

Digest of Green Reports and Studies

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| Title | <i>Understanding the Green Economy in California: A Community College Perspective</i> |
| Author | None Given |
| Organization | Centers of Excellence, Economic and Workforce Development Program, California Community Colleges |
| Author Contact | None Given |
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| URL | http://www.coecc.net/Environmental_Scans/GreenEcon_Scan_SW_09.pdf |
| Summary | The report presents the findings of a Center of Excellence's case study, whose main purpose was to determine the "opportunities for training in green industries using existing industries and occupations as the base." The process to determine this involved gathering information on emerging green jobs and green industries (using NAICS and SOC codes), and then using these data to identify which areas need more training, and will need more training in the future. Community Colleges can then use this information to alter and improve their green training programs. |
| Key Findings | <ul style="list-style-type: none"> • The Framework of Green industries and jobs that are laid out in this report can be used by community colleges to "better understand the green economy" so that they can determine what programs to offer. • Identified the six major sectors/areas of the green economy: <ol style="list-style-type: none"> 1. Renewable Energy: Energy Generation, System Installation and Storage 2. Green Building and Energy Efficiency 3. Biofuels Production and Farming 4. Transportation and Alternative Fuels 5. Water, Wastewater, and Waste Management 6. Environmental Compliance and Sustainability Planning |
| Recommendations | <p>The information that is presented in the report can be used by community colleges to:</p> <ol style="list-style-type: none"> 1. "Identify Existing Occupational training programs related to traditional occupations with SOC codes" 2. "Relate those occupational programs to new and emerging occupational areas" 3. "Get a sense of how those occupational programs relate to emerging industry clusters and sectors " 4. "Understand how they relate to the six major green industry sectors identified in the crosswalk" 5. "Use this information to create regional partnership and responses to green industry needs" |
| Definition of "Green" | <p>"A Green Firm is an organization that provides products and/or services that are aimed at utilizing resources more efficiently, providing renewable sources of energy, lowering greenhouse gas emissions, or otherwise minimizing environmental impact."</p> <p>"A Green Job is an occupation that 1) directly works with policies, information, materials, and/or technologies that contribute to minimizing environmental impact, and 2) requires specialized knowledge, skills, training, or experience in these areas."</p> |
| Methodology | Literature Research |
| Data Sources Cited | Labor Market Information Division, California |
| Report Geography | California |
| Green Occupations Cited | <ul style="list-style-type: none"> • Accountants (SOC 13-2011.01) • Agricultural engineers (17-2021) • Agricultural inspectors (45-2011) • Agricultural technicians (SOC 19-4011.01) • Air emissions permitting engineer • Alternative fuel engine design and vehicle • Alternative fuel vehicle diagnosticians Natural gas vehicle technicians • Alternative fuels policy analysts |

9021)

- Alternative fuels policy analysts Sustainability planners
- Architects, except landscape and naval (SOC 17-1011)
- Architectural and civil drafters (SOC 17-3011)
- Auditors
- Automotive power electronics engineers Repair & maintenance of alternative
- Automotive technicians and repairers (SOC 49-3020)
- Biodiesel technicians
- Biodiesel/Biofuel technology & product
- Biofuel plant field & operations engineers
- Biofuel plant field technicians
- Biofuel production & Biomass:
- Biofuel production technicians
- Biological technicians (SOC 19-4021)
- Biological technicians (SOC 19-4021)
- Biologists (SOC 19-1020)
- Biomethane gas collection system operators
- Biomethane gas collection system technicians
- Building controls system technicians
- Building performance specialists:
- Buildings/Deconstruction: Green building and retrofit architects
- Buildings/Retrofitting of existing
- Bus and truck mechanics and diesel engine specialists (SOC 49-3031)
- Cement masons and concrete finishers (47-2051)
- Chemical Engineers (SOC 17-2041)
- Chemical technicians (SOC 19-4031)
- Chemical technicians Scientists (SOC 19-4031)
- City and regional planning aides (SOC 19-4061.01)
- Civil engineers (17-2051) – agriculture/irrigation/water supply
- Civil engineers (including structural design) (SOC 17-2051)
- Civil Engineers (SOC 17-2051)
- Climate change and energy policy
- Commercial and industrial designers (27-1021)
- Commercial and industrial energy field
- Compliance analysts or Energy regulation
- Computer software engineers (SOC 15-1030)
- Conservation scientists (SOC 19-1031)
- Construction and building inspectors (SOC 47-4011)
- Construction carpenters (SOC 47-2031)
- Construction managers (including Project manager for construction and design work) (11-9021)
- Control and valve installers and repairers, except mechanical door (SOC49-9012)
- Cost estimators (SOC 13-1051)
- Crop and Horticulture workers
- Design and construction of new green
- Designers
- Destruction technicians
- Development Managers
- Economists (SOC 19-3011)
- Electric motor, power tool and related repairers (SOC 49-2092)
- Electrical & electronics engineering technicians (SOC 17-3023)
- Electrical and electronic equipment assemblers (SOC 51-2022)
- Electrical and electronics repairers, powerhouse substation and relay (49-2095)
- Electrical drafters (SOC 17-3012)
- Electrical drafters (SOC 17-3012)
- Electrical drafters (SOC 17-3012)
- Electrical engineers (including Lighting product and equipment engineers) (SOC 17-2071)
- Electrical Engineers (SOC 17-2071)
- Electrical engineers (SOC 17-2071)
- Electrical or hybrid vehicle technicians Hydrogen/fuel cell vehicle technicians

- Electrical power-line installers and repairers (SOC 49-9051)
- Electricians (47-2011)
- Electricians (SOC 47-2111)
- Electromechanical equipment assemblers (SOC 51-2023)
- Electro-mechanical technicians (SOC 17-3024)
- Electro-mechanical technicians (SOC 17-3024)
- Electronic equipment installers, repairers, motor vehicles
- Electronics & electrical engineering technicians (including lighting product manufacturing (SOC 17-3023))
 - Electronics and electrical engineering technicians (SOC 17-3023)
 - Electronics Engineers (SOC 17-2072)
 - Electronics engineers (SOC 17-2072)
 - Emission control technology specialist
 - Energy conservation representatives Energy managers and analysts
 - Energy trading specialist Conservation, cleanup and safety
 - Engine and other machine assemblers (SOC 51-2031)
 - Engine and other machine assemblers (SOC 51-2031)
 - Engineering managers Roofers (SOC 11-9041)
 - Engineering technicians, except drafters, all other (SOC 17-3029)
 - Engineering technicians, except drafters, all other (SOC 17-3029)
 - Engineers
 - Engineers
 - Environment engineers (SOC 17-2081)
 - Environmental biologists
 - Environmental chemists
 - Environmental compliance inspectors (SOC 13-1041.01)
 - Environmental compliance inspectors (SOC 13-1041.01)
 - Environmental construction engineers
 - Environmental engineering technicians (SOC 17-3025)
 - Environmental engineering technicians (SOC 17-3025)
 - Environmental engineering technicians (SOC 17-3025)
 - Environmental engineering technicians (SOC 17-3025)
 - Environmental engineers (SOC 17-2081)
 - Environmental engineers (SOC 17-2081)
 - Environmental health & safety engineers and technicians
 - Environmental laboratory technicians
 - Environmental researchers
 - Environmental science & protection techs, incl. health (SOC 19-4091)
 - Environmental science and protection technicians, including health (SOC 19-4091)
 - Environmental scientists and specialists, including health (SOC 19-2041)
 - Farm and home management advisors (25-9021)
 - Farm, ranch and other agricultural managers (SOC 11-9011)
 - Farmers and ranchers (11-9012)
 - Fiberglass laminators and fabricators (SOC 51-2091)
 - Field energy consultants
 - First-line supervisors/managers of agricultural (SOC 45.1011.07)
 - First-line supervisors/managers of construction (47-1011)
 - Forest and conservation technicians (SOC 19-4093)
 - Fueling facility technician
 - General and operations managers (SOC 11-1021)
 - Geoscientists (19-2042)
 - Geothermal Electrical Engineers
 - Geothermal heat pump machinists
 - Geothermal Mechanical Engineers
 - Geothermal Operations Engineers
 - Geothermal plant efficiency operators
 - Geothermal plant installation technicians
 - Geothermal power plant structural
 - GIS Analysts Water and wastewater treatment

- Glaziers (SOC 47-2121)
- Green building and retro-fitting project
- Green building maintenance engineer
- Green building operations and
- Green building operators and engineers
- Green landscape architects
- Green product manufacturing
- Hazardous materials removal workers (47-4041)
- Heating and air conditioning and refrigeration mechanics and installers (49-9021)
- Heating, air conditioning, and refrigeration (SOC 49-9021)
- Helpers-carpenters (SOC 47-3012)
- Helpers-electricians Plumbers & HVAC/R (SOC 47-3013)
- Helpers-installation, maintenance and repair workers (SOC 49-9098)
- Helpers-installation, maintenance, & repair workers (SOC 49-9098)
- Helpers-pipe layers, plumbers, pipefitters (47-3015) & steamfitters Meter readers
- Helpers-pipe layers, plumbers, pipefitters, and steamfitters (47-3015)
- Helpers-pipelayers, plumbers, pipefitters and steamfitters (SOC 47-3015)
- Hybrid powertrain development engineers
- Hydrogen fuel cell engineers All renewables:
- Hydrogen Hydrogen plant operator and operations
- Hydrologists (19-2043)
- Industrial Engineers (SOC 17-2112)
- Industrial Engineers (SOC 17-2112)
- Industrial machinery mechanics (49-9041)
- Industrial machinery mechanics (hydroelectric machinery mechanics) (SOC 49-9041)
- Industrial safety and health engineers (SOC 17-2111.01)
- Inspectors, testers, sorters and weighers (SOC 51-9061)
- Instrument and control technicians
- Instrumentation/Controls/Electrical (ICE)
- Insulation workers, floor, ceiling and wall Electricians (47-2131)
- Interior designers (27-1025)
- Landfill gas collection system operators
- Landfill gas system technicians
- Landscape architects (SOC 17-1012)
- Machinists (51-4041)
- Machinists (SOC 51-4041)
- Maintenance and repair workers, general (SOC 49-9042)
- Maintenance and repair workers, general (SOC 49-9042)
- Maintenance and repair workers, general (SOC 49-9042)
- Maintenance workers, machinery (SOC 49-9043)
- Mapping technicians (17-3031.02)
- Mapping technicians (17-3031.02)
- Materials engineers (SOC 17-2131)
- Materials engineers (SOC 17-2131)
- Mechanical engineering technicians (including HVAC/R product manufacturing technicians) (SOC 17-3027)
- Mechanical engineering technicians (SOC 17-3027)
- Mechanical engineering technicians (SOC 17-3027)
- Mechanical engineering technicians (SOC 17-3027)
- Mechanical engineers (including Water systems designers and engineers, and HVAC/R engineers) (SOC 17-2141)
- Mechanical engineers (SOC 17-2141)
- Mechanics and Installers
- Meter readers, utilities (43-5041)
- Mining and geological engineers (SOC 17-2151)
- Mining and geological engineers, including mining safety engineers (SOC 17-2151)
- Occupational health and safety specialists (SOC 29-9011)
- Occupational health and safety specialists (SOC 29-9011)
- Occupational health and safety technicians (SOC 29-9012)

- Ocean Wave Power Turbine Technicians
- Other energy engineers (Proposed SOC 17- 2179 Other energy engineers)
- Other energy engineers (Proposed SOC 17-2179 Other energy engineers)
- Plumbers (SOC 47-2181)
- Plumbers, pipefitters, and steamfitters (SOC 47-2152)
- Plumbers, pipefitters, and steamfitters (SOC 47-2152)
- Plumbers, pipefitters, and steamfitters (SOC 47-2152)
- Power distributors (SOC 51-8012)
- Power plant operators (SOC 51-8013)
- Powertrain control systems & software engineers
- Program managers, environmental construction
- Refuse and recyclable material collectors (53-7081)
- Renewable energy consultants Industrial green systems and retrofit
- Renewable energy technicians
- Residential air sealing technicians
- Resource conservation or Energy efficiency managers
- Roofers (SOC 47-2181)
- Sales engineers (SOC 41-9031)
- Sales engineers (SOC 41-9031)
- Sales representatives, wholesale and manufacturing, technical and scientific products (SOC 41-4011)
- Sales representatives, wholesale and manufacturing, technical and scientific products (SOC 41-4011)
- Sheet metal workers (SOC 47-2211)
- Soil and plant scientists (SOC 19-1013)
- Soil and water conservationists (SOC 19-1031.01)
- Solar Commercial Installation Engineers
- Solar Installation Electrician Foreman
- Solar Installation Electricians
- Solar Manufacturing Technicians
- Solar PV Installers
- Solar Sales Estimators
- Solar Systems Designers
- Solar Systems Engineering Technicians
- Solar Systems Engineers
- Solar Thermal Systems Installers
- Solar Thermoelectric Plant Managers
- Solid waste management/recycling
- Specialist Conservation policy analysts
- Specialists GIS Technicians
- Specialists Residential energy field auditors (Proposed SOC 25-9022 Home energy auditors)
- Stationary Engineers and Boiler Operators (SOC 51-8021)
- Stationary engineers and boiler operators (SOC 51-8021)
- Statisticians (SOC 15-2041)
- Structural metal fabricators and fitters (SOC 51-2041)
- Structural metal fabricators and fitters (SOC 51-2041)
- Sustainability program specialists (Proposed SOC 13-1112 Sustainability program specialists) Energy trading specialist Air emissions permitting engineer
- Sustainable development specialists
- Sustainable development specialists
- systems technicians
- Team assemblers (SOC 51-2092)
- Team assemblers (SOC 51-2092)
- Technicians/Electrical technicians:
- Telemarketers Accountants (KSA of tax incentives, rebates, etc) (SOC 41-9041)
- Trades and Extraction workers
- Traffic technicians (SOC 53-6041)
- Transportation managers (SOC 11-3071.01)

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| | <ul style="list-style-type: none"> • Urban and regional planner (SOC 19-3051) • Urban and regional planning specialists (including transportation planning aides) • Urban renewal managers • Utilities (SOC 43-5041) • Waste reduction consultants • Water & liquid waste plant & system operators (SOC 51-8031) • Water conservation consultants • Water conservation or water efficiency • Water purification systems service • Water resource consultants • Water shed conservation and management • Water supply and distribution • Water/wastewater consultants • Weatherization operations managers • Weatherization specialists or technicians • Welders, cutters, solderers and brazers (SOC 51-4121) • Welders, Cutters, Solderers, and Brazers (SOC 51-4121) • Welding, soldering, and brazing machine setters, operators and tenders (SOC 51-4122) • Wind Farm Electrical Systems Designers • Wind Field Technicians • Wind Power Manufacturing Technicians • Wind Power Plant Project Engineers • Wind Turbine Electrical Engineers • Wind Turbine Machinists • Wind Turbine Maintenance Technicians • Wind Turbine Mechanical Engineers • Maintenance workers, machinery (SOC 49-9043) |
| <p>Green Industries Cited</p> | <ul style="list-style-type: none"> • Utilities (NAICS 22) • Construction (NAICS 23) • Manufacturing (NAICS 31-33) • Wholesalers (NAICS 42) • Professional, Scientific, and Technical Services (NAICS 54) • Administrative and Waste Services (NAICS 56) • Public Administration (NAICS 92) • Retail (NAICS 44) • Transportation and Warehousing (NAICS 48-49) • Hydroelectric Power Generation (NAICS 221111) • Other Electric Power Generation (NAICS 221119) • Electric Bulk Power Transmission and Control (NAICS 221121) • Electric Power Distribution (NAICS 221122) • Steam and air-conditioning supply (NAICS 221330) • Power and Communication Line and Related Structures Construction (NAICS 237130) • Roofing Contractors (NAICS 238160) • Electrical Contractors and Other Wiring Installation Contractors (NAICS 238210) • Plumbing, Heating, and Air-Conditioning Contractors (NAICS 238220) • Chemical Manufacturing (NAICS 325000) • Semiconductor Machinery Manufacturing [Machines to manufacture solar panels] (NAICS 333295) • Turbine and Turbine Generator Set Units (NAICS 333611) • Semiconductor and Related Device Manufacturing [Solar panel and fuel cell manufacturing] (NAICS 334413) <ul style="list-style-type: none"> • Automatic Environmental Control Manufacturing (NAICS 334512) • Storage Battery Manufacturing (NAICS 335911) • Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers [Solar panel sales] (NAICS 423720) • Engineering Services (NAICS 541330) • Survey and Mapping Services (NAICS 541370) • Testing Laboratories (NAICS 541380) • Environmental Consulting Services (NAICS 541620) |

- Other Scientific and Technical Consulting Services (541690)
- Research and Development in the Physical, Engineering, and Life Sciences (except biotechnology) (NAICS 541712)
- Other Electronic and Precision Equipment Repair and Maintenance (NAICS 811219)
- Commercial and Industrial Machinery (except automotive and electronic) Repair and Maintenance (NAICS 811310)
- Electric Power Generation, Transmission & Distribution [Energy Conservation, Planning, and Consulting] (NAICS 221100)
- Natural Gas Distribution (NAICS 221200)
- Construction of Buildings (NAICS 236000)
- New Single-Family Housing Construction (except operative Builders) (NAICS 236115)
- New Multifamily Housing Construction (except operative Builders) (NAICS 236116)
- New Housing Operative Builders (NAICS 236117)
- Residential Remodelers (NAICS 236118)
- Industrial Building Construction (NAICS 236210)
- Commercial and Institutional Building Construction (NAICS 236220)
- Specialty Trade Contractors (incl. Electrical Contractors) (NAICS 238000)
- Electrical Contractors and Other Wiring Installation Contractors (NAICS 238210)
- Plumbing, Heating, and Air Conditioning Contractors (NAICS 238220)
- Finish Carpentry Contractors (NAICS 238350)
- All Other Specialty Trade Contractors (NAICS 238990)
- Roofing Contractors (NAICS 238990)
- Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing (NAICS 333400)
- Heating Equipment (except warm-air furnaces) manufacturing (NAICS 333414)
- Electric Lamp Bulb/ Parts Manufacturing (NAICS 335110)
- Residential Electric Lighting Fixture Manufacturing (NAICS 335121)
- Commercial, Industrial, Institutional Lighting Manufacturing (NAICS 335122)
- Other Lighting Equipment Manufacturing (NAICS 335129)
- Power, Distribution, and Specialty Transformer Manufacturing (NAICS 335331)
- Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers (NAICS 423720)
- Residential Property Managers (NAICS 531311)
- Nonresidential Property Managers (NAICS 531312)
- Architectural Services (NAICS 541310)
- Landscape Architectural Services (NAICS 541320)
- Engineering Services (541330)
- Drafting Services (541340)
- Building Inspection Services (NAICS 541350)
- Industrial Design Services (NAICS 541420)
- Environmental Consulting Services (NAICS 541620)
- Cities and Counties (NAICS 921000)
- Administration of Environmental Programs (NAICS 924000)
- All Other Misc. Crop Farming (NAICS 111998)
- Other Aquaculture (NAICS 112519)
- Timber Tract Operations (NAICS 113110)
- Forest Nurseries and Gathering of Forest Products (NAICS 113210)
- Support Activities For Crop Production (NAICS 115110)
- Support Activities for Forestry (NAICS 115310)
- Other Oilseed Processing (NAICS 311223)
- Fats and Oils Refining and Blending (NAICS 311225)
- Rendering and Meat Byproduct Processing (NAICS 311613)
- Cellulosic Organic Fiber Manufacturing (NAICS 325221)
- Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing (325300)
- All Other Industrial Machinery Manufacturing (NAICS 333298)
- Engineering Services (NAICS 541330)
- Testing Laboratories (NAICS 541380)
- Environmental Consulting Services (NAICS 541620)
- Other Scientific and Technical Consulting Services (NAICS 541690)

- Research and Development in Biotechnology (NAICS 541711)
- Administration of Conservation Programs (NAICS 924120)
- Electric Power Distribution (NAICS 221122)
- Natural Gas Distribution (NAICS 22120)
- Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use (NAICS 334512)
- Motor and Generator Manufacturing (NAICS 335312)
- Transportation Equipment Manufacturing (NAICS 336000)
- Automobile Dealers [Service Departments] (NAICS 441100)
- Other Gasoline Stations (NAICS 447190)
- General Freight Trucking (NAICS 484100)
- Specialized Freight Trucking (NAICS 484200)
- Urban Transit Systems [incl. commuters rail systems] (NAICS 485100)
- Interurban and Rural Bus Transportation (NAICS 485200)
- Port and Harbor Operations (NAICS 488310)
- Engineering Services (NAICS 541330)
- Survey and Mapping Services (NAICS 541370)
- Testing Laboratories (NAICS 541380)
- Process, Physical Distribution, and Logistics Consulting Services [Relates to Logistics] (NAICS 541614)
- Environmental Consulting Services (NAICS 541620)
- Other Scientific and Consulting Services (NAICS 541690)
- Automotive Mechanical and Electrical Repair and Maintenance NAICS (811110)
- Other Automotive Repair and Maintenance (NAICS 811190)
- Administration of Urban Planning and Community and Rural Development (NAICS 925120)
- Water Supply and Irrigation Systems (NAICS 221310)
- Sewage Treatment Facilities (NAICS 221320)
- Water and Sewer Line and Related Structures Construction (NAICS 237110)
- Other Heavy and Civil Engineering Construction [Relates to channel construction] (NAICS 237990)
- Commercial Laundry, Drycleaning, and Press Machine Manufacturing (NAICS 333312)
- Automatic Environmental Control Mfg. for Residential, Commercial, and Appliance Use (NAICS 334512)
- Household Refrigerator and Home Freezer Manufacturing (NAICS 335222)
- Engineering Services (NAICS 541330)
- Testing Laboratories (NAICS 541380)
- Environmental Consulting Services (NAICS 541620)
- Other Scientific and Technical Consulting Services (NAICS 541690)
- Solid Waste Collection (NAICS 562111)
- Hazardous Waste Collection (NAICS 562112)
- Other Waste Collection (NAICS 562119)
- Hazardous Waste Treatment and Disposal (NAICS 562211)
- Remediation Services (NAICS 562910)
- Materials Recovery Facilities (NAICS 562920)
- All Other Miscellaneous Waste Management Services (NAICS 562998)
- Administration of Air and Water Resource and Solid Waste Management Programs (NAICS 924110)
- Survey and Mapping Services (NAICS 941370)
- Testing Laboratories (NAICS 541380)
- Environmental Consulting Services (541620)
- Other Scientific and Technical Consulting Services (NAICS 541690)
- Environmental, Conservation, and Wildlife Services (NAICS 813312)
- Administration of Air and Water Resource and Solid Waste Management Programs (NAICS 924110)
- Administration of Conservation Programs (NAICS 924120)
- Administration of Urban Planning and Community and Rural Development (NAICS 925120)
- Regulation and Administration of Transportation Programs (NAICS 926120)
- Regulation and Administration of Communications, Electric, Gas, and Other Utilities (NAICS 926130)

Keywords

Green Economy; Community Colleges

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| Legislation Cited | AB 32 - California's Global Warming Solutions Act, 2006 AB 118 – Alternative and Renewable Fuel and Vehicle Technology Program American Recovery and Reinvestment Act |
| Bibliography (Y/N) | Y |
| Reviewer Name/Org | D. Costello / Labor Market Information Division |

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