



SHADES OF GREEN JOBS

Definitions and Issues

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“Green” is pervasive and is difficult to isolate and measure

- Most green industries and occupations are not exclusive
 - Accountant at a wind mill manufacturer
 - Wind mill technician at a petroleum company
- There are multiple objectives for green activities
 - Reduce greenhouse gas emissions (CO₂, methane)
 - Use energy sources that are not food sources
 - Energy independence
 - Lower energy costs
 - Improve energy efficiency
 - Save the planet



Green has many shades

- The concept of production vs. practice matters
 - Produce (wind blades, solar panels)
 - Practice (green hotels)
- The concentration of “greenness” matters (green weight)
 - Industries (share of wind turbines vs. conventional turbines in product line)
 - Occupations (share of plumber’s time devoted to green activities vs. non-green)



Issues with current industry and occupational taxonomies

- Industry employment codes do not distinguish between green and nongreen activities within industries
 - Green building construction vs. traditional building construction
- Occupational codes do not distinguish between green and nongreen skills, knowledge and abilities
 - Electrician installing solar panels vs. regular electrician
- New and emerging industries and occupations take time to grow to a level measurable by statistical methods



Issues with definitions

- Green could include industries in the broad economy outside of energy (such as construction) or it could be a subset of the energy industry (which would exclude reforestation, land restoration)
- Green could include clean energy (nuclear), or green energy (solar), or alternative energy (corn ethanol)
- Green could be only energy efficiency and renewable energy
- Green could include only emerging industries (oil from algae) or could include existing industries relabeled green (wastewater treatment)
- Green could include suppliers to green industries as green (auto parts suppliers)



Issues with definitions, continued

- Green jobs may have social and economic attributes attached
 - Good wages (U.S. Secretary of Labor Solis testimony to Senate)
 - Opportunities for at-risk youth (Title X of Green Jobs Act)
 - Pathways out of poverty (Title X of Green Jobs Act)



Issues with green occupations

- Some do not require new skills
 - Reforestation
- Some will use existing skills with new applications
 - New green methods (tight seal to insulate house)
 - New green materials (install Energy Star appliance)
- Some only need skills upgrade
 - Short on-the-job training
 - Industry certifications (LEED, NABCEP solar electric)



ARRA green vs. broader green

- American Recovery and Reinvestment Act funds these green activities (narrower focus)
 - Energy efficiency
 - Renewable energy
 - Weatherization (insulation)
 - Smart grid (power transmission lines)
 - Water quality
 - Research



Green Jobs Act

Title X of Energy Independence Act of 2007 (Green Jobs Act)

- Energy efficiency and renewable energy industries include:
 - energy-efficient building, construction, and retrofits industries;
 - renewable electric power industry;
 - energy efficient and advanced drive train vehicle industry;
 - biofuels industry;
 - deconstruction and materials use industries;
 - energy efficiency assessment industry serving the residential, commercial, or industrial sectors;
 - manufacturers that produce sustainable products using environmentally sustainable processes and materials.



ARRA green vs. broader green, continued

- Broadly defined green activities (not included in ARRA)
 - New residential / commercial green construction
 - Recycling
 - Remediation
 - Reclamation
 - Restoration



Commonly cited green industries by state workforce agencies

- Renewable energy (solar, wind, biomass, geothermal, ocean)
- Energy efficiency (weatherization, building retrofits)
- Alternative auto fuels and advanced storage batteries
- Green construction and remodeling
- Consulting services (environmental consulting, Energy Services Companies)
- Environmental restoration and preservation (clean up mines)
- Recycling and waste management (reuse of water)
- Agriculture (crops and biomass for biofuels)
- Manufacturing (Energy Star appliances, re-manufacturing)



Unique but not commonly cited green industries by state workforce agencies

- Hydroelectric power generation (harms the environment)
- Nuclear power generation (safety, waste disposal)
- Clean coal (emerging technology associated with prohibitive costs)
- Natural and sustainable product manufacturing (such as bamboo, recycled materials)
- Green hotels (FL Green Lodging Program)
- Organic farming (no-till, organic fertilizer)
- Transportation vehicle manufacturing (public transit, electric, hybrid cars, bicycles)
- Government (environmental compliance, regulation)



Efforts to define green jobs at the state and federal levels

- National Association of State Workforce Agencies (NASWA) Green Workgroup

(Florida member)

- Leverages efforts across states and works to create a consensus definition
- Collects state definitions (14 states)
- Lists green occupations and industries
- Maintains comprehensive database of over 80 reports (<http://www.labormarketinfo.edd.ca.gov/?pageid=1032>)



Efforts to define green jobs at the state and federal levels, continued

- U.S. Department of Labor, Bureau of Labor Statistics Green Workgroup (FL is a member)
 - Develop definition of green jobs (directly impacting production) to help with training needs in the future
 - Develop alternative gathering and estimating methods
 - Develop plan to collect and publish data
 - Builds on ongoing efforts by states and input from O*NET



AWI LMS green job activities

- Collected definitions of “green jobs” and “green industries” from other states and published reports to create a national inventory
- Prepared for a possible green jobs survey (reviewing surveys by other states, creating lists of potentially green industries and occupations)
- Developed Green Jobs Flyer based on research
- Dedicated green activities section on labormarketinfo.com
- Joined Greenforce Florida Team (led by Florida Department of Education)
- Participated in Growing Florida Green (a statewide marketing program aimed at consumers managed by Cox Communications)



AWI green job activities, continued

- Joined NASWA Green Workgroup
- Joined U.S. Department of Labor BLS Green Workgroup
- Participated in Florida's Great Northwest WIRED Region Renewable Energy Advisory Council



Options for measuring emerging green jobs in Florida

- Wait for federal industry and occupational classification systems to catch up (4-10 years)
- Conduct a baseline survey and periodic updates to measure growth
- Measure real-time openings on job boards (employflorida.com and The Conference Board's Help-Wanted OnLine (HWOL))



Washington state green survey

- Pre-determined four key green areas:
 - Energy efficiency
 - Preventing and reducing pollution
 - Renewable energy
 - Mitigating or cleaning up pollution
- Identified 47,194 green jobs in the private sector (1.6 percent of total private state employment)
 - 9,500 private-sector employers participated in the survey
 - Direct employment only



Washington state green survey, continued

- Energy efficiency accounts for over half of all green employment; 70 percent of this is in construction
- Top five industries by green employment
 - Specialty trade contractors 13,985
 - Professional and technical services 7,456
 - Crop production 7,270
 - Construction of buildings 6,743
 - Waste management and remediation 2,918
- Next step: conduct a survey to assess how a green carpenter's skills are significantly different from a traditional carpenter



Washington state green survey, continued

- The top 10 identified occupations account for 56 percent of all green jobs
 - Farmworkers and laborers
 - Electricians
 - Construction laborers
 - Carpenters
 - Agricultural workers, all other
 - Heating, Air Cond., and Refrig. mechanics and installers
 - Civil engineers
 - Plumbers, pipefitters, and steamfitters
 - Architects, except landscape and naval
 - Mechanical engineers



New and emerging green occupations

- Energy auditor
- Energy manager
- Energy efficiency specialist
- Sustainable development manager
- Lighting efficiency professional
- Carbon reduction manager
- Advisor for management and energy
- Distributed energy manager
- Geothermal designer
- Greenhouse gas assessor
- Intelligent building specialist
- Solar fabrication technician
- Solar energy system installer
- Solar commercial installation technician
- Solar thermoelectric plant manager
- Solar operations engineer
- Wind field technician
- Wind generating installer
- Hybrid and fuel cell automotive technicians

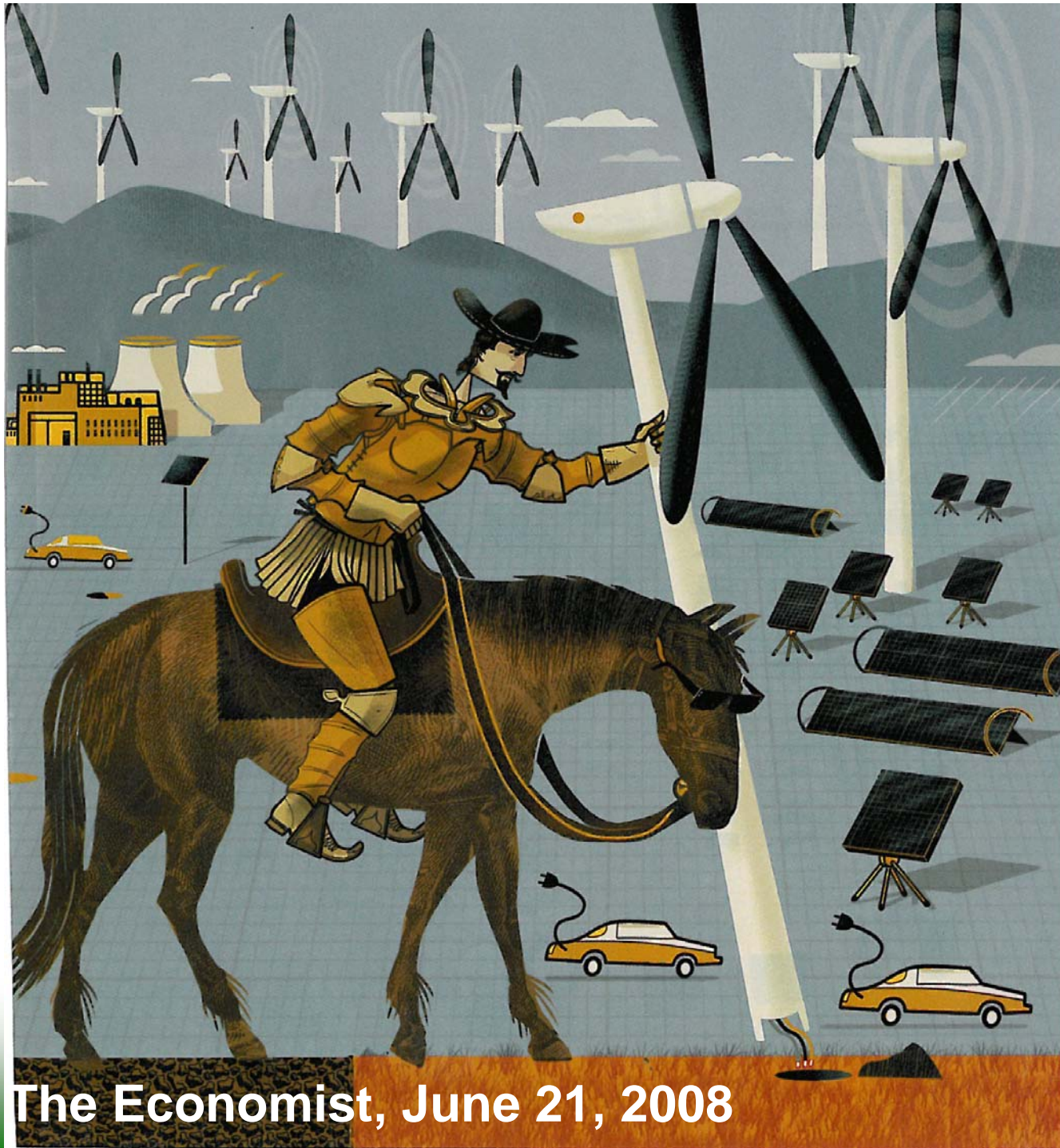


New and emerging green occupations, continued

- Hydrogeologist
- Geothermal power generation engineer
- Geothermal plant operator
- Landfill gas system technician
- Biomethane gas collection system technician
- Biomass plant operator
- Carbon sequestration plant operator
- Smart grid engineer
- Environmental compliance specialist
- Energy conservation representative
- Green building and retrofit architect
- Weatherization operations manager
- Carbon emissions specialist
- Carbon trader
- Emission reduction manager
- Climatologist
- Greenhouse gas emissions verifier
- Biomass collectors



THE END



The Economist, June 21, 2008