GOING GREEN

The Vital Role of Community Colleges in Building a Sustainable Future and Green Workforce

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Ideas Changing Lives

Going Green: The Vital Role of Community Colleges in Building a Sustainable Future and Green Workforce

- Purpose of Going Green Publication
  - > Highlight innovative strategies and practices used by community colleges to address climate change solutions and green workforce development;
  - > Offer information on the fastest growing sectors and jobs in the green economy;
  - > Start the dialogue on the role of community colleges in creating a sustainable future; and
  - > Present useful web sites and resources.

The Promise of the Green Economy

- A recent Pew Charitable Trusts report indicates that the green economy, more specifically the clean energy economy, is poised to expand significantly
- Venture capital investment has grown in clean technology from $1 billion in 2005 to $12.6 billion during the past 3 years
- Between 1998 and 2007, jobs in the clean economy grew by 9.1 percent, while total jobs grew by just 3.7 percent
- Estimates range wildly on the potential of green jobs, dependent on climate policies, incentives, investments, and technology

What is the Green Economy?

- The term “green” is prevalent in our national dialogue and has been broadly applied to many things.

- In the context of education and workforce development, it is important to define the green economy to understand the impact of occupational requirements

- One definition that is widely used is:

The green economy encompasses the economic activity related to reducing the use of fossil fuels, decreasing pollution and greenhouse gas emissions, increasing the efficiency of energy usage, recycling materials, and developing and adopting renewable sources of energy.

What is a Green Job?

- No common definition of a green job
- Green economy activities and technologies will have different effects on different occupations
- Span a variety of skills, educational backgrounds and occupations and as many of the promising 21st Century jobs, require more than a high school diploma but less than a bachelor's degree.

Greening of Occupations

- According to DOL O*NET Study, a better approach to defining green occupations may be to define the "greening of occupations"

Three categories of Greening of Occupations:

- **Green Increased Demand Occupations:** The work context may change but the tasks themselves do not. Example: increase demand for electrical power installers and repairers related to energy efficiency

Greening of Occupations – DOL

- **Green Enhanced Skills Occupations:** The essential purposes of the occupation remain the same, but the skill sets, methods, occupational profile, and credentials have been altered. Example: Architects and LEED certification

- **New and Emerging Green Occupations:** An occupation could be entirely new or born from an existing occupation. Example: Energy Auditors

Greening of Occupations

- Many of the occupations today fit into the green enhanced skills occupations category
- Although some of the new and emerging green occupations will require new industry-recognized credentials and training programs, many will only require modifications to existing programs and courses to integrate green skills.
- At this point, there are very few novel green jobs, just many greener ones
- The majority of job trajectories in green industries can be built into traditional career pathways.

Green Industry Sectors



- These green occupations span many key economic sectors including, but not limited to:
- Renewable Energy Generation
- Transportation and Alternative Fuels
- Energy Efficiency – Green Construction and Buildings
- Manufacturing
- Agriculture and Forestry
- Environmental Protection

Fastest Growing Sectors in the Clean Energy Economy

Energy Efficiency

- Energy Efficiency – Buildings and Construction
  - > Sector encompasses activities such as:
    - Green building design and construction
    - Renovation of existing buildings
    - Energy management
    - Manufacture of renewable materials
  - > Jobs in Energy Efficiency (many green increased demand occupations):
    - Systems Technician
    - Green Designer and Architect
    - Skilled Energy Efficient Construction Trade Worker

Renewable Energy Generation

- Greatest development and growth within green economy
- 24 states and DC have enacted renewable portfolio standards
- Estimated that a 30% increase of renewable energy, which will equal 40% of total domestic power generation.

Solar Energy

- Active and Passive Solar Technologies include photovoltaics (solar panels) and solar heating and cooling

- Currently, 850 American companies manufacture, install, and sell solar system components

- Types of Jobs in Solar Energy:
  - Solar Photovoltaic Installer
  - Solar Power Plant Technicians
  - Solar Engineer/Designer

Renewable Energy

- **Wind Power**
  - Fastest growing form of electricity generation in the world
  - Estimated potential wind energy exist in 46 of the 50 states
  - Jobs in Wind include:
    - Wind Turbine Electrical Engineers
    - Wind Farm Electrical Systems Designers
    - Wind Turbine Manufacturing

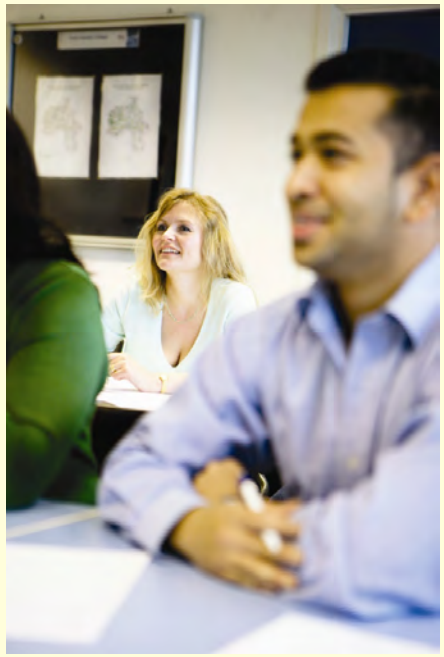
Renewable Energy

- **Geothermal Energy**
  - > Most geothermal reservoirs in AK and HI. Growing in popularity as heat source in the Northeast
  - > Forecasts have estimated an 87% increase in geothermal energy production, about 35,000 new jobs
  - > Jobs include (green enhanced skills occupations) :
    - Geothermal Heat Pump Machinists
    - Construction and Drilling Equipment Operators
    - Surveyors

Alternative Fuels

- **Biofuels**
  - Bioenergy technologies use renewable plant and animal-based materials to create liquid fuel, solid fuel, and other energy products.
  - Most skill sets for biofuel refinery jobs are similar to those in traditional chemical manufacturing
  - Biofuels Jobs include:
    - Ethanol Plant Technician
    - Chemical Plant Technician
    - Biodiesel Laboratory Technician

Examples of Educating and Preparing a Green Workforce

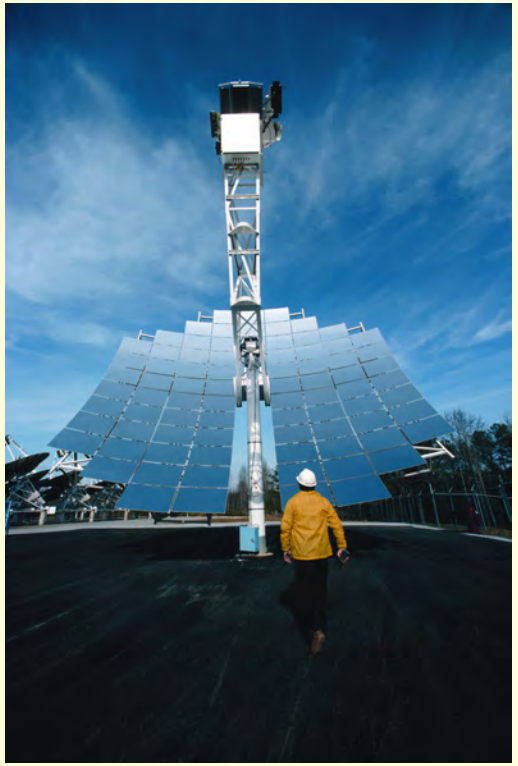


Los Angeles Unified School District

- The Los Angeles Unified School District's small learning communities (SLCs)/career academies are in the process of adapting their current programs working with LA Trade Technical College.
- Adapting existing programs through updating of curricula and adding courses to their 50 existing SLCs that are related to green jobs including: 1) environmental sciences, 2) architecture/engineering and construction, 3) math/science/technology, and 4) advanced transportation.
- Building greater involvement of industry to expand a full range of work experience opportunities for students.

Cape Cod CC, Barnstable, MA

- AAS degree in Environmental Technology with electives in:
  - Solar and Wind Energy
  - Energy Efficiency
  - Energy Auditing



Santa Fe CC, Santa Fe, NM

- SFCC Sustainable Technology Center
  - Credit and non-credit certificates
    - Environmental Technologies
    - Green Building Construction
    - Solar Energy
  - AAS degree in Environmental Technologies
    - Water Conservation
    - Solar Energy

Iowa Lakes CC, Estherville, IA

- AAS degree program in Wind Turbine Operation and Maintenance
  - Owns and operates turbine at college and uses as educational laboratory
  - Incorporating energy efficiency methods into building trades programs
  - Summer Internship
  - One-year diploma option

Central Carolina CC Pittsboro, NC

- AAS degree in Alternative Energy Technology:
  - > Biofuels testing and production
  - > Constructing a pilot scale plant that will be able to produce both biofuel and ethanol

Lansing CC, Lansing, MI

- USDOE $1M Grant for Alternative Energy Initiative
  - Incorporation of Alternative Energy into Existing Curricula and Campus Sustainability Efforts
  - Courses in:
    - Auto: Hybrid Vehicles
    - Auto: Internal Combustion Engines By Fuel Cells
    - HVAC and Building Construction: Energy Management Systems
    - Geothermal, Solar, and Wind Energy
  - A.A.S. degrees in alternative energy technology and energy specialist and Alternative Energy Engineering Technology (AEET) Certificate

Hudson Valley CC, Troy, NY

- Center for Energy Efficiency and Building Science
  - > Incorporating energy efficiency methods into building trades programs
  - > Introductory credit-free course on the fundamentals of photovoltaic system design and installation

Challenges of Educating and Preparing the Future Green Workforce

- Training and educating workers for jobs that do not currently exist in the labor market – full potential of green jobs will be realized with changes in policies, investments, and technology
- Labor market information on the new and emerging economy is not easily obtainable
- There is no standardization of credentials, multiple institutions and training systems providing certificates or certifications, which may or may not recognized by employers
- The few standards that have emerged are mostly for advanced professionals and those at the lower levels of the career ladder such as North American Board of Certified Energy Practitioners (NABCEP) are difficult to obtain for those with low reading and math levels.

What do community colleges need to educate and prepare the future green workforce?

- Curriculum Standards and Green Industry Certifications
- Clearly Articulated Green Education Pathways
- Best Practices
- Labor Market Information
- Strategic Partnerships with Green Employers,K-12 system, State Energy/ Environment Agencies, Workforce System
- Understanding of the sustainability vision of the state, region, and locality

What is different about Green?

- Eco Literacy
- New Strategic Partnerships
- Spans Many Sectors – Connectivity
- Living Laboratory
- Ability to Engage Youth Earlier – Environmentally Aware
- Need to create jobs at the same time as training for them
- Amount of Funding
- Using Green to Connect More Youth to STEM Careers
- Obsession with all Things Green

Questions?