



Renewable Energy Trends and Workforce Development in Washington State

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Study Purpose

Improve the state's ability to supply a well qualified workforce to design, build, operate and maintain renewable energy facilities and equipment.



Study Elements

- Global, National, State and Regional Trends in Renewable Energy
- Employer Data (27)
- Workforce Implications
- Identify RE Education and Training in State



Wild Horse Wind/Solar Project – Kittitas County
Photo courtesy of Puget Sound Energy

Clean Energy Investments

Global:

- Global investment in clean energy was \$13.5 billion in 2008

In the U.S.:

- Investment in U.S. clean energy was \$3.3 billion in 2008



*Workers service a wind turbine at Nine Mile Canyon Site
Photo courtesy of Energy Northwest*

Source: Clean Edge and New Energy Finance, 2009

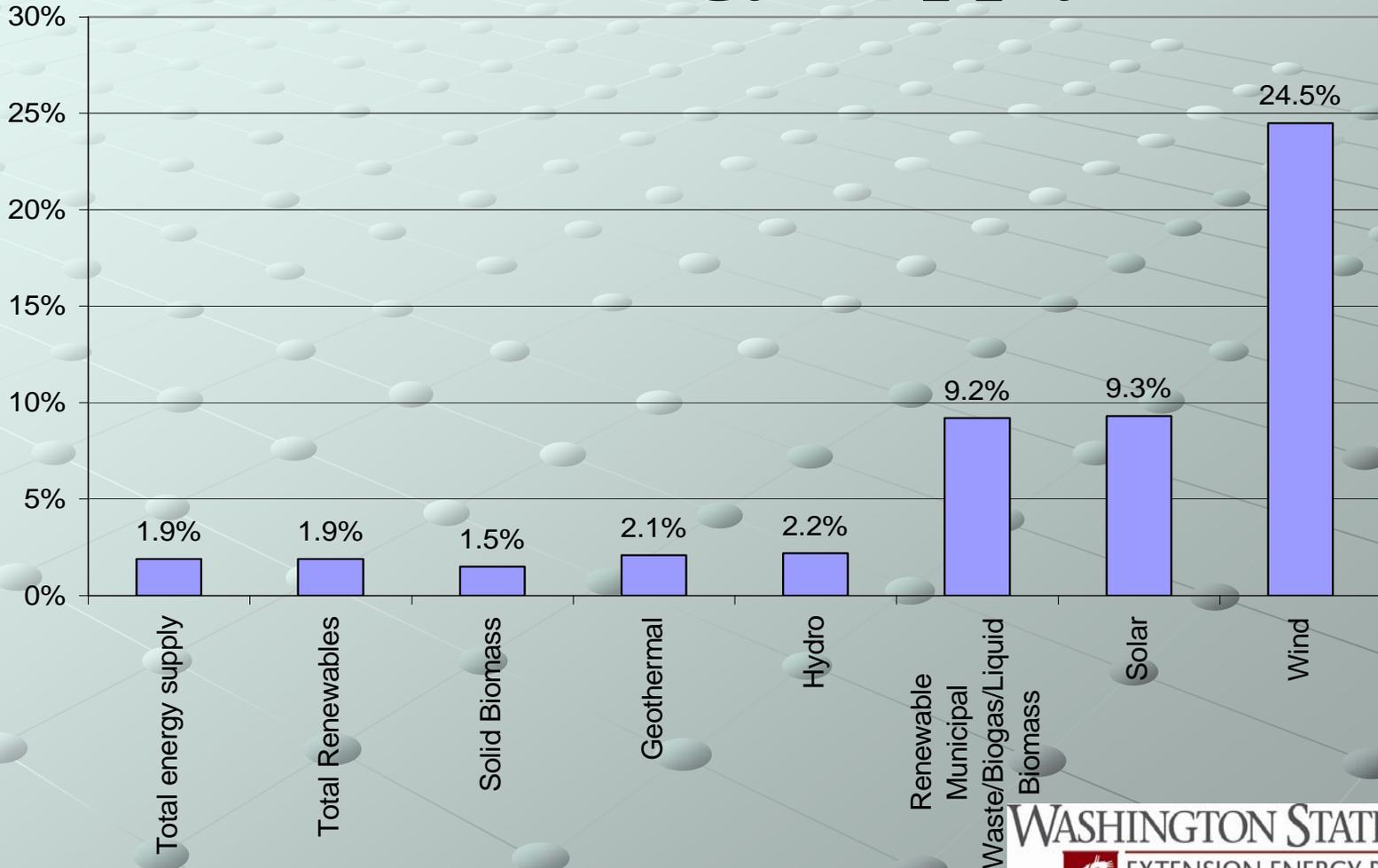
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EXTENSION ENERGY PROGRAM

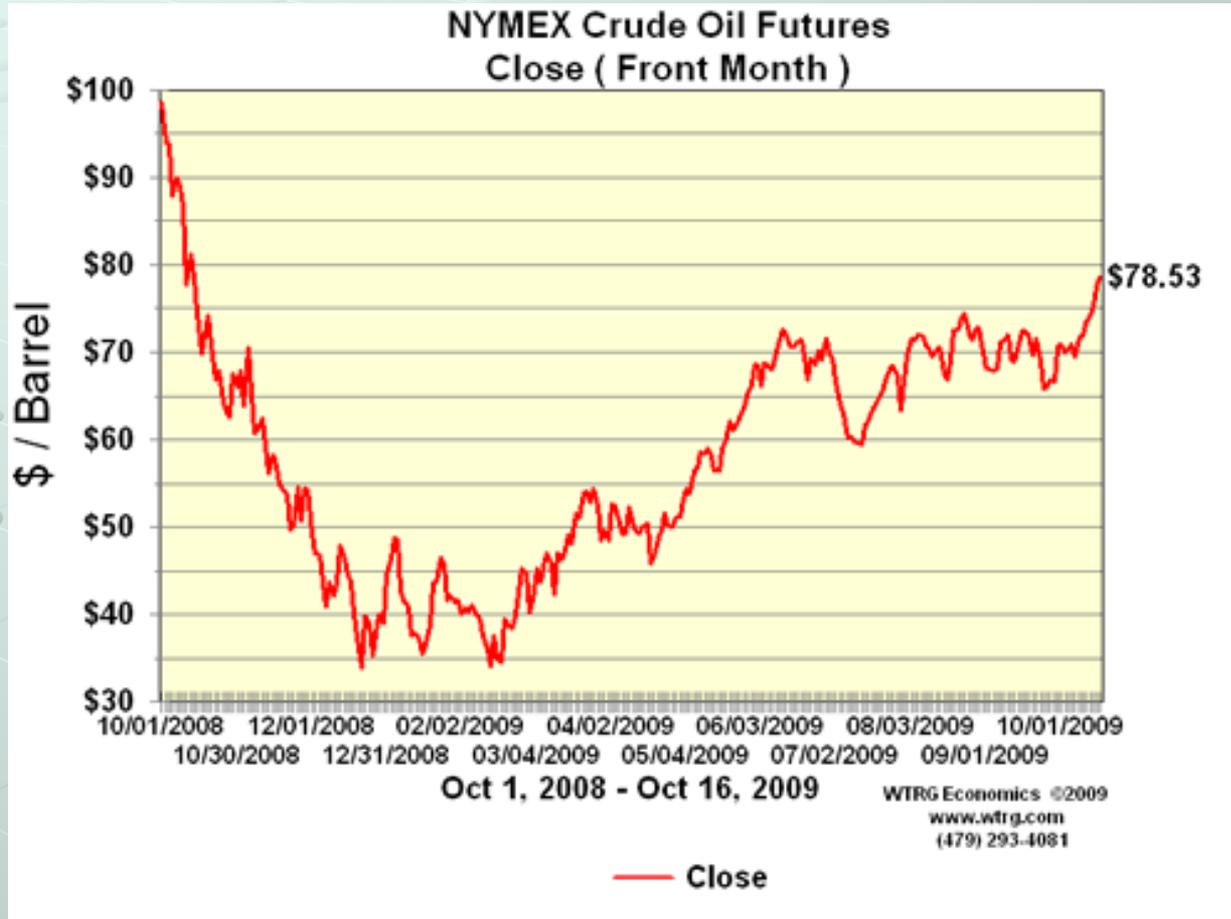


Annual Growth Rates In World Renewable Energy Supply 1990-2006



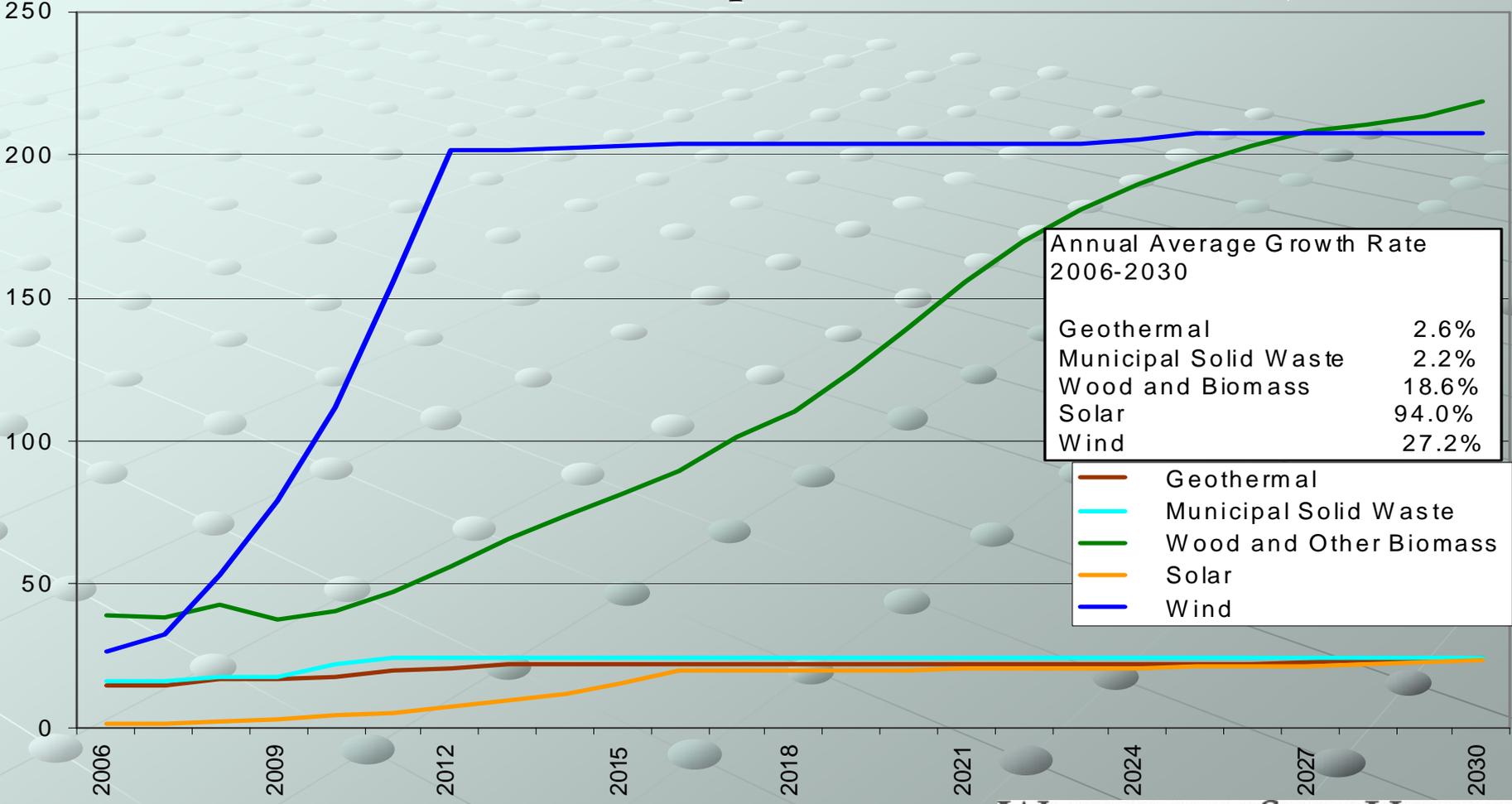
The Cost of Oil – Updated

(High=\$140 Barrel in July 2008)



U.S. Non-Hydro Renewable Electricity Generation 2006-2030

(includes effects of post-stimulus investments)

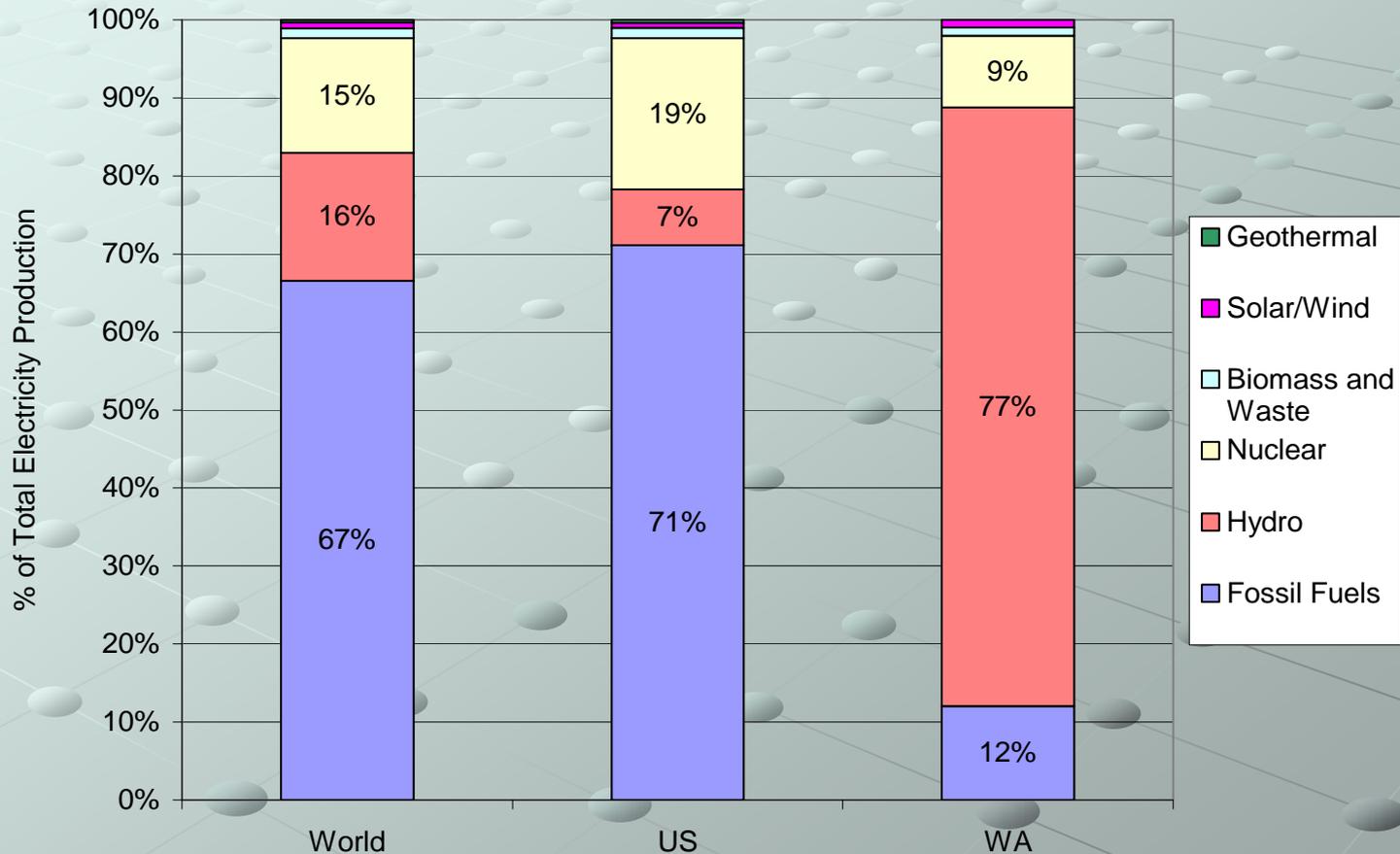


Geothermal	2.6%
Municipal Solid Waste	2.2%
Wood and Biomass	18.6%
Solar	94.0%
Wind	27.2%

- Geothermal
- Municipal Solid Waste
- Wood and Other Biomass
- Solar
- Wind



2006 Resource Mix for Electric Power Generation





Industry Trends: Employer Perspectives

- Federal/state policies driving growth
- Uneven patterns of development
- Renewable energy employers optimistic
 - Recession has had negative impact, but viewed as a “*temporary setback.*”



Workforce Issues:

Employer Perspectives

● Future workforce shortages

- All employers reported a lack of experienced workers in the labor market

● Need for a multi-skilled workforce

● Core skills often lacking

● Significant interest from youth:

- *Solar employer: “I get an application a day from energetic young people”*



Workforce Issues:

Education and Training

- Lack of renewable education and training (at all levels, including STEM)
- Capacity limited
- Training delivery options—balance of distance options and applied learning

Conclusions

- Renewable Energy sectors will experience long-term growth, change
- Current economic conditions will likely moderate new investment and growth, but there is momentum
- State policies and Green Economy goals impact renewable sectors differently; many opportunities and challenges
- Retirements, demographic trends, and inadequate education-training capacity will tighten labor market
- Careers abound for students, workers who are prepared



*Solar panels on the roof of Wenatchee Valley College
Photo courtesy of Chelan County PUD*

Thank You

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WSU Energy Workforce Research Reports:

<http://www.energy.wsu.edu/apps/Workforce.aspx>

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Solar Industry Findings: Working Conditions

- Can be physically challenging (PV Installer)
- Frequently working in remote locations
- Tying into the grid poses critical safety risk

Solar Industry Findings:

Key Solar Occupations

- Solar System Designers/Design Engineers
- Installer/Roofer/Glazier/Framer/Electricians
- Solar Hot Water Installers/Plumbers
- Others:
 - Sales
 - Systems Integration
 - Project Aggregators



Solar Industry Findings: Skills

- Most employers listed similar skills which are unique to solar electrical work
- Unique skills in solar include: astronomy, shading analysis, roofing techniques, glazing skills and structural analysis

Solar Industry Findings:

Unique Skills

- Skill needs differ from other crafts:
 - *“The best solar installer would be a roofer, an electrician, and a plumber. But no one is going to do all of those trainings. And they don’t really need all that training. There are parts of all those professions that are needed.”*

Solar Industry Findings:

Training Shortage

- All employers agreed more solar-specific training is needed for engineers, electricians and technicians
- Shortage of both design and installation training:
 - *“We need a two-year program in the Northwest to see more solar designers”*

Solar Industry Findings: Training Topics Identified by Employers

Topic	Description
Solar Site Survey	Topics include determining the solar path, shading and integration of the solar system into buildings
Basic Communication/Public Interaction	Client management, customer service, presentation, oral and written communication
Business Skills/Sales	Cost analysis, interest rates, incentives, sales
Project Management	Organizing and managing projects including budgeting, materials, managing employees
Electrical Codes	Knowledge of all applicable codes and requirements
Basic Design	Ability to read plans, draw up plans, use CAD programs
Passive Solar Design	Integrating passive solar designs into structures and systems