

## **The REPP Labor Calculator**

The Renewable Energy Policy Project (REPP) has developed a tool that calculates the number of direct jobs resulting from renewable energy development under RPS legislation or other programs to accelerate renewable energy development. The calculator is based on a survey of current industry practices to assess the number and type of jobs that will result from the enactment of an RPS.

The survey examined manufacturing, installation, and operating and maintenance (O&M) practices by occupational category as well as by project activities for each renewable energy technology analyzed. The spreadsheet-based format of the calculator, with all labor data and RPS assumptions clearly laid out, provides a very transparent tool for estimating job creation.

Once the required installed capacity to meet an RPS is specified, the calculator determines the number and types of jobs in each of those major areas of activity by year per installed MW of capacity. The calculator estimates the total direct labor required to manufacture, install, operate and service wind power and distributed solar photovoltaic (PV) systems, and of the total direct labor to collect, transport, and process biomass fuel for use in biomass co-fired coal power plants. The assessment also develops estimates of the operation and maintenance labor requirements of geothermal power plants, based on literature review. The calculator allows for considerable changes to assumptions about the types of renewables used to meet the RPS requirements.

At this time REPP is still developing the surveys of other renewable technologies, such as biomass, solar thermal, geothermal, and other renewable technologies. Until that work is completed, the types of technologies that can be considered is limited.

Output from the labor calculator has been used to support RPS development in Nevada and Washington State, as well as to estimate job creation potential in the biopower industry in Florida. The Nevada AFL-CIO used the REPP job estimates (see next page) in 2002 testimony to the Nevada Public Service Commission stating that among a number of benefits, a Nevada RPS would provide an important source of economic and job diversification. In addition, the labor calculator can be used to identify potential “skills gaps”, markets where the demand for skilled workers exceeds the available trained workforce. In this case, a training and certification program should be a part of the planning and implementation for an RPS.

The REPP tool, it should be noted, is a job calculator and not an economic model. It shows the direct jobs that could be captured by the state as a result of an RPS. It does not address the secondary economic effects of an RPS. The tool is transparent and easily understood; it allows for considerable testing of alternative scenarios; and, it will show the potential local economic impact that can be expected as a result of the decision to require local renewable generation supply a portion of the electricity used by consumers in the state.

**APPENDIX A: Renewable Energy Labor Calculator—Nevada RPS Example, 2003-2013**

<b>User Inputs</b>												
<b>Generation</b>	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Total Retail Sales (1000 KWh)	27,864,303	28,282,268	28,706,502	29,137,099	29,574,156	30,017,768	30,468,035	30,925,055	31,388,931	31,859,765	32,337,661	
RPS Requirement (% of Total Retail Sales)	5%	5%	7%	7%	9%	9%	11%	11%	13%	13%	15%	
RPS Generation Requirement (1000 KWh per year)	1,393,215	1,414,113	2,009,455	2,039,597	2,661,674	2,701,599	3,351,484	3,401,756	4,080,561	4,141,769	4,850,649	
<b>Renewable Generation Mix (%)</b>	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Wind	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	
PV	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	
Biomass Cofiring	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	
Geothermal	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	
<b>Renewable Generation Capacity Factors</b>	Capacity Factor											
Wind	0.35											
PV	0.25											
Biomass Cofiring	1.00											
Geothermal	0.90											
<b>Additional parameters</b>												
Percent co-fire	5%											
Hours per FTE	2000											
Annual growth rate of retail sales	1.5%											

<b>Labor Totals, 2003-2013</b>				
Technology	Manufacturing Jobs (FTE)	Installation Jobs (FTE)	O&M Jobs (FTE)	Total jobs by Technology
Wind	2,476	530	751	3,757
PV	16,662	4,817	1,661	23,140
Biomass Co-firing*	n/a	n/a	89	89
Geothermal**	n/a	n/a	243	243
<b>Total by Job type</b>	<b>19,138</b>	<b>5,347</b>	<b>2,744</b>	<b>27,229</b>

\*Assumes silvicultural wood only, no other biomass fuels. Biomass co-firing does not include O&M of the coal-fired power plant, only the growth, harvesting, transport, and preparation of biomass fuels

\*\*Geothermal estimates include O&M labor only

<b>Capacity Totals, 2003-2013</b>		
Technology	Cumulative Installed Capacity (MW)	Cumulative Capacity (%)
Wind	791	50%
PV	664	42%
Biomass Co-firing*	55	4%
Geothermal**	62	4%
<b>Total</b>	<b>1,572</b>	<b>100%</b>

<b>Cost Offset, 2003-2013</b>				
<b>All Jobs (10 years)</b>	\$/FTE	Jobs	Value of jobs	\$/kWh
Unemployment	\$ 16,104	27,229	\$ 438,503,429	\$ 0.01368
Incubator	\$ 1,109	27,229	\$ 30,197,485	\$ 0.00094
<b>Installation and O&amp;M Jobs (10 years)</b>	\$/FTE	Jobs	Value of jobs	\$/kWh
Unemployment	\$ 16,104	8,092	\$ 130,311,537	\$ 0.00407
Incubator	\$ 1,109	8,092	\$ 8,973,888	\$ 0.00028