Green Jobs:
Opportunities & Options

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Wisconsin State Assembly
March 3, 2009
Green Jobs

- Green Jobs Defined
- Opportunities
- Energy, Green Building, Transportation
- State Drivers
  - Policies
  - Incentives
- WI Green Jobs
Green Jobs

- Well-paid, career track jobs that contribute directly to preserving or enhancing environmental quality
  --Apollo Alliance, 2008

- **Green Jobs & Salaries**
  - High school, trade school, apprenticeships = Skilled blue collar
  - Advanced degrees
  - Electricians and welders to software engineers
  
  - solar operations engineer ($87,400)
  - solar installation electrician foreman ($58,236)
  - wind field service technician ($44,344)
  - field energy consultant ($60,076)
"How do I know this isn't just a one-time roll in the switchgrass?"
Opportunity

“The fossil fuel period is only an era, actually just a transition between two periods in which all human societies have been, or will be, powered by sustainable energy resources.”

-- Don Aitken
Green Jobs – Historical & Projections

- Jobs in environmental protection
  - $39B 1970 to $301B 2003
  - Increased more rapidly than GDP over same period

- EE&RE Jobs 2006
  - 8.5 million new jobs
  - nearly $970 billion in revenue
  - $100 billion+ in industry profits

- Projection EE&RE Jobs 2030
  - 40 million jobs
  - $4.5 trillion in revenue


<table>
<thead>
<tr>
<th>Expenditures (billions of 2003 dollars)</th>
<th>Jobs (thousands)</th>
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<tbody>
<tr>
<td>1970</td>
<td>39</td>
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<tr>
<td>1975</td>
<td>77</td>
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<tr>
<td>1980</td>
<td>121</td>
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<tr>
<td>1985</td>
<td>158</td>
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<td>1990</td>
<td>204</td>
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<td>1995</td>
<td>235</td>
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<td>2003</td>
<td>301</td>
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## American Recovery and Reinvestment Act of 2009

### Energy Efficiency and Renewable Energy Funding

<table>
<thead>
<tr>
<th>Area</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>EERE Research, Development, Demonstration &amp; Deployment</td>
<td>$2,500,000,000</td>
</tr>
<tr>
<td>Weatherization Assistance Program</td>
<td>$5,000,000,000</td>
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<tr>
<td>State Energy Program</td>
<td>$3,100,000,000</td>
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<tr>
<td>Advanced Battery Manufacturing</td>
<td>$2,000,000,000</td>
</tr>
<tr>
<td>Advanced Fueled Vehicles Pilot Program</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>Transportation Electrification</td>
<td>$400,000,000</td>
</tr>
<tr>
<td>Energy Efficient Appliances Rebates &amp; Energy Star</td>
<td>$300,000,000</td>
</tr>
<tr>
<td><strong>TOTAL EERE</strong></td>
<td><strong>$16,800,000,000</strong></td>
</tr>
</tbody>
</table>
Post Oil Restructuring – Smart Growth

Myth: We can become energy independent and remain car-dependent

Remedies:
- Make our living places walkable
- Connect them with public transit
- Rebuild railways and electrify them

Myth: Time equals Money

Remedies:
- Switch from large scale petro-agriculture to local sustainable agriculture
- Establish local networks of economic interdependency
- Create jobs while saving resources – a triple bottom line economy
Energy Sustainability = Energy Efficiency + Conservation + Renewables

Benefits of Renewable Energy
- Stabilizes energy costs
- Creates job opportunities
- Keeps dollars in local economy
- Preserves quality of life, air, water, land
- Reduces reliance on foreign and polluting sources of energy
Assess and Analyze Options

RE&EE generates about 70% more jobs than the oil and gas sector

Energy Efficiency 1st-cheaper
- Retrofitting existing stock
- Smart meters, smart grid
- Smart infrastructure (roads, traffic lights, mass transit)
- Energy Star electronics, appliances

Renewable Energy
- Solar, wind, biofuels, geothermal, biogas, biomass

Analysis Metrics
$ , kWh, Therms, Carbon

Microturbines-Sauk Co landfill
Energy

- **Government can:**
  - Improve energy profile of govt facilities and operations
  - Adopt policies and set targets for energy efficiency and green design, renewable energy purchase and installations
  - Reduce fossil fuel use in public transit, purchase electric and hybrid vehicles
  - Support & expand rail transit
  - Alter state building codes, specifications and standards
Green Building

Green building promotes human, environmental & economic health

Related Jobs
- Energy efficiency and Renewables
- Lighting
- Green roofs, green walls
- Porous paving
- Recycled materials
- Sustainably harvested wood
- Construction
- Retrocommissioning
- C&D recycling
- Deconstruction
Wisconsin Green Building

- LEED- Leadership in Energy and Environmental Design – national green building rating system
  - www.usgbc.org
- 236 LEED certified and registered green buildings in Wisconsin

Wisconsin DNR Northeast Regional Headquarters
Howard, Wisconsin
Berners-Schober Associates Architects
LEED® Gold
Wisconsin Green Buildings

Northland Pines High School
Eagle River, WI  LEED Gold

- $115 per SF = 23% under national median
- naturally lit classrooms
- 40% better than code energy efficiency
- nontoxic finishes and products
- clean air monitoring
- water-saving dual flush toilets & waterless urinals
- on-site stormwater management and native plant species
- recycling of 83% of construction waste
Green Building

**Strategies**

- Adopt green building policies to promote green design and construction, upgrades to existing buildings
- Provide incentives and guidelines for the private sector to build green
- Influence specifications, codes & standards
- Educate staff, developers & community

**Government Green Building Policies**

www.shwec.uwm.edu/governmentgreen
Government can provide:

- direct investment in activities that will create green jobs
- incentives or requirements that drive private sector investment into the green economy
Policies – Direct Investments

- Energy efficiency retrofits of existing state buildings
- Solar and other renewable energy installations on state buildings and properties
- Green building standards on new construction
- Public transit infrastructure development
- State fleet conversion to hybrids, alternatives vehicles and fuels
- Green purchasing from local vendors; Regional green purchasing pools

Recovery Act Invests $9.3 Billion to Expand High-Speed Rail in America

UCS, March 2006- Increasing WI Renewable Portfolio Standard -960 jobs added
Policies -- Incentives

- Incentives or requirements to drive private sector investment
  - Tax incentives, streamlined permitting for private building owners that invest in energy efficiency, renewable energy, or green building
  - Innovative financing for business investment in renewable energy, efficiency, green building, alternative vehicles, or green infrastructure
  - Green building codes, energy codes and other requirements for new and existing buildings (e.g. Zero Net Energy)
Energy Independent Community Pilots

Awards
23 Communities in Counties of:
- Brown
- Ashland / Bayfield
- Polk
- Wood
- Columbia
- Rock
- Grant
- Waukesha
- Sauk

Strong Contenders
- Polk Co
- Dane CO
- Lac de Flambeau
- Kaukauna
- Prairie du Chien
- Eau Claire
- Outagamie
- Monona
- Altoona
- Middleton
- Steven Point

70+ WI munis passed 25x25 resolutions
Zero Net Energy Policies

Massachusetts – Zero Net Energy Task Force
- ZNE for commercial and residential buildings by 2030

California Long Term Energy Efficiency Strategic Plan
- Encouraging residential construction to be ZNE by 2020
- Commercial buildings to be ZNE by 2030

Federal NZE Commercial Building Initiative (US DOE)
- Public/private partnerships to advance ZNE commercial buildings

Austin, TX – Zero Energy Homes Initiative
- By 2015 all new single-family homes ZNE capable
- Use 65% less energy than homes in 2007 by code
Green Jobs Training

American Reinvestment & Recovery Act: $500 million to fund job training programs in energy efficiency and renewable energy

- Habitat for Humanity & MREA
  - On the job training solar installations
  - 20 installations, Milwaukee
- Habitat Restore- deconstruction training

- **Green Jobs & Salaries**
  - solar operations engineer ($87,400)
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  - wind field service technician ($44,344)
  - field energy consultant ($60,076)
Wisconsin Green Jobs

- **Me2- Milwaukee Energy Efficiency Program**
  - Train underserved-energy efficiency installations, est. 500 jobs
  - Auditors-contractors; entry - highly skilled
- **Renewables Component Manufacturing Jobs**: ~35,133

<table>
<thead>
<tr>
<th>Location</th>
<th># of Firms</th>
<th>Jobs Wind</th>
<th>Jobs Solar</th>
<th>Jobs Geothermal</th>
<th>Jobs Biomass</th>
<th>Jobs Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>2,289</td>
<td>30,010</td>
<td>19,298</td>
<td>3,396</td>
<td>3,875</td>
<td>56,579</td>
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<tr>
<td>Indiana</td>
<td>1,321</td>
<td>25,180</td>
<td>7,485</td>
<td>3,191</td>
<td>3,365</td>
<td>39,221</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>1,331</td>
<td>25,179</td>
<td>4,943</td>
<td>2,037</td>
<td>2,974</td>
<td>35,133</td>
</tr>
<tr>
<td>Michigan</td>
<td>2,050</td>
<td>24,350</td>
<td>6,644</td>
<td>1,502</td>
<td>2,281</td>
<td>34,777</td>
</tr>
</tbody>
</table>

- **Climate Change related job growth & increased wages**: 304,000
  - Carpenters, electricians, welders, operations managers, machinists, industrial truck drivers, energy auditors, software engineers, EE construction, roofers
WI Green Jobs

**Tower Tech Systems**, Manitowoc
- Large scale manufacturer of utility-scale wind towers
- In former military submarine factory
- Doubled its workforce of 70 in 15 months

**Renewegy, LLC**, Oshkosh
- Manufacturer of high efficiency wind turbines (founded 2008)
- Received $250,000 WI Technology Venture Fund Loan (Jan. 2009)
- 60 jobs may be created

**Paradigm Sensors**, Milwaukee
- Developed biodiesel analyzer – OEI grant, R&D w/ Marquette U
- 12 jobs

**WI Clean Energy Job Growth**

**WI can grow 35,133 new jobs by developing clean energy** – solar, wind, biomass, geothermal

Majority are manufacturing jobs for component parts.

WI Green Jobs

- **Ruud Lighting**, Racine
  - LED street lights – 50% more efficient
  - Added 12 jobs

- **Flambeau River Paper**, Park Falls
  - Saved 300 jobs
  - Fossil fuel independent – biomass boiler
  - Building biorefinery- add 100 jobs

- **Bubbling Springs Solar**, Menominee
  - Solar thermal panel manufacturer
  - 6 jobs, hiring 2 more

- **Project Home** Low Income Weatherization
  - Tripling workforce

- **Dave’s Brewfarm**, Wilson, WI
  - Renewable energy + rural development
  - Wind-brewed beer- 20kW wind turbine
  - Also SHWH, geothermal, greywater
Wisconsin Resources

- UW-Extension / SHWEC
- UW-Extension/ CCED
- COWS- Center on WI Strategy
- Energy Center of Wisconsin
- Focus on Energy/Public Benefits
- Midwest Renewable Energy Association
- WI State Organized Labor
- Wisconsin Energy Conservation Corporation
- WI Green Building Alliance
- WI Technical College System
- WasteCap Wisconsin
- US Green Building Council