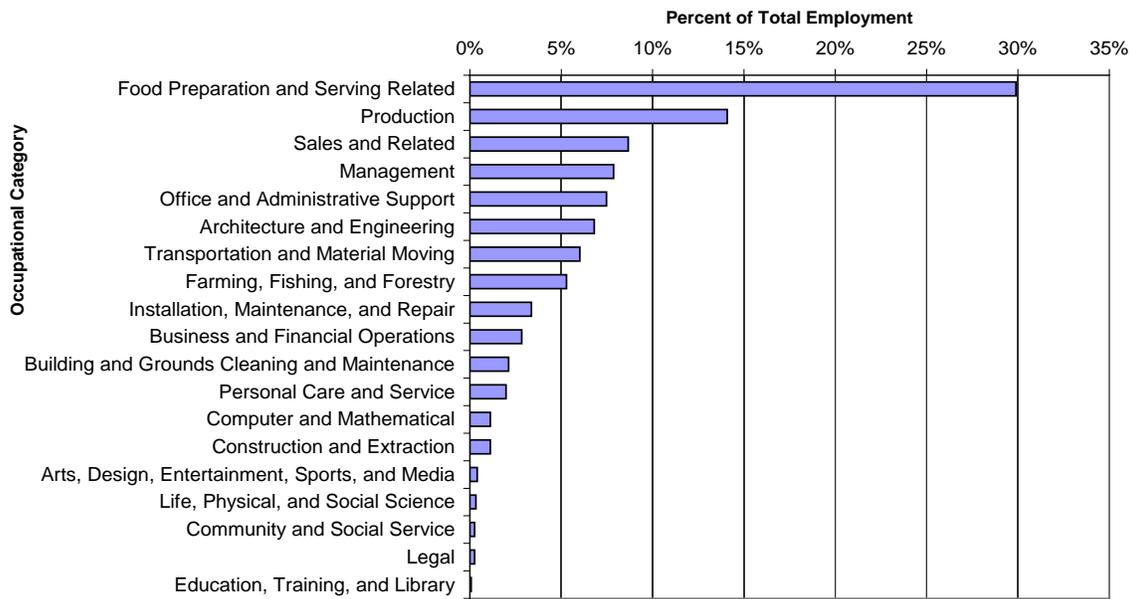
Table 4: Other Green Business Practices Mentioned

- Energy Efficient Lighting or Appliances
- Biofuels
- Composting
- Low VOC Paints, Caulking, Compounds
- Use/Purchase Recycle/Green Products
- Paperless
- Organic Farming Practices
- Bicycling to Work
- Rain Catching Systems

Occupational Profile

The occupational profile of the green businesses surveyed reflect a variety of standard occupations due to the fact that more than half of the respondents were certified green businesses spread across a number of industry sectors. Many of these occupations can be considered “green increased demand occupations” requiring no significant changes in the work and worker skills or requirements for the job. Several occupational categories involve “green enhanced skills occupations.” These include architecture and engineering; agricultural; installation, maintenance, and repair; building and grounds cleaning and maintenance; and construction and extraction. Only a few green new and emerging occupations were identified in the survey. These green new and emerging occupations include positions such as energy auditor, LEED accredited professional, water treatment operator, and renewable energy consultant.

Figure 14: Current Occupational Profile of Respondent Green Businesses
(Number of Respondents = 65)



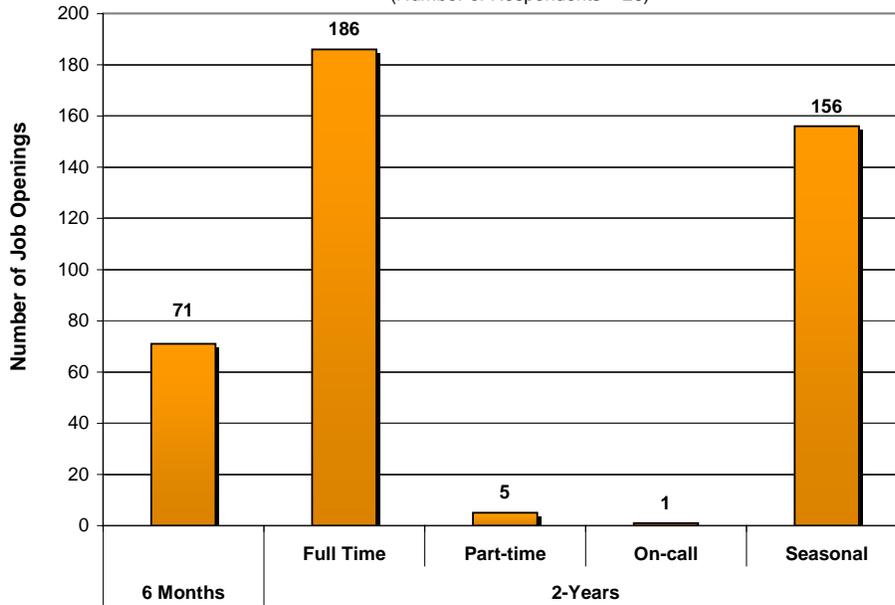
Source: Survey of Napa County Green Businesses

Projected Job Growth

Many employers seem confident that they will continue to add jobs over the next six months to two years. Although the survey was conducted during tough economic times, the majority of green business employers expected the number of jobs in their company to remain the same, with 18% of the employers expecting to add new workers over the next six months. The number of new full-time job openings is expected to grow by 9.4% over the next two years as the economy continues to recover. Seasonal/temporary jobs are expected to increase by nearly 8% during the same time period. Projected job growth by market segment is shown on Table 6 with green building jobs expected to see the largest gain.

Figure 15: Projected Hiring Demand By Green Businesses

(Number of Respondents = 26)



Source: Survey of Napa County Green Businesses

Table 5: Projected Number of New Job Openings by Occupation

(Number of Responses = 22)

Occupations	New Job Openings
Air Traffic Controller	1
Engineering Technician	1
Engineer and R&D	2
Architects, Draftsmen	2
Engineers	11
Project Geologist and/or Geotechnical Engineer	1
Construction Workers & General labor	103
Project managers and Assistants	10
Construction and energy rater	2
Management, drivers, assembly/sorting line workers, maintenance, and construction for bio gas plant	185
Production	6
Guest Representatives/Tour Host	1
CPA	1
Sales	2
Event Specialist	1
Press operator	1

Source: Napa County Green Business Survey

**Table 6: Projected Job Growth by Market Segment
Over Next Two Years**
(Number Responses = 23)

Market Segment	New Full-Time Job Openings
Cleantech	35
Environmental Services	13
Engineering	11
Green Building	116
Certified Green Businesses	11

Source: Napa County Green Business Survey

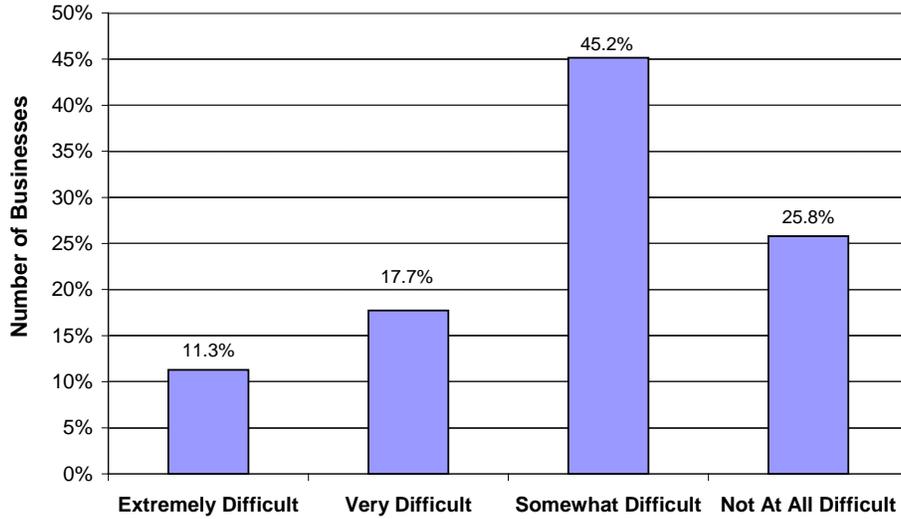
Level of Difficulty in Finding Qualified Workers

Sixty-two green businesses (83.8%) responded to the question about the level of difficulty in finding qualified workers with green job knowledge and skills. Of those, 74.2% answered that it was somewhat to extremely difficult finding qualified workers with green job knowledge and skills.

The biggest problem for employers is finding workers with strong work ethics and problem solving skills. Qualified workers with strong communication, math, and writing skills are also difficult to find.

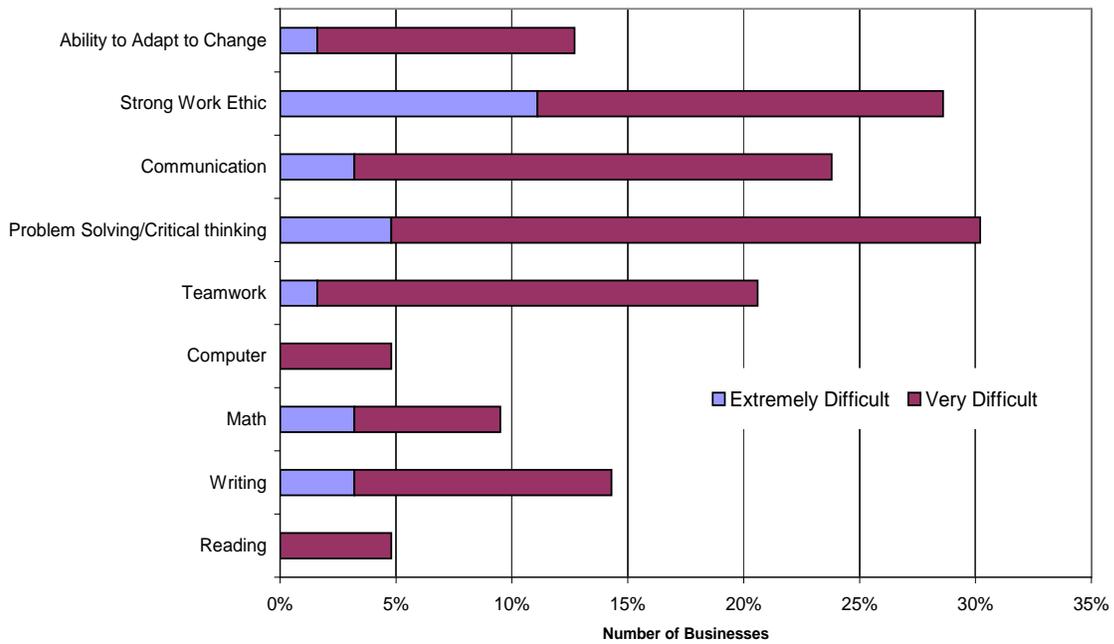
The survey of Napa County Green Businesses conducted for this report found 31% of the firms had difficulty in finding workers with green skills and 45% found it somewhat difficult. Many of these same firms also had difficulty in finding workers with basic skills. Forty-five (45%) percent of the green businesses were somewhat or very interested in a local community-based skills certification program that objectively evaluates the competencies of job applicants in basic skills, workplace skills, and job specific skills (e.g. Work Keys).

Figure 16: Difficulty in Finding Workers With Green Knowledge/Skills
(Number of Respondents = 62)



Source: Survey of Napa County Green Businesses

Figure 17: Percentage of Employers Who Have Difficulty Finding Workers With Basic Skills
(Number of Respondents = 63)



Source: Survey of Napa County Green Businesses

Green Workforce Training

■ Educational and Training Requirements for Green Occupations

The education and experience requirements for green jobs vary considerably depending on the type of job and work performed. As shown in *Table 11* in the Appendix, the levels of education and length of training required is highest for professional and technical occupations. Management, architectural, engineering, and other professional occupations generally require a four-year college degree or higher. Green jobs requiring mid-level preparation include a range of skilled occupations, many of which entail considerable preparation through a combination of classes and on-the-job training (OJT) or apprenticeships that can take up to four years to complete. Extensive OJT with supplemental coursework is a requirement of registered apprenticeship programs.

Of the 215 green occupations identified by O*NET (see Appendix), over 19% require mid-level preparation for an Associate Degree or Post-Secondary Vocational Training Certificate. Long-term on-the-job-training requiring more than 12 months of training or combined work experience and formal classroom instruction for workers to develop the skills needed is required for 10% of the green occupations. Short- to moderate-term OJT of up to 12 months with limited coursework represents 14.9% of the green occupations. Agriculture-related laborer occupations comprise less than 4% of the green occupations.

Many of the green related occupations differ little from their non-green counterparts within the same occupation. However, there are a few cases where new occupation titles would help to clarify the differences between popularly recognized green jobs and other non-green jobs performing similar activities. Certain occupational groups and individual occupations are more likely to require special requirements from job candidates.

Special Licenses and Certifications for Green Jobs

Few green jobs require occupation-specific certification or registration, such as enrollment in an apprenticeship program. Some green jobs require special licenses such as environmental cleanup or abatement certification, hazardous materials certificate, or a chemical pesticide applicator's license for hazardous waste abatement and handling. LEED (Leadership in Energy and Environmental Design) accreditation may be required for certain jobs in the green building sector. General knowledge about sustainability and green will be important for anyone seeking a green job. Some of the more common green certifications include:

1. Green Building Certifications

As green building and renovating becomes more popular, homeowners, commercial building owners, hospitals, and government buildings are looking for contractors, architects, engineers, specialty contractors, building managers, and real estate professionals who are qualified to provide green building services. The California Building Standards Commission

has adopted the first-in-the-nation green-building code known as CALGreen which requires residential and commercial developers to implement a wide range of sustainability measures in planning and design, energy efficiency, water efficiency and conservation, materials conservation, resource efficiency, and environmental air quality. Certain mandatory provisions are set to become effective January 1, 2011. Many of the inspections contemplated by CALGreen do not exist currently and will require education and training of the inspection professionals. Training and certification programs to support CALGreen, including courses for inspectors, plan reviewers, and other building professionals are available, although not generally within Napa County. There are also a growing number of municipal green building ordinances based on established third-party green building rating and verification systems, such as the U.S. Green Building Council's LEED certification program and Build It Green's GreenPoint Rated program.

LEED-AP (Leadership in Energy and Environmental Design - Accredited Professional):

This certification focuses on green building techniques and energy efficiency. Government buildings and privately owned properties will be built or retrofitted to be more energy efficient and environmentally friendly. The U.S. Green Building Council's Green Building Certification Institute's professional credentialing program provides third party administration and verification of the LEED Accredited Professional (AP) credentials, as well as credentials for LEED Green Associate, and LEED Fellow. Over 300 training providers nationwide are currently offering test preparation services for individuals in a wide variety of professions who want to become LEED APs.

Certified Green Building Professional training is available throughout California to assist building professionals involved in the design and construction of green buildings in the residential construction sector, as well as to professionals that support and develop the market for green building. Build It Green is the certification body for the Certified Green Building Professional training program.

CALGreenTraining.com program provides training and information about the application and use of the California Green Building Standards Code.

Associations & Licensing for Green Building Contractors in Napa County

USGBC - U.S. Green Building Council - <http://www.usgbc.org/>

Build It Green - www.builditgreen.org/

NCBE - North Coast Builders Exchange - <http://www.ncbeonline.com/>

ASE - Alliance to Save Energy - <http://www.ase.org/>

AWEA - American Wind Energy Association - <http://www.awea.org/>

2. Certified Environmental Auditor

Certified Environmental Auditor is a specialty certification program to credential professionals conducting environmental compliance and risk audits of operating facilities, related equipment and on-going procedures. As the green economy moves forward there is going to be an increased need for Environmental Auditors who understand climate change issues and make sure that businesses are in compliance with environmental regulations and protocols. The

National Registry of Environmental Professionals (<http://www.nrep.org/>) offers certification exams for those interested in becoming a Certified Environmental Auditor.

3. Carbon Accounting

The number of companies monitoring and disclosing greenhouse gas (GHG) emissions will increase as the California Air Resources Board adopts a cap and trade program. The Greenhouse Gas Management Institute (<http://www.ghginstitute.com/>) is committed to professionalizing the field of GHG Accounting and Management. It currently offers certificates of training in greenhouse gas accounting, verification, and offset projects. Everblue Training Institute in Berkeley (<http://www.everblueenergy.com/>) also offers training and certification in sustainability management and carbon accounting.

4. Certified Water Treatment Plant Operator

Water and wastewater treatment facilities will require new and more highly skilled plant operators as the baby boom generation retires. There are record numbers of these workers headed to retirement and few people in line to replace them. The U.S. Bureau of Labor Statistics expects big demand for this occupation due to an expected wave of baby-boomer retirements by longtime operators in coming years. Traditionally, this occupation only required a high school diploma, but increasingly, plant operators need to complete associate degree programs in water-quality and wastewater-treatment technology. Certification for this occupation is provided by the individual states.

5. Solar Installers and Service Technicians

Solar installers and service technicians install or service solar-thermal water heating systems, photovoltaic (PV) energy systems, or building integrated photovoltaic roofing and building materials. Training programs are offered by a variety of community colleges, private training providers, and nonprofit training providers such as the Solar Living Institute in Hopland, California (<http://www.solarliving.org/>). Union apprenticeship programs for electricians also include solar energy related training. Most training programs for PV installation are aligned with standards set by NABCEP, the North American Board of Certified Energy Practitioners (<http://www.nabcep.org/>).

6. Energy Auditors

An energy auditor can go into any business, large or small, and help them save on energy costs. The typical background for this field is construction related experience, although some engineers may have a good background for this work as well. But energy auditors need to be equally able and willing to work with hardware and software as well as work in attics, basements and crawl spaces. There are many certifications for energy auditors. Perhaps the two most important are BPI Building Analyst training and certification provided by the Building Performance Institute (BPI), and HERS (Home Energy Raters) training and certification provided by the Residential Energy Services Network (RESNET).

7. Wind Energy Installer/Technicians

As small wind turbines become more economical and practical for residential, industrial, and farm locations there will be a demand for workers that are knowledgeable about installation,

maintenance, and refurbishing. Very few training programs are currently available for this occupation, but some community colleges are beginning to offer courses in wind energy, or courses in renewable energy which generally include wind energy and solar energy modules.

8. Sustainability Coordinators, Officers and Managers

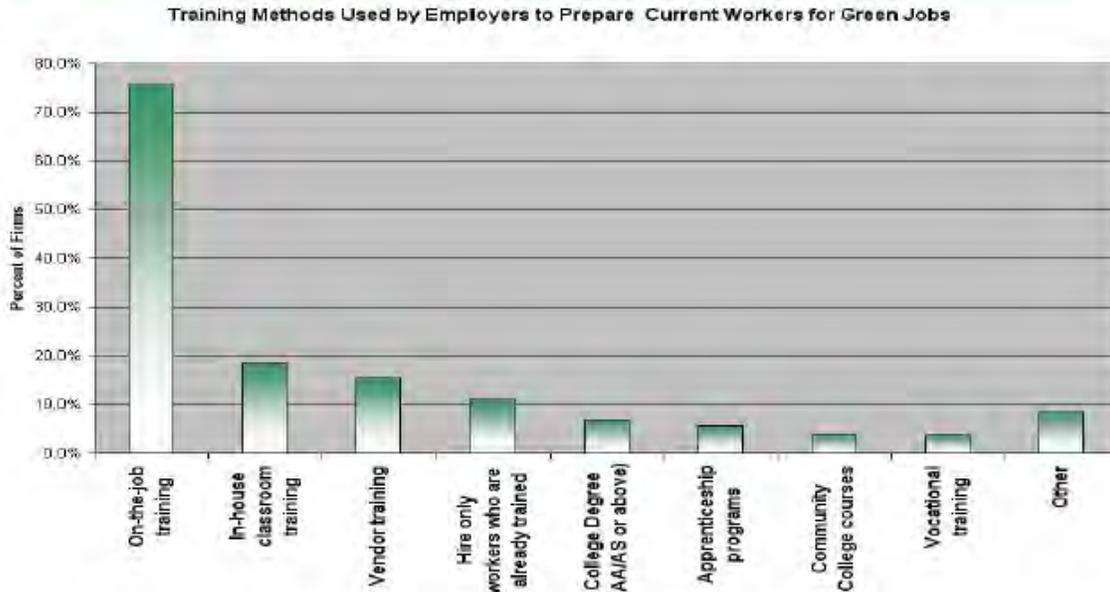
Businesses, organizations and government agencies around the world are realizing that harmonizing organizational practices with environmental stewardship is not only the right thing it to do, it is also just good business. Organizations that have a large number of people and a physical infrastructure that includes buildings, grounds, food service, a vehicle fleet, water/wastewater facilities, intensive use of energy, lots of equipment and appliances that use electricity, a transportation network, and the large-scale procurement of goods and services will eventually require a sustainability professional. Sustainability professionals play a strategically important role which may include education, advising, assessing return-on-investment options, managing carbon footprints or carbon emissions, managing waste streams, and determining how to save energy (and money). Sustainability professionals have a wide range of educational and professional backgrounds. Some have graduate degrees and some have little or no college education. Some have science backgrounds, some have business backgrounds, and some have facilities management backgrounds.

9. Environmental Engineering

The major areas include air pollution control, industrial hygiene, radiation protection, hazardous waste management, toxic materials control, water supply, wastewater management, storm water management, solid waste disposal, public health, and land management. Within each of these major categories are many sub-specialties. Environmental engineering jobs generally require a Bachelor's degree in environmental engineering.

Training Methods

On-the-Job training is the overwhelming training method used by employers to prepare workers for green jobs. A survey of California's Green Economy conducted by the California Employment Development Department from May 2009 to April 2010 found that more than 75% of the businesses surveyed used in-house training while training programs offered at community colleges or by vendors were used by less than 10% of the firms.¹³ On-the-job training is the method most often used with in-house classroom training coming in a distant second.



While in-house training remains the overwhelming preference of businesses in general, a survey by UC Berkeley found that “green companies rely slightly more on external programs and organizations for their training needs.”¹⁴ Solar installation firms tend to rely on their own in-house solar installation workshops/programs. However, many solar firms thought that “it would be great to have a statewide solar training program that focuses on the solar specific skill set.” Many green building companies mentioned their reliance on external organizations such as the *U.S. Green Building Council* or *Build It Green*, and educational institutions in the area.

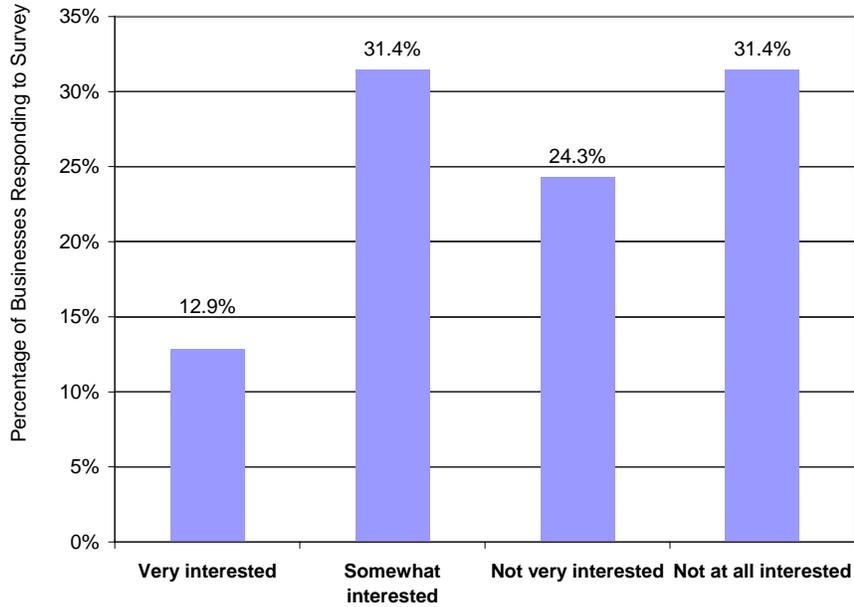
A survey of Napa County Green Businesses conducted for this report found 31% of the firms had difficulty in finding workers with green skills and 45% found it somewhat difficult. Many of these same firms also had difficulty in finding workers with basic skills. When asked “*how interested would you be in a local community-based skills certification program that objectively evaluates the competencies of job applicants in basic skills, workplace skills, and job specific skills,*” forty-four (44%) percent of the green businesses were somewhat or very interested in skills certification training programs. Local green businesses have a stronger interest in skills training than that

¹³ California Green Jobs Council, “California’s Green Economy”, April 21, 2010

¹⁴ Karen Chapple, et al, UC Berkeley Center for Community Innovation, “Innovating the Green Economy in California Regions”, February 2010

indicated by the statewide survey conducted by the Employment Development Department. Although green employers may train workers in-house, they still need workers with basic green knowledge and skill sets. Specialized training needs most likely to be required by green companies are technical/scientific degrees, specific environmental training or environmental certificates, and green building skills. An Associate's Degree in Applied Science can help lay the groundwork for many green careers.

Figure 19: Green Businesses Interested in Skills Certification Training Programs
(Number of Respondents = 70)



Source: Survey of Napa County Green Businesses

Green Training Programs

The responsibility to provide workforce training for the green economy largely falls on the community colleges, one-stop career centers, and other public and private training providers, including union apprenticeships, colleges and universities. Four-year colleges and universities play an important role with their certificate and degree programs that are typically required for most professional occupations, including scientists and engineers.

Our research identified the following six training programs offering green job related training in Napa County. All but one is offered by Napa Valley College.

- Computer Training Services (Certificate) - Alkar Computer Training (Napa)
- Viticulture and Winery Technology (Certificate) - Napa Valley College (Napa)
- Viticulture and Winery Technology-Viticulture (Degree) - Napa Valley College (Napa)
- Viticulture and Winery Technology-Wine Making (Degree) - Napa Valley College (Napa)
- Viticulture and Winery Technology-Wine Marketing and Sales (Degree) - Napa Valley College (Napa)
- Wine Marketing and Sales (Certificate) - Napa Valley College (Napa)

Note that Napa County's Career & Training Network includes an online postsecondary education/training directory which includes training programs available regionally. The directory can be found online at: www.napaworkforce.org.

Other Green Business Classes offered by Napa Valley College

Napa Valley College has recently offered contract-based courses in solar installation and energy auditing. Short-term courses like these may be offered in the future.

The Small Business Development Center (<http://napasbdc.org>) at Napa Valley College (www.napavalley.edu), through the Community Education program, offers several classes and workshops focused on the issue of sustainability and green business. Recent course offerings have included:

- Bottom Line Benefits of Greening Your Business (in partnership with the Napa Chamber of Commerce Business Builders Committee through the Wake Up Your Business Wednesday program)
- Intro to Solar Technology
- Greening Your Business 101: The Importance of Sustainability
- Greening Your Business: Achieving ABAG Green Business Certification
- Greening Your Business: Energy, Water & Resources Efficiency for Small Business Owners
- Greening Your Business: The Building Blocks for Using Today's Green Momentum to Secure a More Sustainable Future for Your Business

U.S. Green Building Council

The Redwood Empire chapter of the U.S. Green Building Council is considering whether to create a Napa Valley branch. If a Napa branch is established, various training programs would be available for individuals seeking green professional certification.

Gap Analysis and Recommendations

Basic introductory courses on green business practices are offered on a limited basis through the Small Business Development Center at Napa Valley College. There does not appear to be a clear and consistent demand for green business skills training, although 44% of the green businesses responding to the survey expressed interest in a skills certification program.

While Napa Valley College offers several courses in viticulture and wine technology, there is no distinct program offering for sustainable and organic agriculture and winemaking. There are no clearly identified local green building training and certification programs. The hospitality program at Napa Valley College does not offer a green hotel course or certification program.

In order to prepare a qualified workforce with green knowledge and skills to meet the industry's demand, there needs to be a consistent and clear demand by the business community for new and emerging green occupations and green enhanced skill occupations before education and training providers will commit to developing the necessary training programs. We recommend that the Napa County WIB and Napa Valley College should work with the Napa Chamber of Commerce and Napa County Certified Green Business and Winery Program to clearly identify the demand by the local business community for green business knowledge and skills. Additional programs and courses in sustainability, facility management, environmental management, green building, and sustainable agriculture would go far in addressing the demand identified by businesses responding to the survey.

APPENDIX

Figure 20: Napa County Green Economy Survey

<p>About this confidential survey: The confidential nature of this survey means that survey results will be aggregated and survey respondents will not be identified in any way.</p> <p>Please return the completed survey to: Jim Cassio, Principal Researcher By Fax: 916-405-3625 (please retain original) By e-mail: jim7@cassio.com By mail: c/o Napa Workforce Investment Board 650 Imperial Way, Suite 100, Napa, CA 94559 Or call Jim Cassio at 916-320-4944</p> <p>Complete survey online? To complete this survey online, please contact us and we will send you a link to our secure online survey.</p>	<p>Your contact information In case we need to clarify any information provided, to help us avoid duplication, and to notify you of the survey results:</p> <p>Your Name: _____</p> <p>Title: _____</p> <p>Company: _____</p> <p>Address: _____</p> <p>Phone: _____</p> <p>e-mail: _____</p> <p>Please complete & return this survey by:</p>
--	---

For the purposes of this survey, we are talking about the *green economy* as economic activity that reduces energy consumption, utilizes resources more efficiently, uses fewer toxic chemicals, generates less waste, and improves environmental quality. We are also interested in companies that produce new technologies or products that cut waste, improve the utilization of resources, and reduce pollution. Unless otherwise specified, please note that the questions in this survey are about your workers and jobs in Napa County.

General questions about your company and workforce

1. How many workers are employed by your company at all its locations – inside and outside of Napa County? _____

2. How many are working at your Napa County locations? _____ How many Napa County locations do you have? _____

3. Of your current workers at Napa locations, how many are:
 Full time: _____ Part time: _____ On call: _____ Temp or Seasonal: _____

4. About what percent of your workers live outside Napa County? _____ %

5. Over the past 12 months, has your number of workers in Napa: Increased Decreased Remained about the same

6. If your number of workers changed over the past 12 months, by about how many jobs did it increase or decrease?

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7. Please indicate your business activities at your Napa County locations (check all that apply):

- Corporate HQ R&D Manufacturing Sales & Marketing Distribution Other (please specify below)

8. Please indicate the industry that best describes your company in Napa County: NAICS industry code, if known: _____

- Construction Agriculture Wine production Cleantech Environmental services Hospitality
 Restaurant Architecture Engineering Banking Healthcare Other (please specify below)

Does your company produce a green or clean tech product? Yes No

9. If YES, please describe the product(s):

10. Does your company employ green business practices? Yes No

11. If so, please indicate which green business practices you use (check all that apply):

- Green construction Energy conservation Alternative energy Recycling Energy auditing Carbon footprint calculation Pollution prevention Environmentally-friendly purchasing Use low toxic cleaning supplies Water conservation Alternative fuel/hybrid electric vehicles Other (please specify below)

12. What is the occupational profile of your Napa County workers?

<i>Type of position</i>	<i>Approximate number of workers</i>	<i>Type of position</i>	<i>Approximate number of workers</i>
Management		Food Preparation and Serving Related	
Business and Financial Operations		Building and Grounds Cleaning and Maintenance	
Computer and Mathematical		Personal Care and Service	
Architecture and Engineering		Sales and Related	
Life, Physical, and Social Science		Office and Administrative Support	
Community and Social Service		Farming, Fishing, and Forestry	
Legal		Construction and Extraction	
Community and Social Service		Installation, Maintenance, and Repair	
Arts, Design, Entertainment, Sports, and Media		Production	
Healthcare Practitioners and Technical		Transportation and Material Moving	
Healthcare Support		Other (please specify below)	
Protective Service			

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13. What are the critical site location requirements for your company to expand in Napa County?

	Extremely Important	Very Important	Somewhat Important	Not Important
Availability of a skilled workforce	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relatively low labor costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of education and workforce training programs . . .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to suppliers and vendors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost of space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to end-user market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity of other companies in the same industry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions about the past 2 years

14. For what jobs did you hire the most replacement workers over the past 2 years?

- a) _____
 - b) _____
 - c) _____
-

15. For what jobs have you had significant difficulty finding qualified applicants who meet your hiring standards?

- a) _____
 - b) _____
 - c) _____
-

16. When you consider the new employees you have hired over the past 2 years, are there any specific knowledge, skills or abilities that you feel are in short supply? (please indicate the type of position and what is in short supply)

- a) _____
 - b) _____
 - c) _____
-

Questions about the next 2 years

17. About how many **new** jobs do you expect to add during the next 2 years?

Full time: _____ Part time: _____ On call: _____ Temp or Seasonal: _____

18. What types of jobs will make up the most new positions?

- a) _____
 - b) _____
 - c) _____
-

Questions about skills

19. In general, how difficult is it for you to find new workers who possess these skills prior to employment:

<i>Basic skills (check one box for each of the following):</i>	Extremely Difficult	Very Difficult	Somewhat Difficult	Not Difficult
Reading.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Writing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Math.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<i>Workplace skills (check one box for each of the following):</i>	Extremely Difficult	Very Difficult	Somewhat Difficult	Not Difficult
Teamwork.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem solving/critical thinking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communication.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strong work ethic.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to adapt to change.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green knowledge/skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Job specific skills</i> - e.g. keyboarding, ability to lift 50 lbs, product knowledge, supervisory skills, etc. (please specify skills below):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. How interested would you be in a local community-based skills certification program that objectively evaluates the competencies of job applicants in basic skills, workplace skills, and job specific skills? (Check one)

- Very interested Somewhat interested Not very interested Not at all interested
-

Methodology

For this study, we defined green industry sectors and market segments based on common definitions described by the Cleantech Group, New Energy Finance, Environmental Business International, US Green Building Council, Next 10, and others. Based on these industry segments we used various data sources to identify businesses involved in developing green products and providing green services. To identify companies employing green business practices we used the Napa County Certified Green Business Directory. Using these two definitions (mentioned previously in this report), a database was developed of Napa County Green Businesses and information about the size, location, and type of businesses was developed from company websites, Dun & Bradstreet, Manta, InfoUSA, and other sources.

How we identified firms

Several sources were used to identify green businesses including cleantech, green building, and solution providers such as traditional environmental technologies and services involved in air pollution control, remediation, and hazardous waste management. We searched online databases including industry association websites and conducted primary and secondary research. The key sources we used include:

Cleantech

Clean Edge defines cleantech as “a diverse range of products, services, and processes that harness renewable materials and energy sources and substantially reduce the use of all resources and dramatically cut or eliminate emissions and waste.”¹⁵ Data sources used to identify cleantech companies include:

California Green Maps – an online database of green businesses developed by the Environmental Defense Fund.

<http://www.edf.org/page.cfm?tagID=40388>

Cleantech Group

<http://cleantech.com/>

NorCal Solar Energy Association – membership directory for a non-profit educational organization whose mission is to foster the development and application of solar energy.

<http://www.noricalsolar.org/>

AZo Cleantech Directory – an online database of cleantech companies.

<http://www.azocleantech.com/cleantech-directory.asp>

Source Guides – an online database of green companies (retailers, manufacturers, installers etc.) throughout the U.S.

<http://energy.sourceguides.com/businesses/byGeo/US/byS/CA/CA.shtml>

My Primary Buyers Guide

<http://www.myprimebuyersguide.com/ca/napa-valley-solar-contractors.html>

¹⁵ Clean Edge

Green Building

Prime Buyers Report - Top 10 Green Builders in Napa County

<http://www.myprimebuyersguide.com/ca/napa-valley-green-building-contractors.html>

U.S. Green Building Council

<http://www.usgbc.org/>

Build It Green

<http://www.builditgreen.org/>

Green Wineries & Organic Grapes

<http://cawinemall.com/organic.htm>

http://www.napavintners.com/wineries/napa_green_wineries.asp

<http://www.villagegreenenergy.com/facebook-wineries/>

Environmental Services

InfoUSA database for Napa County

Labor Market & Occupational Analysis

The primary data sources used for the occupational analysis are O*NET and the California Employment Development Department.

O*NET Resource Center Online

The O*NET program is the nation's primary source of occupational information. The National Center for O*NET Development, as part of its efforts to keep up with the changing world of work, investigated the impact of green economy activities and technologies on occupational requirements and the development of new and emerging (N&E) occupations. Results of the research led to the identification of green economic sectors, green increased demand occupations, green enhanced skills occupations, and green new and emerging (N&E) occupations. <http://online.onetcenter.org/find/green?n=0&g=Go>

California Employment Development Department

<http://www.labormarketinfo.edd.ca.gov/OccGuides/SOCJOBFamily.aspx?Geography=0604000099>

Table 7: Green Market Segments for Clean Energy, Environmental Services & Green Building

Clean Energy

Market Segment	Description
1. Clean Energy & Bioenergy * Biofuels * Biomass, Solid Waste & Biogas * Geothermal * Small Hydro (<50MW) * Marine * Solar * Wind	biodiesel and bioethanol, excludes producers of base biomass, includes suppliers of processing technologies and equipment, through biofuel manufacturers, logistics and distribution Production of solid and gaseous fuels derived from biomass Geothermal & hydro technologies, developers, generators wave and tide energy technologies, components and subassemblies for wind turbines as well as manufacturers of turbines, developers, generators, utilities and engineering firms
2. Other Sectors * Services & Support	information and research providers, specialized clean energy financial services companies, consultants
3. Energy Smart Technologies * Energy Efficiency * Digital Energy * Power Storage * Hydrogen and fuel cells * Advanced Transportation	Technologies and practices aimed at improving efficiency on both the supply side - in generation, transmission and distribution - and on the demand side, including the built environment and industry. From CHP and superconducting transmission to efficient lighting, building materials, industrial processes and HVAC
4. Carbon Markets * Carbon Capture & Sequestration	Carbon Capture and Storage technologies
5. Nuclear * Nuclear	Developers, generators, disposal of spent fuel; security

Source: New Energy Finance
<http://www.newenergyfinance.com/markets/clean-energy/>

Environmental Sector

Market Segment	Description
1. Environmental Services * Environmental Testing & Analysis * Wastewater Treatment Works * Solid Waste Management * Hazardous Waste Management * Remediation/Industrial Services * Environmental Consulting & Engineering	
2. Environmental Equipment * Water Equipment & Chemicals * Instruments & Information System * Air Pollution Control Equipment * Waste Management Equipment * Process & Prevention Technology	
3. Environmental Resources * Water Utilities * Resource Recovery * Environmental Energy Sources	

Source: Environmental Business International Inc
<http://www.ebiusa.com/Segments.html>

Green Building

Market Segment	Description
<p>1. Contractors, Builders, Developers</p> <ul style="list-style-type: none"> * Land Subdivision and Development * Single Family Housing Construction * Multi-Family Housing Construction * Manufacturing & Industrial Bldg * Commercial & Institutional Bldg * Special Trade Contractors * Materials Recovery Facility * Alternative Energy Structure 	<p>Firms that have adopted green business practices, are members of green building organizations, have certified green professionals on staff, and are developing green building projects</p>
<p>2. Architects & Engineers</p> <ul style="list-style-type: none"> * Architectural Services * Landscape Architectural Services * Engineering Services 	<p>Certified Green Professionals</p>
<p>3. Green Building Product Mfg</p> <ul style="list-style-type: none"> * Energy Efficient Products * Insulation for Glass & Walls * Water Efficient Products & Systems * Recycled Products * Certified Wood Products * Waste Management Technologies * Low/Non VOC Sealants & Caulking * Low or Non VOC Paints * Flooring & Floor Covering * Fly ash construction brick 	<p>Building products that meet minimum standards for low toxicity, minimal chemical emissions, recycled content, recyclability, durability, moisture resistance, energy and water efficiency, and environmental and ecological installation procedures</p> <p>Green building materials are composed of recycled content or renewable, rather than nonrenewable resources. Products are manufactured using resource-efficient processes including reducing energy and water consumption, minimizing waste, and reducing greenhouse gases. Green building products use low or non-toxic materials and have minimal chemical emissions and are environmentally responsible because impacts are considered over the life of the product</p>
<p>4. Green Real Estate & Management</p> <ul style="list-style-type: none"> ▪ Green Real Estate Brokers ▪ Property Management 	

Source: U.S. Green Building Council

http://www.pa-greenbuildingproducts.org/market_opportunity_for_green.aspx

<http://www.buildinggreen.com/auth/article.cfm/2000/1/1/Building-Materials-What-Makes-a-Product-Green/>

Table 8: Distribution of establishments producing green goods and/or providing green services by industry sector, 2009

Industry Sector	Number of Establishments	Percent Distribution
Construction	820,700	38.1
Professional and business services	779,100	36.2
Other services (repair and maintenance)	183,300	8.5
Natural resources and mining	88,700	4.1
Information	77,000	3.6
Manufacturing	77,700	3.6
Trade, transportation, and utilities	49,300	2.3
Public administration	42,100	2.0
Education and health services	26,400	1.2
All other sectors	10,400	0.5
Total	2,154,700	100.0

Table 9: Napa County Green Occupations, Training Programs, & Training Providers

O*NET Occupation Title	Training Program	Training Provider
Construction Managers	Certified GreenPoint Rated: New Home Advisor/Rater	Build It Green (Oakland, CA)
Construction Managers	Certified GreenPoint Rated: Existing Home Advisor/Rater	Build It Green (Oakland, CA)
Construction Managers	Home Performance with ENERGY STAR	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Construction Managers	HERS Basic	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Construction Managers	HERS II	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Construction Managers	Green Building	Sonoma State University - School of Extended Education (Rohnert Park , CA)
Energy Auditors	BPI: Building Analyst Training & Exam	Build It Green (Oakland, CA)
Executive Secretaries and Administrative Assistants	Computer Training Services	Alkar Computer Training (Napa, CA)
Executive Secretaries and Administrative Assistants	Computer Network Technology	Napa Valley College (Napa, CA)
Farmers and Ranchers	Viticulture and Winery Technology	Napa Valley College (Napa, CA)
Farmers and Ranchers	Viticulture and Winery Technology-Viticulture	Napa Valley College (Napa, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Certified Green Building Professional (CGBP)	Build It Green (Oakland, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Advanced Certified Green Building Professional (CGBP) - Green Retrofitting & Remodeling	Build It Green (Oakland, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Certified GreenPoint Rated: New Home Advisor/Rater	Build It Green (Oakland, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Certified GreenPoint Rated: Existing Home Advisor/Rater	Build It Green (Oakland, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Home Performance with ENERGY STAR	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	HERS Basic	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	HERS II	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	Green Building	Sonoma State University - School of Extended Education (Rohnert Park , CA)
First-Line Supervisors/Managers of Food Preparation and Serving Workers	Hospitality and Tourism Management	Napa Valley College (Napa, CA)
First-Line Supervisors/Managers of Retail Sales Workers	Viticulture and Winery Technology-Wine Marketing and Sale	Napa Valley College (Napa, CA)
Green Marketers	Wine Marketing and Sales	Napa Valley College (Napa, CA)
Green Marketers	Viticulture and Winery Technology-Wine Marketing and Sales	Napa Valley College (Napa, CA)
Heating and Air Conditioning Mechanics and Installers	Home Performance with ENERGY STAR	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
<u>Heating and Air Conditioning Mechanics and Installers</u>	HERS Basic	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Heating and Air Conditioning Mechanics and Installers	HERS II	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)

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Urban and Regional Planners	Green Building	Sonoma State University - School of Extended Education (Rohnert Park , CA)
Civil Engineers	Certified Green Building Professional (CGBP)	Build It Green (Oakland, CA)
Civil Engineers	Advanced Certified Green Building Professional (CGBP) - Green Retrofitting & Remodeling	Build It Green (Oakland, CA)
Civil Engineers	Certified GreenPoint Rated: New Home Advisor/Rater	Build It Green (Oakland, CA)
Civil Engineers	Certified GreenPoint Rated: Existing Home Advisor/Rater	Build It Green (Oakland, CA)
Civil Engineers	Home Performance with ENERGY STAR	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Civil Engineers	HERS Basic	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Civil Engineers	HERS II	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Civil Engineers	Green Building	Sonoma State University - School of Extended Education (Rohnert Park , CA)
Construction and Building Inspectors	Certified Green Building Professional (CGBP)	Build It Green (Oakland, CA)
Construction and Building Inspectors	Advanced Certified Green Building Professional (CGBP) - Green Retrofitting & Remodeling	Build It Green (Oakland, CA)
Construction and Building Inspectors	Certified GreenPoint Rated: New Home Advisor/Rater	Build It Green (Oakland, CA)
Construction and Building Inspectors	Certified GreenPoint Rated: Existing Home Advisor/Rater	Build It Green (Oakland, CA)
Construction and Building Inspectors	Home Performance with ENERGY STAR	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Construction and Building Inspectors	HERS Basic	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Construction and Building Inspectors	HERS II	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Construction and Building Inspectors	Green Building	Sonoma State University - School of Extended Education (Rohnert Park , CA)
Construction Managers	Certified Green Building Professional (CGBP)	Build It Green (Oakland, CA)
Construction Managers	Advanced Certified Green Building Professional (CGBP) - Green Retrofitting & Remodeling	Build It Green (Oakland, CA)
Architects, Except Landscape and Naval	Certified Green Building Professional (CGBP)	Build It Green (Oakland, CA)
Architects, Except Landscape and Naval	Advanced Certified Green Building Professional (CGBP) - Green Retrofitting & Remodeling	Build It Green (Oakland, CA)
Architects, Except Landscape and Naval	Certified GreenPoint Rated: New Home Advisor/Rater	Build It Green (Oakland, CA)
Architects, Except Landscape and Naval	Certified GreenPoint Rated: Existing Home Advisor/Rater	Build It Green (Oakland, CA)
Architects, Except Landscape and Naval	Home Performance with ENERGY STAR	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Architects, Except Landscape and Naval	HERS Basic	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Architects, Except Landscape and Naval	HERS II	CBPCA (Cal Building Performance Contractors Assn) (Oakland, CA)
Architects, Except Landscape and Naval	Green Building	Sonoma State University - School of Extended Education (Rohnert Park , CA)

Source: Napa County WIB

Table 10: BUREAU OF LABOR STATISTICS GREEN INDUSTRIES by NAICS Code
Industries where green goods and services are classified

24-Aug-10

NAICS 2007	Title	BLS GGS in scope	Green goods and services category					Examples
			1. Energy from renewable sources	2. Energy Efficiency	3. Pollution reduction and removal, greenhouse gas reduction, and recycling and reuse	4. Natural resource conservation	5. Environmental compliance, education and training, and public awareness	
	Total included in final definition	333	58	140	122	74	45	
111110	Soybean farming	Y	x			x		USDA certified organic produce, soybeans for biodiesel
111120	Oilseed, except soybean, farming	Y	x			x		USDA certified organic produce
111130	Dry pea and bean farming	Y	x			x		USDA certified organic produce
111140	Wheat farming	Y	x			x		USDA certified organic produce
111150	Corn farming	Y	x			x		USDA certified organic produce, corn for ethanol
111160	Rice farming	Y	x			x		USDA certified organic produce
111191	Oilseed and grain combination farming	Y	x			x		USDA certified organic produce
111199	All other grain farming	Y	x			x		USDA certified organic produce, sorghum for ethanol
111211	Potato farming	Y	x			x		USDA certified organic produce
111219	Other vegetable and melon farming	Y	x			x		USDA certified organic produce
111310	Orange groves	Y	x			x		USDA certified organic produce
111320	Citrus, except orange, groves	Y	x			x		USDA certified organic produce
111331	Apple orchards	Y	x			x		USDA certified organic produce
111332	Grape vineyards	Y	x			x		USDA certified organic produce
111333	Strawberry farming	Y	x			x		USDA certified organic produce
111334	Berry, except strawberry, farming	Y	x			x		USDA certified organic produce
111335	Tree nut farming	Y	x			x		USDA certified organic produce
111336	Fruit and tree nut combination farming	Y	x			x		USDA certified organic produce
111339	Other non-citrus fruit farming	Y	x			x		USDA certified organic produce
111411	Mushroom production	Y	x			x		USDA certified organic produce
111419	Other food crops grown under cover	Y	x			x		USDA certified organic produce
111421	Nursery and tree production	Y				x		USDA certified organic produce

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111422	Floriculture production	Y				x	USDA certified organic produce
111910	Tobacco farming	Y				x	USDA certified organic produce
111920	Cotton farming	Y				x	USDA certified organic produce
111930	Sugarcane farming	Y	x			x	USDA certified organic produce, sugarcane for ethanol
111940	Hay farming	Y				x	USDA certified organic produce
111991	Sugar beet farming	Y	x			x	USDA certified organic produce, sugar beets for ethanol
111992	Peanut farming	Y				x	USDA certified organic produce
111998	All other miscellaneous crop farming	Y				x	USDA certified organic produce
112111	Beef cattle ranching and farming	Y				x	USDA certified organic beef
112112	Cattle feedlots	Y				x	USDA certified organic meat
112120	Dairy cattle and milk production	Y				x	USDA certified organic dairy
112210	Hog and pig farming	Y				x	USDA certified organic meat
112310	Chicken egg production	Y				x	USDA certified organic meat
112320	Broilers and meat type chicken production	Y				x	USDA certified organic meat
112330	Turkey production	Y				x	USDA certified organic meat
112340	Poultry hatcheries	Y				x	USDA certified organic meat
112390	Other poultry production	Y				x	USDA certified organic meat
112410	Sheep farming	Y				x	USDA certified organic meat
112420	Goat farming	Y				x	USDA certified organic meat
112511	Finfish farming and fish hatcheries	Y				x	USDA certified organic meat
112512	Shellfish farming	Y				x	USDA certified organic meat
112519	Other aquaculture	Y				x	USDA certified organic meat
112910	Apiculture	Y				x	Organic honey
112930	Fur-bearing animal and rabbit production	Y				x	USDA certified organic meat
112990	All other animal production	Y				x	USDA certified organic meat
113110	Timber tract operations	Y					Sustainable certified timber
113210	Forest nursery and gathering forest products	Y				x	Growing trees for reforestation
113310	Logging	Y	x				Wood chips for biomass
115112	Soil preparation, planting, and cultivating	Y				x	Specialized services for USDA certified organic production
115113	Crop harvesting, primarily by machine	Y				x	Specialized services for USDA certified organic production
115114	Other postharvest crop activities	Y				x	Specialized services for USDA certified organic production
115116	Farm management services	Y				x	Specialized services for USDA certified organic production
115210	Support activities for animal production	Y				x	Specialized services for USDA certified organic production

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115310	Support activities for forestry	Y				x	Reforestation consulting, specialized services to sustainable certified forest production
221111	Hydroelectric power generation	Y	x				Electricity from hydroelectric power
221113	Nuclear electric power generation	Y			x		Electricity from nuclear power
221119	Other electric power generation	Y	x				Electricity generated from biomass, solar, wind, geothermal, or other renewable sources except hydroelectric
221310	Water supply and irrigation systems	Y			x		Water treatment services
221320	Sewage treatment facilities	Y			x		Sewage treatment services
221330	Steam and air-conditioning supply	Y	x	x	x		Geothermal steam
236115	New single-family general contractors	Y		x	x		LEED single family residences
236116	New multifamily general contractors	Y		x	x		LEED apartment buildings
236117	New housing operative builders	Y		x	x		LEED buildings sold to clients
236118	Residential remodelers	Y		x	x		Weatherization
236210	Industrial building construction	Y		x	x		LEED-certified buildings
236220	Commercial building construction	Y		x	x		LEED-certified buildings
237110	Water and sewer system construction	Y			x		Construction of water treatment plants, geothermal plants
237130	Power and communication system construction	Y	x	x	x		Construction of renewable energy plants, powerline construction to new renewable energy production sites.
237210	Land subdivision	Y	x	x		x	Smart growth developments, power site development
237990	Other heavy construction	Y	x	x	x		Nuclear waste disposal site construction, dams, parks, subways
238111	Residential poured foundation contractors	Y		x	x		Pouring LEED eligible foundations, pouring foundations for LEED construction projects
238112	Nonresidential poured foundation contractors	Y		x	x		Pouring LEED eligible foundations, pouring foundations for LEED construction projects
238121	Residential structural steel contractors	Y			x		Construction of LEED-eligible buildings
238122	Nonresidential structural steel contractors	Y			x		Construction of LEED-eligible buildings
238131	Residential framing contractors	Y		x			Construction of LEED- and Energy Star certified buildings

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238132	Nonresidential framing contractors	Y		x			Construction of LEED- and Energy Star certified buildings
238141	Residential masonry contractors	Y		x			Construction of LEED-eligible buildings
238142	Nonresidential masonry contractors	Y		x			Construction of LEED-eligible buildings
238151	Residential glass and glazing contractors	Y		x			Installation of Energy Star certified windows, LEED-eligible windows; installing windows on LEED construction project
238152	Nonresidential glass and glazing contractors	Y		x			Installation of Energy Star certified windows, LEED-eligible windows; installing windows on LEED construction project
238161	Residential roofing contractors	Y		x			Installation of Energy Star certified roofs, LEED eligible roof, roof work on LEED project
238162	Nonresidential roofing contractors	Y		x			Installation of Energy Star certified roofs, LEED eligible roof, roof work on LEED project
238171	Residential siding contractors	Y		x			Installation of energy-efficient or LEED-eligible siding; installing siding on LEED project
238172	Nonresidential siding contractors	Y		x			Installation of energy-efficient or LEED-eligible siding; installing siding on LEED project
238191	Other residential exterior contractors	Y		x			Building of curtain walls to LEED standards
238192	Other nonresidential exterior contractors	Y		x			Building of curtain walls to LEED standards
238211	Residential electrical contractors	Y		x			Installation of efficient environmental control systems
238212	Nonresidential electrical contractors	Y		x			Installation of efficient environmental control systems
238221	Residential plumbing and HVAC contractors	Y		x			Installation of Energy Star HVAC systems
238222	Nonresidential plumbing and HVAC contractors	Y		x			Installation of Energy Star HVAC systems
238291	Other residential building equipment contractors	Y		x			Installation of revolving doors for LEED standards
238292	Other nonresidential bldg equipment contractors	Y		x			Installation of revolving doors for LEED standards
238311	Residential drywall contractors	Y		x	x		Installation of LEED-eligible drywall
238312	Nonresidential drywall contractors	Y		x	x		Installation of LEED-eligible drywall

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238321	Residential painting contractors	Y			x			Use of LEED-eligible paints meeting VOC limits
238322	Nonresidential painting contractors	Y			x			Use of LEED-eligible paints meeting VOC limits
238331	Residential flooring contractors	Y			x			Use of LEED-eligible, low-emitting material-based floorings
238332	Nonresidential flooring contractors	Y			x			Use of LEED-eligible, low-emitting material-based floorings
238341	Residential tile and terrazzo contractors	Y			x			Use of LEED-eligible, low-emitting material-based tiles
238342	Nonresidential tile and terrazzo contractors	Y			x			Use of LEED-eligible, low-emitting material-based tiles
238351	Residential finish carpentry contractors	Y		x				Installation of LEED-eligible windows
238352	Nonresidential finish carpentry contractors	Y		x				Installation of LEED-eligible windows
238391	Other residential finishing contractors	Y		x				Installation of LEED-eligible weather stripping
238392	Other nonresidential finishing contractors	Y		x				Installation of LEED-eligible weather stripping
238911	Residential site preparation contractors	Y			x		x	LEED-eligible demolition contractors
238912	Nonresidential site preparation contractors	Y			x		x	LEED-eligible demolition contractors
238991	All other residential trade contractors	Y			x		x	LEED-eligible concrete paving
238992	All other nonresidential trade contractors	Y			x		x	LEED-eligible concrete paving
314110	Carpet and rug mills	Y		x				LEED-eligible carpeting
314121	Curtain and drapery mills	Y		x				LEED-eligible curtains
314999	All other miscellaneous textile product mills	Y			x			Reclaimed wool, recovered fibers, weatherstripping
321114	Wood preservation	Y		x	x			LEED-eligible construction materials
321211	Hardwood veneer and plywood manufacturing	Y			x			LEED-eligible construction materials
321212	Softwood veneer and plywood manufacturing	Y			x			LEED-eligible construction materials
321213	Engineered wood member manufacturing	Y			x			LEED-eligible construction materials
321214	Truss manufacturing	Y			x			LEED-eligible construction materials
321219	Reconstituted wood product manufacturing	Y		x	x			LEED-eligible construction materials
321911	Wood window and door manufacturing	Y			x			LEED-eligible construction materials

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321918	Other millwork, including flooring	Y			x			LEED-eligible construction materials
321991	Manufactured home, mobile home mfg	Y		x	x			LEED-eligible, Energy Star prefabricated homes
321992	Prefabricated wood building mfg	Y		x	x			LEED-eligible, Energy Star prefabricated homes
322110	Pulp mills	Y			x		x	Pulp made with recycled inputs
322121	Paper, except newsprint, mills	Y			x		x	Paper made with recycled inputs
322122	Newsprint mills	Y			x		x	Newsprint made with recycled inputs
322130	Paperboard mills	Y			x		x	Paperboard made with recycled inputs
324121	Asphalt paving mixture and block mfg.	Y			x			Rubberized asphalt
324122	Asphalt shingle and coating materials mfg.	Y		x				LEED-eligible roofing asphalt
325193	Ethyl alcohol manufacturing	Y	x					Ethanol production
325199	All other basic organic chemical mfg.	Y	x					Transesterification of vegetable oils to produce fuels or fuel additives
325311	Nitrogenous fertilizer manufacturing	Y			x			Fertilizer manufactured from sewage or animal waste
325510	Paint and coating manufacturing	Y			x			LEED-eligible low VOC paints
325520	Adhesive manufacturing	Y			x			LEED-eligible low VOC adhesives
325611	Soap and other detergent manufacturing	Y			x			Biodegradable soap
325612	Polish and other sanitation good mfg.	Y			x			LEED-eligible low VOC polishes
325910	Printing ink manufacturing	Y			x			Soy-based printing inks
325991	Custom compounding of purchased resins	Y			x			Reformulated plastics resins from recycled plastics products
325998	Other miscellaneous chemical product mfg.	Y			x			Soy-based writing inks
326191	Plastics plumbing fixture mfg	Y					x	EPA WaterSense certified plumbing fixtures
326192	Resilient floor covering manufacturing	Y		x	x			LEED-eligible floor coverings
326212	Tire retreading	Y			x			Retreaded tires
326299	All other rubber product manufacturing	Y			x			Reclaimed rubber from waste or scrap
327111	Vitreous china plumbing fixture mfg	Y					x	EPA WaterSense certified plumbing fixtures
327112	Vitreous china and earthenware articles mfg.	Y					x	EPA WaterSense certified plumbing fixtures
327121	Brick and structural clay tile mfg	Y		x				LEED-eligible construction materials
327122	Ceramic wall and floor tile manufacturing	Y		x				LEED-eligible construction materials

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327123	Other structural clay product manufacturing	Y		x			LEED-eligible construction materials
327124	Clay refractory manufacturing	Y		x			LEED-eligible construction materials
327125	Non-clay refractory manufacturing	Y		x			LEED-eligible construction materials
327211	Flat glass manufacturing	Y			x		Flat glass from recycled inputs (cullet)
327212	Other pressed and blown glass and glassware	Y			x		Glassware from recycled inputs (cullet)
327213	Glass container manufacturing	Y			x		Glass containers from recycled inputs (cullet)
327310	Cement manufacturing	Y		x			LEED-eligible cement
327320	Ready-mix concrete manufacturing	Y		x			LEED-eligible concrete
327331	Concrete block and brick manufacturing	Y		x			LEED-eligible concrete blocks
327332	Concrete pipe manufacturing	Y		x			LEED-eligible concrete pipes
327390	Other concrete product manufacturing	Y		x			LEED-eligible concrete roofing tile
327410	Lime manufacturing	Y		x			LEED-eligible limestone
327420	Gypsum product manufacturing	Y		x			LEED-eligible gypsum board
327993	Mineral wool manufacturing	Y		x			Insulation materials
327999	Miscellaneous nonmetallic mineral products	Y		x			LEED-eligible dry mix concrete
331111	Iron and steel mills	Y			x		Steel containing scrap inputs
331314	Secondary smelting and alloying of aluminum	Y			x		Aluminum containing scrap inputs
331315	Aluminum sheet, plate, and foil mfg	Y			x		Aluminum containing scrap inputs
331316	Aluminum extruded product mfg	Y			x		Aluminum containing scrap inputs
331423	Secondary processing of copper	Y			x		Copper containing scrap inputs
331492	Secondary processing of other nonferrous	Y			x		Other nonferrous metals containing scrap inputs
331512	Steel investment foundries	Y	x				Identifiable, specialized inputs for renewable energy
331513	Steel foundries, except investment	Y	x				Identifiable, specialized inputs for renewable energy
331521	Aluminum die-casting foundries	Y	x				Identifiable, specialized inputs for renewable energy
331522	Nonferrous, except Al, die-casting foundries	Y	x				Identifiable, specialized inputs for renewable energy
331524	Aluminum foundries, except die-casting	Y	x				Identifiable, specialized inputs for renewable energy
331525	Copper foundries, except die-casting	Y	x				Identifiable, specialized inputs for renewable energy

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331528	Other nonferrous foundries, exc. Die-casting	Y	x				Identifiable, specialized inputs for renewable energy
332111	Iron and steel forging	Y	x	x	x		Identifiable, specialized inputs for renewable energy
332112	Nonferrous forging	Y	x	x	x		Identifiable, specialized inputs for renewable energy
332312	Fabricated structural metal mfg	Y		x			LEED-eligible concrete reinforcing bars
332321	Metal window and door manufacturing	Y		x			LEED-eligible, Energy Star certified metal windows
332911	Industrial valve manufacturing	Y			x		Valves for nuclear reactors
332913	Plumbing fixture fitting and trim mfg.	Y		x			EPA WaterSense certified faucets
332919	Other metal valve and pipe fitting mfg.	Y		x			EPA WaterSense certified plumbing devices
332996	Fabricated pipe and pipe fitting mfg.	Y		x			LEED-eligible pipes or pipe fittings
333112	Lawn and garden equipment manufacturing	Y			x		Electric lawnmowers
333311	Automatic vending machine mfg	Y		x			Energy Star certified vending machines
333312	Commercial laundry and dry-cleaning machinery	Y		x			Energy Star certified laundry machines
333315	Photographic and photocopying equipment mfg.	Y		x			Energy Star certified copying equipment
333319	Other commercial & service machinery mfg	Y			x		Water treatment equipment
333411	Air purification equipment mfg	Y			x		Air purification equipment
333412	Industrial and commercial fan and blower mfg.	Y		x			LEED-eligible fans, Energy Star certified fans
333414	Heating equipment, except warm air furnaces	Y	x	x			Solar heating systems manufacturing
333415	AC, refrigeration, and forced air heating	Y	x	x			Energy Star certified AC units; heat pumps
333511	Industrial mold manufacturing	Y	x				Molds for wind turbines
333611	Turbine and turbine generator set units mfg.	Y	x		x		Wind turbines; hydroelectric turbines; nuclear power turbines
333612	Speed changer, drive, and gear manufacturing	Y	x				Wind turbines; hydroelectric turbines
333613	Mechanical power transmission equipment mfg.	Y	x				Wind turbines; hydroelectric turbines
334111	Electronic computer manufacturing	Y		x			Energy Star certified computers
334113	Computer terminal manufacturing	Y		x			Energy Star certified computers
334119	Other computer peripheral equipment mfg.	Y		x			Energy Star certified printers
334210	Telephone apparatus manufacturing	Y		x			Energy Star certified telephones

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334220	Broadcast and wireless communications equip.	Y		x			Energy Star certified cable boxes
334290	Other communications equipment mfg	Y		x			Energy Star certified products
334310	Audio and video equipment mfg	Y		x			Energy Star certified products
334413	Semiconductors and related device mfg.	Y		x	x		Solar cells
334512	Automatic environmental control mfg	Y			x		Energy cutoff controls, residential and commercial types
334513	Industrial process variable instruments	Y		x	x		Water quality monitoring and control systems
334514	Totalizing fluid meters and counting devices	Y		x	x		Water meters, consumption registering
334515	Electricity and signal testing instruments	Y		x			Energy measuring equipment, electrical
334516	Analytical laboratory instrument mfg.	Y			x		Thermal conductivity instruments and sensors
334519	Other measuring and controlling device mfg.	Y	x		x		Wind direction indicators; physical properties testing equipment; automotive emissions testing equipment
335110	Electric lamp bulb and part mfg	Y		x			Energy Star certified light bulbs
335121	Residential electric lighting fixture mfg.	Y		x			Energy Star certified light fixtures
335122	Nonresidential electric lighting fixture mfg.	Y		x			Energy Star certified light fixtures
335129	Other lighting equipment mfg	Y		x			Energy Star certified light fixtures
335211	Electric housewares & household fan mfg	Y		x			Energy Star certified fans
335221	Household cooking appliance manufacturing	Y		x			Energy Star certified stoves
335222	Household refrigerator and home freezer mfg.	Y		x			Energy Star certified refrigerators
335224	Household laundry equipment mfg.	Y		x			Energy Star certified laundry machines
335228	Other major household appliance mfg.	Y		x			Energy Star certified hot water heaters
335311	Electric power and specialty transformer mfg.	Y		x			Voltage regulating transformers, electric power
335312	Motor and generator manufacturing	Y		x			Energy Star certified battery chargers
335911	Storage battery manufacturing	Y		x			Rechargeable batteries
335912	Primary battery manufacturing	Y		x			Mercury free batteries
335999	Miscellaneous electrical equipment mfg.	Y		x			Energy Star certified battery chargers
336111	Automobile manufacturing	Y		x	x		EPA Smart Way certified vehicles

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336112	Light truck and utility vehicle manufacturing	Y		x	x		EPA Smart Way certified vehicles
336311	Carburetor, piston, ring, and valve mfg.	Y		x	x		Specialized parts for EPA Smart Way certified vehicles
336312	Gasoline engine and engine parts mfg.	Y		x	x		Specialized parts for EPA Smart Way certified vehicles
336322	Other motor vehicle electric equipment mfg.	Y		x	x		Specialized parts for EPA Smart Way certified vehicles
336340	Motor vehicle brake system manufacturing	Y		x	x		Specialized parts for EPA Smart Way certified vehicles
336350	Motor vehicle power train components mfg.	Y		x	x		Specialized parts for EPA Smart Way certified vehicles
336399	All other motor vehicle parts manufacturing	Y		x	x		Specialized parts for EPA Smart Way certified vehicles; catalytic converters
336510	Railroad rolling stock manufacturing	Y		x	x		Railroad cars for mass transit
336611	Ship building and repairing	Y		x	x		Ferries for mass transit
337211	Wood office furniture manufacturing	Y			x		Low-emitting office furniture
337214	Office furniture, except wood, mfg	Y			x		Low-emitting office furniture
337920	Blind and shade manufacturing	Y		x			LEED-eligible window coverings
423930	Recyclable material merchant wholesalers	Y			x		Dismantling of motor vehicles for purpose of wholesaling scrap
453310	Used merchandise stores	Y					
483114	Coastal and Great Lakes passenger transport.	Y		x			Ferry commuter services
483212	Inland water passenger transportation	Y		x			Inland ferry commuter services
485111	Mixed mode transit systems	Y		x			Mass transit systems
485112	Commuter rail systems	Y		x			Mass transit systems
485113	Bus and other motor vehicle transit systems	Y		x			Mass transit systems
485119	Other urban transit systems	Y		x			Mass transit systems
485210	Interurban and rural bus transportation	Y		x			Commuter-based bus services
485410	School and employee bus transportation	Y		x			School bus transportation
485510	Charter bus industry	Y	x		x		Multi-passenger commuter services
485999	All other ground passenger transportation	Y		x			Vanpools
511110	Newspaper publishers	Y				x	Environmental or trade/association newspapers
511120	Periodical publishers	Y				x	Environmental, training or association periodicals
511130	Book publishers	Y				x	Environmental or training books/manuals
511140	Directory and mailing list publishers	Y				x	Industry association directories or mailing lists

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511199	All other publishers	Y					x	Environmental or association calendars, etc.
511210	Software publishers	Y		x	x		x	Training software, software used to reduce or monitor energy usage, pollution
512110	Motion picture and video production	Y					x	Environmental content, training movies or videos
512120	Motion picture and video distribution	Y					x	Distribution of environmental, training content
515111	Radio networks	Y					x	Environmental content for radio broadcasting
515112	Radio stations	Y					x	Environmental content for radio broadcasting
515120	Television broadcasting	Y					x	Environmental content for TV broadcasting
515210	Cable and other subscription programming	Y					x	Environmental content for cable distribution
519110	News syndicates	Y					x	Environmental news media
519120	Libraries and archives	Y					x	Libraries specializing in environment materials
519130	Internet publishing and web search portals	Y					x	Environmental, training, compliance websites
523130	Commodity contracts dealing	Y			x			Emissions allowance trading
523140	Commodity contracts brokerage	Y			x			Emissions allowance trading
523210	Securities and commodity exchanges	Y			x			Emissions allowance trading
541110	Offices of lawyers	Y					x	Environmental legal services
541310	Architectural services	Y		x	x			LEED-specific architecture service, energy efficient architecture services
541320	Landscape architectural services	Y		x	x	x		Energy efficient landscaping services, LEED acceptable landscaping services
541330	Engineering services	Y	x	x	x	x		Engineering services for renewable energy projects, LEED projects, energy efficient projects
541350	Building inspection services	Y					x	Services related to compliance with regulations, to meet environmental standards (LEED)
541360	Geophysical surveying and mapping services	Y	x					Geophysical surveying for geothermal resources
541370	Other surveying and mapping services	Y	x					Land surveying for LEED projects
541380	Testing laboratories	Y					x	Environmental testing services
541410	Interior design services	Y		x				Interior energy efficient,

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								resource efficient design services
541420	Industrial design services	Y		x				Industrial energy efficient, resource efficient design services
541430	Graphic design services	Y					x	Graphic design services for environmental awareness products
541511	Custom computer programming services	Y		x		x		Programming services for computer systems to monitor or regulate emissions or energy usage
541512	Computer systems design services	Y		x		x		Design services for computer systems to monitor or regulate emissions or energy usage
541614	Process and logistics consulting services	Y		x				Freight consulting, logistics consulting, efficiency consulting services
541620	Environmental consulting services	Y	x	x		x	x	Environmental consulting services
541690	Other technical consulting services	Y	x	x		x	x	Agriculture, energy consulting services
541711	Research and development in biotechnology	Y	x			x		Research on biofuels, organisms used to reduce pollution
541712	Other physical and biological research	Y	x			x		Environmental research and development laboratories or services
541810	Advertising agencies	Y					x	Environmental advertising for public awareness
541820	Public relations agencies	Y					x	Environmental public relations for awareness
541922	Commercial photography	Y					x	Environmental photography
551114	Managing offices	Y					x	Headquarters for environment-related companies
561520	Tour operators	Y					x	Environmental/eco-tourism
561730	Landscaping services	Y	x	x		x		Energy efficient landscaping services
562111	Solid waste collection	Y				x		Collection and hauling of mixed recyclable materials
562112	Hazardous waste collection	Y				x		Collection of hazardous waste
562119	Other waste collection	Y				x		Waste management
562211	Hazardous waste treatment and disposal	Y				x		Treatment and disposal of hazardous waste
562212	Solid waste landfill	Y						Sorting of recycled materials
562213	Solid waste combustors and incinerators	Y	x					Generation of energy from

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								landfill gas
562219	Other nonhazardous waste disposal	Y			x			Waste management
562910	Remediation services	Y			x			Waste management
562920	Materials recovery facilities	Y			x			Waste management
562991	Septic tank and related services	Y			x			Waste management
562998	Miscellaneous waste management services	Y			x			Waste management
611210	Junior colleges	Y					x	Training/curriculum for green jobs
611310	Colleges and universities	Y					x	Training/curriculum for green jobs
611430	Management training	Y					x	Training/curriculum for green jobs
611513	Apprenticeship training	Y					x	Training/curriculum for green jobs
611519	Other technical and trade schools	Y					x	Training/curriculum for green jobs
712110	Museums	Y					x	Environment and science museums
712130	Zoos and botanical gardens	Y				x	x	Botanical gardens, zoos
712190	Nature parks and other similar institutions	Y				x	x	Nature preserves
811111	General automotive repair	Y		x	x			Repair of parts for hybrid cars
811112	Automotive exhaust system repair	Y		x	x			Repair of emissions control systems
811113	Automotive transmission repair	Y		x	x			Repair of parts for hybrid cars
811118	Other automotive mechanical and elec. repair	Y		x	x			Repair of parts for hybrid cars
811211	Consumer electronics repair and maintenance	Y		x				Repair of Energy Star certified electronics
811212	Computer and office machine repair	Y		x				Repair of Energy Star certified computers
811213	Communication equipment repair	Y		x				Repair of Energy Star certified telephones
811219	Other electronic equipment repair	Y		x				Repair of Energy Star certified electronics
811310	Commercial machinery repair and maintenance	Y		x				Repair of Energy Star certified commercial equipment
811412	Appliance repair and maintenance	Y		x				Repair of Energy Star certified appliances
813211	Grantmaking foundations	Y					x	Environmental research/education grants
813219	Other grantmaking and giving services	Y					x	Environmental research/education grants
813312	Environment and conservation orgs	Y					x	Environmental organizations
813910	Business associations	Y					x	Industry associations

NAPA COUNTY'S EMERGING GREEN ECONOMY

813920	Professional organizations	Y					x	Industry associations
813940	Political organizations	Y					x	Environmental political groups
924110	Air, water, and waste program administration	Y			x		x	Administer waste collection programs
924120	Administration of conservation programs	Y				x	x	Administer conservation programs
926110	Administration of general economic programs	Y					x	Green jobs training
926120	Transportation program administration	Y		x			x	Mass transit planning
926130	Utility regulation and administration	Y		x			x	Utility regulation
926140	Agricultural market and commodity regulation	Y			x	x	x	Certifies organic producers
926150	Licensing and regulating commercial sectors	Y			x		x	Regulate businesses for environmental compliance; building inspections

Table 11: O*NET Green Occupations by SOC Classification
 With EDD Occupational Employment Statistics 2010 Q1 Wage Data for **Napa County**
 Note: **California** wage data was used when no wage data was available for Napa County

Category	SOC Code	Occupation	Mean Annual Wage	Education & Training
Transportation: This sector covers activities related to increasing efficiency and/or reducing environmental impact of various modes of transportation including trucking, mass transit, and freight rail.				
Green Enhanced Skills	49-3023.02	Automotive Specialty Technicians	\$48,525	Post-Secondary Vocational Training
Green Enhanced Skills	17-2072.00	Electronics Engineers, Except Computer	\$80,399	Bachelor's Degree
Green Enhanced Skills	17-2141.00	Mechanical Engineers	\$99,832	Bachelor's Degree
Green Enhanced Skills	43-5071.00	Shipping, Receiving, and Traffic Clerks	\$33,761	Short Term OJT
Green Enhanced Skills	11-3071.01	Transportation Managers	\$86,450	Work Experience in a Related Occupation
Green Enhanced Skills	53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	\$62,260	Work Experience in a Related Occupation
Green Enhanced Skills	53-3032.00	Truck Drivers, Heavy and Tractor-Trailer	\$42,181	Short Term OJT
Green New & Emerging	17-3027.01	Automotive Engineering Technicians	\$53,302	Associate Degree
Green New & Emerging	17-2141.02	Automotive Engineers	\$99,832	Bachelor's Degree
Green New & Emerging	43-5011.01	Freight Forwarders	\$42,716	Moderate Term OJT
Green New & Emerging	17-2141.01	Fuel Cell Engineers	\$99,832	Bachelor's Degree
Green New & Emerging	17-3029.10	Fuel Cell Technicians	\$63,510	Associate Degree
Green New & Emerging	13-1081.02	Logistics Analysts	\$70,882	Bachelor's Degree

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green New & Emerging	13-1081.01	Logistics Engineers	\$70,882	Bachelor's Degree
Green New & Emerging	11-9199.06	Logistics Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	11-9199.04	Supply Chain Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	17-2051.01	Transportation Engineers	\$90,977	Bachelor's Degree
Green New & Emerging	19-3099.01	Transportation Planners	\$77,353	Master's Degree

Recycling and Waste Reduction: This sector covers activities related to solid waste and wastewater management, treatment, and reduction, as well as processing recyclable materials.

Green Enhanced Skills	47-4041.00	Hazardous Materials Removal Workers	\$42,085	Moderate Term OJT
Green Enhanced Skills	53-7081.00	Refuse and Recyclable Material Collectors	\$46,311	Short Term OJT
Green New & Emerging	51-9199.01	Recycling and Reclamation Workers	\$35,213	Moderate Term OJT
Green New & Emerging	53-1021.01	Recycling Coordinators	\$49,944	Work Experience in a Related Occupation

Manufacturing: This sector covers activities related to manufacturing of green technology as well as energy efficient manufacturing processes.

Green Enhanced Skills	17-3023.03	Electrical Engineering Technicians	\$65,725	Associate Degree
Green Enhanced Skills	17-3024.00	Electro-Mechanical Technicians	\$53,191	Associate Degree
Green Enhanced Skills	17-3026.00	Industrial Engineering Technicians	\$48,778	Associate Degree
Green Enhanced Skills	51-9061.00	Inspectors, Testers, Sorters, Samplers, and Weighers	\$38,324	Moderate Term OJT
Green Enhanced Skills	51-4041.00	Machinists	\$49,186	Long Term OJT
Green Enhanced Skills	49-9042.00	Maintenance and Repair Workers, General	\$44,944	Moderate Term OJT
Green Enhanced Skills	29-9012.00	Occupational Health and Safety Technicians	\$49,417	Associate Degree

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green Enhanced Skills	41-4011.00	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	\$84,478,	Moderate Term OJT
Green Enhanced Skills	51-9012.00	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	\$51,344	Moderate Term OJT
Green Enhanced Skills	47-2211.00	Sheet Metal Workers	\$63,539	Long Term OJT
Green Enhanced Skills	43-5071.00	Shipping, Receiving, and Traffic Clerks	\$33,761	Short Term OJT
Green New & Emerging	17-2199.01	Biochemical Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3029.02	Electrical Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-3029.03	Electromechanical Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-3029.04	Electronics Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-3029.05	Industrial Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	13-1081.02	Logistics Analysts	\$70,882	Bachelor's Degree
Green New & Emerging	13-1081.01	Logistics Engineers	\$70,882	Bachelor's Degree
Green New & Emerging	11-9199.06	Logistics Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	17-3029.06	Manufacturing Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-2199.04	Manufacturing Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3029.09	Manufacturing Production Technicians	\$63,510	Associate Degree
Green New & Emerging	17-3029.07	Mechanical Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-2199.05	Mechatronics Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-2199.06	Microsystems Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-2199.09	Nanosystems Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3029.12	Nanotechnology Engineering Technicians	\$63,510	Associate Degree

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green New & Emerging	17-3029.11	Nanotechnology Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-2199.07	Photonics Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3029.08	Photonics Technicians	\$63,510	Associate Degree
Green New & Emerging	17-2199.08	Robotics Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3024.01	Robotics Technicians	\$53,191	Associate Degree
Green New & Emerging	11-9199.04	Supply Chain Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	17-2199.02	Validation Engineers	\$77,731	Bachelor's Degree

Green Construction: This sector covers activities related to constructing new green buildings, retrofitting residential and commercial buildings, and installing other green construction technology.

Green Enhanced Skills	17-1011.00	Architects, Except Landscape and Naval	\$89,637	Bachelor's Degree
Green Enhanced Skills	17-2051.00	Civil Engineers	\$90,977	Bachelor's Degree
Green Enhanced Skills	47-4011.00	Construction and Building Inspectors	\$74,708	Work Experience in a Related Occupation
Green Enhanced Skills	47-2061.00	Construction Laborers	\$39,783	Moderate Term OJT
Green Enhanced Skills	11-9021.00	Construction Managers	\$126,634	Bachelor's Degree
Green Enhanced Skills	17-2071.00	Electrical Engineers	\$109,988	Bachelor's Degree
Green Enhanced Skills	13-2051.00	Financial Analysts	\$98,451	Bachelor's Degree
Green Enhanced Skills	47-4041.00	Hazardous Materials Removal Workers	\$42,085	Moderate Term OJT
Green Enhanced Skills	49-9021.01	Heating and Air Conditioning Mechanics and Installers	\$68,864	Postsecondary Vocational Award
Green Enhanced Skills	17-1012.00	Landscape Architects	\$75,390	Bachelor's Degree
Green Enhanced Skills	49-9042.00	Maintenance and Repair Workers, General	\$44,944	Moderate OJT

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green Enhanced Skills	17-2141.00	Mechanical Engineers	\$99,832	Bachelor's Degree
Green Enhanced Skills	47-2152.01	Pipe Fitters and Steamfitters	\$58,235	Long Term OJT
Green Enhanced Skills	47-2152.02	Plumbers	\$58,235	Long Term OJT
Green Enhanced Skills	51-8013.00	Power Plant Operators	\$72,781	Long Term OJT
Green Enhanced Skills	47-2181.00	Roofers	\$45,951	Moderate OJT
Green Enhanced Skills	47-2211.00	Sheet Metal Workers	\$63,539	Long Term OJT
Green Enhanced Skills	13-1073.00	Training and Development Specialists	\$67,905	Bachelor's Degree
Green Enhanced Skills	19-3051.00	Urban and Regional Planners	\$86,208	Master's Degree
Green New & Emerging	17-2199.03	Energy Engineers	\$77,731	Bachelor's Degree

Environment Protection: This sector covers activities related to environmental remediation, climate change adaptation, and ensuring or enhancing air quality.

Green Enhanced Skills	19-2021.00	Atmospheric and Space Scientists	\$61,569	Bachelor's Degree
Green Enhanced Skills	11-9021.00	Construction Managers	\$126,634	Bachelor's Degree
Green Enhanced Skills	11-9041.00	Engineering Managers	\$115,286	Bachelor's Degree, plus work experience
Green Enhanced Skills	17-3025.00	Environmental Engineering Technicians	\$55,788	Associate Degree
Green Enhanced Skills	17-2081.00	Environmental Engineers	\$86,138	Bachelor's Degree
Green Enhanced Skills	19-4091.00	Environmental Science and Protection Technicians, Including Health	\$58,298	Associate Degree
Green Enhanced Skills	19-2042.00	Geoscientists, Except Hydrologists and Geographers	\$85,213	Master's Degree
Green Enhanced Skills	47-4041.00	Hazardous Materials Removal Workers	\$42,085	Moderate Term OJT
Green Enhanced Skills	17-1012.00	Landscape Architects	\$75,390	Bachelor's Degree

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green Enhanced Skills	49-9042.00	Maintenance and Repair Workers, General	\$44,944	Moderate Term OJT
Green Enhanced Skills	27-3031.00	Public Relations Specialists	\$46,460	Bachelor's Degree
Green Enhanced Skills	27-3022.00	Reporters and Correspondents	\$43,633	Bachelor's Degree
Green Enhanced Skills	19-1031.01	Soil and Water Conservationists	\$69,758	Bachelor's Degree
Green New & Emerging	11-9199.11	Brownfield Redevelopment Specialists and Site Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	19-2041.01	Climate Change Analysts	\$65,625	Master's Degree
Green New & Emerging	19-3011.01	Environmental Economists	\$97,974	Master's Degree
Green New & Emerging	19-2041.02	Environmental Restoration Planners	\$65,625	Master's Degree
Green New & Emerging	19-2041.03	Industrial Ecologists	\$65,625	Master's Degree
Green New & Emerging	11-9121.02	Water Resource Specialists	\$144,267	Bachelor's Degree, plus work experience
Green New & Emerging	17-2051.02	Water/Wastewater Engineers	\$90,977	Bachelor's Degree

Research, Design, and Consulting Services: This sector encompasses "indirect jobs" to the green economy which includes activities such as energy consulting or research and other related business services.

Green Enhanced Skills	23-1022.00	Arbitrators, Mediators, and Conciliators	\$77,511	Bachelor's Degree, plus work experience
Green Enhanced Skills	17-1011.00	Architects, Except Landscape and Naval	\$91,497	Bachelor's Degree
Green Enhanced Skills	19-2021.00	Atmospheric and Space Scientists	\$86,203	Bachelor's Degree
Green Enhanced Skills	17-2051.00	Civil Engineers	\$90,977	Bachelor's Degree
Green Enhanced Skills	17-2071.00	Electrical Engineers	\$77,731	Bachelor's Degree
Green Enhanced Skills	17-2072.00	Electronics Engineers, Except Computer	\$80,399	Bachelor's Degree
Green Enhanced Skills	11-9041.00	Engineering Managers	\$115,286	Bachelor's Degree, plus work experience

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green Enhanced Skills	13-2051.00	Financial Analysts	\$98,451	Bachelor's Degree
Green Enhanced Skills	19-4041.02	Geological Sample Test Technicians	\$82,531	Associate Degree
Green Enhanced Skills	19-4041.01	Geophysical Data Technicians	\$82,531	Associate Degree
Green Enhanced Skills	19-2042.00	Geoscientists, Except Hydrologists and Geographers	\$85,213	Master's Degree
Green Enhanced Skills	11-2021.00	Marketing Managers	\$122,762	Bachelor's Degree, plus work experience
Green Enhanced Skills	17-2141.00	Mechanical Engineers	\$99,832	Bachelor's Degree
Green Enhanced Skills	17-2161.00	Nuclear Engineers	\$107,270	Bachelor's Degree
Green Enhanced Skills	13-2052.00	Personal Financial Advisors	\$68,555	Bachelor's Degree
Green Enhanced Skills	27-3031.00	Public Relations Specialists	\$46,460	Bachelor's Degree
Green Enhanced Skills	27-3022.00	Reporters and Correspondents	\$43,633	Long Term OJT
Green Enhanced Skills	41-4011.00	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	\$84,478	Work Experience in related occupation
Green Enhanced Skills	43-5071.00	Shipping, Receiving, and Traffic Clerks	\$33,761	Short Term OJT
Green Enhanced Skills	13-1073.00	Training and Development Specialists	\$67,905	Bachelor's Degree
Green Enhanced Skills	19-3051.00	Urban and Regional Planners	\$86,208	Master's Degree
Green Enhanced Skills	13-1022.00	Wholesale and Retail Buyers, Except Farm Products	\$50,818	Long Term OJT
Green New & Emerging	17-2141.02	Automotive Engineers	\$99,832	Bachelor's Degree
Green New & Emerging	17-2199.01	Biochemical Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3029.02	Electrical Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-3029.03	Electromechanical Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-3029.04	Electronics Engineering Technologists	\$63,510	Associate Degree

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green New & Emerging	17-2199.03	Energy Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	13-2099.01	Financial Quantitative Analysts	\$46,332	Bachelor's Degree
Green New & Emerging	17-2141.01	Fuel Cell Engineers	\$99,832	Bachelor's Degree
Green New & Emerging	15-1099.07	Geographic Information Systems Technicians	\$71,050	Associate Degree
Green New & Emerging	15-1099.06	Geospatial Information Scientists and Technologists	\$71,050	Associate Degree
Green New & Emerging	11-2011.01	Green Marketers	\$65,081	Bachelor's Degree, plus work experience
Green New & Emerging	17-3029.05	Industrial Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	13-2099.03	Investment Underwriters	\$46,332	Bachelor's Degree
Green New & Emerging	13-1081.02	Logistics Analysts	\$70,882	Bachelor's Degree
Green New & Emerging	13-1081.01	Logistics Engineers	\$70,882	Bachelor's Degree
Green New & Emerging	11-9199.06	Logistics Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	17-3029.06	Manufacturing Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-2199.04	Manufacturing Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3029.09	Manufacturing Production Technicians	\$63,510	Associate Degree
Green New & Emerging	17-3029.07	Mechanical Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-2199.05	Mechatronics Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-2199.06	Microsystems Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-2199.09	Nanosystems Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3029.11	Nanotechnology Engineering Technologists	\$63,510	Associate Degree
Green New & Emerging	17-2199.07	Photonics Engineers	\$77,731	Bachelor's Degree

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green New & Emerging	17-3029.08	Photonics Technicians	\$63,510	Associate Degree
Green New & Emerging	19-4099.02	Precision Agriculture Technicians	\$48,398	Associate Degree
Green New & Emerging	19-2099.01	Remote Sensing Scientists and Technologists	\$100,471	Bachelor's Degree
Green New & Emerging	19-4099.03	Remote Sensing Technicians	\$48,398	Associate Degree
Green New & Emerging	13-2099.02	Risk Management Specialists	\$46,332	Bachelor's Degree
Green New & Emerging	17-2199.08	Robotics Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	17-3024.01	Robotics Technicians	\$53,191	Associate Degree
Green New & Emerging	41-3031.03	Securities and Commodities Traders	\$103,758	Bachelor's Degree
Green New & Emerging	11-9199.04	Supply Chain Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	17-2051.01	Transportation Engineers	\$90,977	Bachelor's Degree
Green New & Emerging	19-3099.01	Transportation Planners	\$77,353	Master's Degree
Green New & Emerging	17-2199.02	Validation Engineers	\$77,731	Bachelor's Degree

Energy Efficiency: This sector covers activities related to increasing energy efficiency (broadly defined), making energy demand response more effective, constructing "smart grids," and other energy efficient activities.

Green Enhanced Skills	17-2071.00	Electrical Engineers	\$77,731	Bachelor's Degree
Green Enhanced Skills	13-2051.00	Financial Analysts	\$98,451	Bachelor's Degree
Green Enhanced Skills	11-1021.00	General and Operations Managers	\$132,993	Bachelor's Degree, plus work experience
Green Enhanced Skills	49-9021.01	Heating and Air Conditioning Mechanics and Installers	\$68,864	Postsecondary Vocational award
Green Enhanced Skills	49-9042.00	Maintenance and Repair Workers, General	\$44,944	Moderate Term OJT
Green Enhanced Skills	17-2141.00	Mechanical Engineers	\$99,832	Bachelor's Degree

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green Enhanced Skills	13-1073.00	Training and Development Specialists	\$67,905	Bachelor's Degree
Green Enhanced Skills	53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	\$62,260	Work experience in related occupation
Green New & Emerging	13-1199.01	Energy Auditors	\$57,986	Bachelor's Degree
Green New & Emerging	17-2199.03	Energy Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	47-4099.03	Weatherization Installers and Technicians	\$38,450	Moderate Term OJT

Renewable Energy Generation: This sector covers activities related to developing and using energy sources such as solar, wind, geothermal, and biomass. It also includes traditional, non-renewable sources of energy undergoing significant green technological changes (e.g., oil, coal, gas, and nuclear).

Green Enhanced Skills	17-2051.00	Civil Engineers	\$90,977	Bachelor's Degree
Green Enhanced Skills	47-5041.00	Continuous Mining Machine Operators	\$50,385	Moderate Term OJT
Green Enhanced Skills	17-2071.00	Electrical Engineers	\$77,731	Bachelor's Degree
Green Enhanced Skills	19-4041.02	Geological Sample Test Technicians	\$82,531	Moderate Term OJT
Green Enhanced Skills	51-4041.00	Machinists	\$49,186	Long Term OJT
Green Enhanced Skills	49-9042.00	Maintenance and Repair Workers, General	\$44,944	Moderate Term OJT
Green Enhanced Skills	17-2141.00	Mechanical Engineers	\$99,832	Bachelor's Degree
Green Enhanced Skills	51-8013.00	Power Plant Operators	\$72,781	Long Term OJT
Green Enhanced Skills	51-9012.00	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	\$51,344	Moderate Term OJT
Green Enhanced Skills	47-5013.00	Service Unit Operators, Oil, Gas, and Mining	\$56,630	Moderate Term OJT
Green Enhanced Skills	47-2211.00	Sheet Metal Workers	\$63,539	Long Term OJT
Green Enhanced Skills	11-3071.02	Storage and Distribution Managers	\$86,450	Work Experience in related occupation
Green New & Emerging	51-8099.01	Biofuels Processing Technicians	\$61,023	Long Term OJT

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green New & Emerging	11-3051.03	Biofuels Production Managers	\$110,152	Work Experience in related occupation
Green New & Emerging	11-9041.01	Biofuels/Biodiesel Technology and Product Development Managers	\$115,286	Bachelor's Degree, plus work experience
Green New & Emerging	51-8099.03	Biomass Plant Technicians	\$61,023	Long Term OJT
Green New & Emerging	11-3051.04	Biomass Production Managers	\$110,152	Work Experience in related occupation
Green New & Emerging	11-3051.02	Geothermal Production Managers	\$110,152	Work Experience in related occupation
Green New & Emerging	49-9099.01	Geothermal Technicians	\$37,749	Moderate Term OJT
Green New & Emerging	51-8099.04	Hydroelectric Plant Technicians	\$61,023	Long Term OJT
Green New & Emerging	11-3051.06	Hydroelectric Production Managers	\$110,152	Work Experience in related occupation
Green New & Emerging	11-3051.05	Methane/Landfill Gas Collection System Operators	\$110,152	Work Experience in related occupation
Green New & Emerging	51-8099.02	Methane/Landfill Gas Generation System Technicians	\$61,023	Long Term OJT
Green New & Emerging	47-1011.03	Solar Energy Installation Managers	\$68,983	Work experience in related occupation
Green New & Emerging	17-2199.11	Solar Energy Systems Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	47-4099.01	Solar Photovoltaic Installers	\$38,450	Moderate Term OJT
Green New & Emerging	41-4011.07	Solar Sales Representatives and Assessors	\$84,478	Work Experience in related occupation
Green New & Emerging	47-4099.02	Solar Thermal Installers and Technicians	\$38,450	Moderate Term OJT
Green New & Emerging	17-2199.10	Wind Energy Engineers	\$77,731	Bachelor's Degree
Green New & Emerging	11-9199.09	Wind Energy Operations Managers	\$107,019	Work Experience in a Related Occupation

NAPA COUNTY'S EMERGING GREEN ECONOMY

Green New & Emerging	11-9199.10	Wind Energy Project Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	49-9099.02	Wind Turbine Service Technicians	\$37,749	Moderate Term OJT

Agriculture and Forestry: This sector covers activities related to using natural pesticides, efficient land management or farming, and aquaculture.

Green Increased Demand	45-2011.00	Agricultural Inspectors	\$48,645	Work Experience in a Related Occupation
Green Enhanced Skills	19-4011.01	Agricultural Technicians	\$41,473	Associate Degree
Green Enhanced Skills	11-9012.00	Farmers and Ranchers	\$82,902	Long Term OJT
Green Increased Demand	45-1011.07	First-Line Supervisors/Managers of Agricultural Crop and Horticultural Workers	\$47,877	Work Experience in a Related Occupation
Green Enhanced Skills	11-1021.00	General and Operations Managers	\$132,993	Bachelor's Degree, plus work experience
Green Enhanced Skills	17-1012.00	Landscape Architects	\$75,390	Bachelor's Degree
Green New & Emerging	19-4099.02	Precision Agriculture Technicians	\$48,398	Associate Degree
Green Increased Demand	13-1021.00	Purchasing Agents and Buyers, Farm Products	\$73,470	Work Experience in a Related Occupation

Energy and Carbon Capture and Storage: This sector covers activities related to capturing and storing energy and/or carbon emissions, as well as technologies related to power plants using the integrated gasification combined cycle (IGCC) technique.

Green Enhanced Skills	51-8013.00	Power Plant Operators	\$72,781	Long Term OJT
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Energy Trading: This sector covers financial services related to buying and selling energy as an economic commodity, as well as carbon trading projects.

Green New & Emerging	41-3099.01	Energy Broker	\$58,486	Moderate Term OJT
Green New & Emerging	13-2099.03	Investment Underwriters	\$46,332	Bachelor's Degree
Green New & Emerging	41-3031.03	Securities and Commodities Traders	\$103,758	Bachelor's Degree

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Governmental and Regulatory Administration: This sector covers activities by public and private organizations associated with conservation and pollution prevention, regulation enforcement, and policy analysis and advocacy.

Green Enhanced Skills	23-1022.00	Arbitrators, Mediators, and Conciliators	\$77,511	Bachelor's Degree, plus work experience
Green Enhanced Skills	47-4011.00	Construction and Building Inspectors	\$74,708	Work Experience in a Related Occupation
Green Enhanced Skills	17-2081.00	Environmental Engineers	\$86,138	Bachelor's Degree
Green Enhanced Skills	13-2051.00	Financial Analysts	\$98,451	Bachelor's Degree
Green Enhanced Skills	51-9061.00	Inspectors, Testers, Sorters, Samplers, and Weighers	\$38,324	Moderate Term OJT
Green Enhanced Skills	17-2161.00	Nuclear Engineers	\$107,270	Bachelor's Degree
Green Enhanced Skills	19-1031.01	Soil and Water Conservationists	\$69,758	Bachelor's Degree
Green Enhanced Skills	53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	\$62,260	Work Experience in a Related Occupation
Green Enhanced Skills	19-3051.00	Urban and Regional Planners	\$86,208	Master's Degree
Green Increased Demand	45-2011.00	Agricultural Inspectors	\$48,645	Work Experience in a Related Occupation
Green New & Emerging	11-1011.03	Chief Sustainability Officers	\$199,730	Bachelor's Degree, plus work experience
Green New & Emerging	11-9199.02	Compliance Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	13-1199.01	Energy Auditors	\$57,986	Bachelor's Degree
Green New & Emerging	11-9199.01	Regulatory Affairs Managers	\$107,019	Work Experience in a Related Occupation
Green New & Emerging	13-1041.07	Regulatory Affairs Specialists	\$68,375	Long Term OJT
Green New & Emerging	13-1199.05	Sustainability Specialists	\$57,986	Bachelor's Degree
Green New & Emerging	19-3099.01	Transportation Planners	\$77,353	Long Term OJT

Research and analysis for this report were conducted by Jim Cassio & Associates in association with Craft Consulting Group.

Jim Cassio & Associates is a workforce development consulting firm which specializes in industry and occupational research and workforce information.

www.cassio.com

(916) 320-4944

198 Willow Creek Drive

Folsom, CA 95630

Jim Cassio, Principal Consultant

Daniela Sonnino, Research Assistant

Craft Consulting Group is an economic and business consultancy focused on assisting private and public sector clients understand and develop strategies to succeed in the increasingly complex economic environment in which they compete.

www.craftconsulting.net

(925) 283-4981

3527 Mt. Diablo Blvd., #320

Lafayette, CA 94549

Gary W. Craft, Principal

Kevin Strichter, Research Assistant

Acknowledgements

Bruce Wilson, Director

Napa County Workforce Investment Board

650 Imperial Way

Napa, California 94559

Phone: (707) 259-8679

www.napaworkforce.org