Renewable Northwest Project: 
*RNP’s Workforce Initiative*

WORKING IN
RENEWABLE ENERGY INDUSTRY

Students
2009
Goals of RNP’s Workforce Initiative

LONG TERM:
To provide long term, systematic, sustainable and effective strategies to meet the identified workforce needs and respond to existing and projected shortages.

SHORT TERM:
Offer Internship Programs For Students to Gain Exposure, Interest and Experience in the Industry.
Objectives: Proper siting, advance policies promoting new renewables, expand retail markets.

Geography: OR, WA, ID, MT

Members: Business, non-profit, educational
Renewable Northwest Project Members

- Wind Companies
- Solar Companies
- Geothermal Companies
- Planning and Engineering Companies
- Environmental organizations
- Consumer protection groups
- Energy consulting firms
Renewable Energy

“It is a fairly rare initiative that is good policy, good economic development, and good for the environment, but renewable energy development is that rare gem.”

- Billions in new capital being invested;
- A net increase of 1,250 new jobs with each $100 million investment in renewable energy resources.  

April 2005, Oregon Renewable Energy Plan
Between 2001-07, the U.S. wind generating capacity expanded at a rate of 49% per year on average.

The U.S. has over 20,000 MW of wind capacity online, enough to power over 5.3 million homes; this represents only 2% of total US electricity mix.

The Pacific NW has the potential to generate over 137,000 average Mega Watts of electricity from wind - or enough for over 102 million homes.

965 MW of wind energy is now operating in Oregon.

Over 2,200 jobs now in Wind Energy in OR and WA.
Supporting Renewable Energy Makes Economic Sense

Oregon is becoming a leader in the clean energy economy which:

- Provides economic benefits to communities through:
  - Construction and Operations Jobs
  - Tax revenues flowing to counties, particularly rural ones
  - Induced business activity
  - Landowner revenue - On average, $2,000-$7,000 annually for each wind turbine.
  - Carbon/Pollution Offset

- Reaps economic benefits as every $100 million invested in renewable energy results in $200 million in economic benefits, and increases tax revenues by approximately $1 million.

- Capture jobs - Renewable energy and energy efficiency is currently generating 8.5 million jobs and could reach 40 million U.S. jobs by 2030.
Carbon-Free Prosperity 2025 Report**

Five clean-energy sectors provide high-paying jobs and vital new economic base for Oregon and Washington:

- **Solar PV Manufacturing** - up to 22,560 new jobs;
- **Wind Power Development** - up to 6,000 new jobs;
- **Green Building Design** - up to 16,834 new jobs;
- **Sustainable Bioenergy** - up to 10,419 new jobs; &
- **Smart-Grid Technologies** - up to 7,000 new jobs.

**Oct. 08 Report by two leading clean-tech organizations — Clean Edge and Climate Solutions.**

RNP WIND WORKFORCE INITIATIVE
Good News for Students: Shortages Of Qualified Applicants

RNP members:

- Have identified workforce as one of their top business concerns;
- Are experiencing difficulty finding qualified local applicants;
- Need applicants with multi-disciplinary skill sets.
- Desire to work with public and private universities to address these needs.
Improve Qualifications=Use Interns
Good for Students

- Allows you to test theory learned in the classroom in an actual work situation;
- Learn about the field to see if is a good fit for you personally;
- Find out how you like working with the specific company or organization;
- Discover what skill sets you may need to obtain or improve to be more successful;
- Provides enhanced opportunity of future employment in the field and with that company if internship is successful for both parties.
Job Openings and Needs in Every Stage of a Project

- Planning and Development – Site Identification
- Public Involvement & Outreach
- Permitting and Sitting
  - Environmental Assessment
  - Design and Engineering
  - Legal and Policy Work for Permitting
- Construction Labor
- Operation and Maintenance
Types of Degree Jobs Needed in Wind Energy Industry

- Engineering
  - Civil, Mechanical, Electrical, Construction Management
- Business/Economics/Math Degrees
  - Project and Contract Management
  - Masters in Business Administration
  - Market and Economic Analysis
- Political Science/Policy
- Environmental Sciences/Physics
- Meteorology
Business of the Wind: Types of Jobs

- Asset Manager
- Project Manager
- Manager of Policy and Regulatory Affairs
- Wind Project Developer
- Senior Analyst/Structuring Analyst
- Senior Business Developer
STAGES OF WIND PROJECTS

1. 20% Wind Scenario
2. Turbine Technology
3. Manufacturing, Materials, & Jobs
4. Transmission & Integration
5. Siting and Environment Effects
6. Markets

RNP WIND WORKFORCE INITIATIVE
Skills Required over Project Cycle

Site Identification
- Meteorologists
- Environmental
- GIS
- Civil Engineers

Development & Permitting
- Project Managers/Developers
- Meteorologists
- Environmental
- GIS
- Civil Engineers
- Business analysts
- Attorneys -- Land use and real estate

Market Assessment & Power Sales
- Business
- Quantitative analysis
- Policy
- Attorneys - sales contracts

Project Construction
- Environmental
- GIS
- Engineering (civil, electrical)
- Construction
- Project Management

Asset Management
- Meteorologists
- Mechanical Engineers
- Quantitative analysis
- Contract Management
- Operations and Maint.
Examples of Opportunities

Environmental Sciences, Engineering and Policy - Permit Applications

Klondike III/Biglow Canyon Wind Integration Project

PROJECT DESCRIPTION:
BPA has decided to interconnect 300 megawatts (MW) of electricity generated from the proposed Klondike III Wind Project being by PPM Energy, Inc. and to interconnect 400 MW of electricity from the Biglow Canyon Wind Farm, owned by Portland General Electric and located north and east of the proposed Klondike III Wind Project, to the Federal Columbia River Transmission System. To interconnect these wind projects, BPA will build and maintain a new 345 kV substation located near Biglow Canyon, Oregon, and a 161 kV transmission line between the new substation and the existing substation at Keizer, Oregon in Marion County, Oregon.

CURRENT STATUS:
BPA prepared an Environmental Impact Statement (EIS), completed and approved by BPA headquarters, in November 2007. Bonneville Power Administration, Klondike III/Biglow Canyon Wind Farm proposal, and the adjacent transmission line was completed in the spring 2007.

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503-230-3790

DOCUMENTS:
- ROD (165 KB pdf) (10/25/06)
- ROD Cover Letter (137 KB pdf) (11/05/06)
- Final EIS Public Letter (135 KB pdf)
  - Appendix A - Cumulative Impacts Analysis For Avian Resources From Proposed Wind Projects In Sherman County, Washington (544 KB pdf)
  - Appendix B - Visual Resources Technical Memorandum (101 KB pdf)
  - Appendix C - Electrical Effects (436 KB pdf)
  - Appendix D - Assessment Of Research Regarding EMF And Health And Environmental Effects (142 KB pdf)
  - Appendix E - Contractor Disclosure Forms (465 KB pdf)
  - Map 1: Project Vicinity (566 KB pdf) (04/06/06)
  - Map 2: Alternatives Eliminated From Consideration (284 KB pdf) (04/06/06)
  - Map 3: Transportation System (709 KB pdf) (04/06/06)
  - Map 4: Recreational Opportunities (273 KB pdf) (04/06/06)
  - Map 5: Soils (1.3 MB pdf) (04/06/06)
  - Map 6: Waterway/Wetland Crossings (709 KB pdf) (04/06/06)
  - Map 7: Sensitive Visual Resources (298 KB pdf) (04/06/06)
  - Map 8: Visibility Analysis for Oregon (3.67 MB pdf) (08/06/06)
  - Map 9: Visibility Analysis for Washington (2.52 MB pdf) (07/11/06)

Appendix G - The Oregon Energy Facility Siting Council Site Certificate for the Klondike Wind Project, June 30, 2006 (144 KB pdf)

  - Attachment A - Biglow Canyon Wind Farm Monitoring and Mitigation Plan, June 30, 2006
  - Attachment B - Biglow Canyon Wind Farm Revegetation Plan, June 30, 2006
  - Attachment C - Biglow Canyon Wind Farm Mitigation Plan, June 30, 2006

Appendix I - The Oregon Energy Facility Siting Council Site Certificate for the Biglow Canyon Wind Farm, June 30, 2006 (144 KB pdf)

Appendix J - Wind Turbine Locations (1.16 MB pdf)

Figure 2: Proposed Wind Turbines (195 KB pdf) (04/06/06)

Map 1: Project Vicinity (566 KB pdf) (04/06/06)

Map 2: Alternatives Eliminated From Consideration (284 KB pdf) (04/06/06)

Map 3: Transportation System (709 KB pdf) (04/06/06)

Map 4: Recreational Opportunities (273 KB pdf) (04/06/06)

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Map 8: Visibility Analysis for Oregon (3.67 MB pdf) (08/06/06)

Map 9: Visibility Analysis for Washington (2.52 MB pdf) (07/11/06)

Updated Project Map (416 KB pdf) (03/31/05)

Project Scoping Letter (47 KB pdf) (02/24/05)

Updated Project Map (274 KB pdf) (02/23/05)

Updated Project Map (273 KB pdf) (02/15/05)

Project Scoping Letter (45 KB pdf) (02/15/05)

Comment Form (13 KB pdf) (02/15/05)

Notice of Intent to Prepare an EIS (27 KB pdf) (02/09/05)

Project Map (191 KB pdf) (01/20/05)
Examples of Opportunities
Environmental Sciences - Field Studies
Examples of Opportunities
Environmental Sciences and Engineering - Permit Applications
Examples of Opportunities
Environmental Sciences and Engineering - Permit Applications
Examples of Opportunities
Environmental Sciences - Avian Studies
Examples of Opportunities
Environmental Sciences - Avian Studies
Examples of Opportunities

Environmental Sciences - Visual Analysis
Examples of Opportunities
Meteorology - Project Siting Analysis
Examples of Opportunities
Business Risk Analysis

Basic Information
- Project organisation
- Liaison with authorities
- Turn-key project
- Financing
- Environmental impact statement (EIS)
- Insurance
- Financial key parameters

Hazard Identification
- Workshops and Interviews
  - RAMBØLL
  - Partners, clients
- Prompt list
  - Authorities
  - Environment
  - Construction investments
  - Construction delays
  - Operation and maintenance
  - Time schedules
  - Electricity production
  - Electricity price
  - Wind characteristics
  - Turbine characteristics in operation
  - Grid characteristics
  - Turbine availability
  - Subsidies
  - Accidents during construction
  - Accidents during operation

Risk Modeling
- Financial model set-up
  - Construction
  - Operation
  - Insurance
  - xx: ----
  - yy: ----
- Uncertainty modelling

Risk Presentation
- Probability distributions of:
  - NPV
  - IRR
  - ROE
- Sensitivity for important parameters
Examples of Opportunities

Business Economic / Risk Analysis
Examples of Opportunities Engineering
Examples of Opportunities
Construction Management
Direct jobs and parts during construction

- Truck drivers, crane operators
- Earth moving, cement pouring
- Wind Turbine Components
- Management and support
Examples of Opportunities
Construction Management

RNP WIND WORKFORCE
INITIATIVE
WEBSITE LINKS TO RE JOBS

GENERAL RE JOB SITES

- Wind Careers  www.careersinwind.com/
- Power Plant Pro  www.powerplantpro.com/power-career-builders.php
- Energy jobs Network  www.energyjobsnetwork.com
- Indeed.com  www.indeed.com/wind
- Renewable Energy Jobs  www.energyplacement.com/jobs
- Clean Tech  http://jobs.cleanedge.com/
RNP MEMBERS WITH CAREER WEBSITES

- CH2M-Hill  [www.ch2m.com/corporate/work_with_us/career](http://www.ch2m.com/corporate/work_with_us/career)
- Horizon Wind  [www.horizonwind.com/company/jobs.aspx](http://www.horizonwind.com/company/jobs.aspx)
INTERNERSHIP WEBSITES

Internships
- www1.eere.energy.gov/education/internships
- www.repp.org/employment.html
- www.nrel.gov/employment/student_interns.html
- www.idealist.org/if/as/Internship

RNP MEMBER INTERN INFORMATION
- RNP Workforce Page www.rnp.org
- David Evans & Associates www.deainc.com/coops\asp
- GE Energy www.ge.com/careers/students/internships.html
WIND INDUSTRY LINKS

Renewable Northwest Project
www.rnp.org

American Wind Energy Association (AWEA)
www.awea.org/

US Dept. of Energy Wind Program
www.windpoweringamerica.gov/

National Wind Coordinating Collaborative
www.nationalwind.org/

Utility Wind Integration Group (UWIG)
www.uwig.org/
WIND RESEARCH AND RESOURCES

RESEARCH
US DOE Wind Energy Research  www.windpoweringamerica.gov/
National Wind Research Center at NREL  www.nrel.gov/wind/
Oregon Built Environment & Sustainable Technologies Center  http://oregonbest.org/

EDUCATIONAL LINKS
AWEA Wind Web Tutorial  www.awea.org/faq/
Student and Educator Resources for Wind  www.nrel.gov/learning/sr_wind.html
National Energy Education Development Project (NEED)  www.NEED.org
Wind Power Maps.org - Northwest Wind Maps  www.windpowermaps.org

WIND POTENTIAL
INTERESTED IN RNP’S WORKFORCE INITIATIVE

See the RNP website for more information:

www.RNP.org/workforce/