POTENTIAL OF GREEN JOBS IN SOUTH WEST USA 2012

Project Description

USA is rife with debate over the loss of jobs due to climate mitigation and adaptation policy. This project aims to calculate the number of jobs that solar PV industry can add to the USA market. The unemployment caused by closing of polluting industries can be countered by an effective transition policy that allows workers to get skills that make them successful in the growing green economy.

This model will first do a suitability assessment for solar PV in the six states of Arizona, California, Colorado, New Mexico, Nevada, and Utah. The choice of the area under analysis is driven by two reasons: firstly, there is good solar potential in these states, and secondly comprehensive data is available for these states. Second step is to calculate the number of potential jobs that can be created in the counties with the highest number of unemployment.

Methodology

The temperature data was classified as excellent, very good and good depending on the potential of harnessing solar energy through photovoltaic panels. The next step was to exclude all the critical habitat land, national parks, lakes, conservation areas, historical sites, Department of Defense sites and land management areas. The solar plants that are currently operational were also removed from the area by creating a buffer of 100 meters around them.

Additionally I calculated a 10 km distance from the transmission lines. The resultant map represented the areas in the 6 states where photovoltaic panels could be potentially installed.

The second analysis involved using census data on unemployment from the age group of 16-64 years for both males and females. I used absolute numbers for unemployment and projected the information on the map by county that forms the background of the main map.

Lastly, I calculated an approximation of the number of jobs that these areas could potentially create in a pivot table. Kammen, Kapadia, and Fripp (2004) approximates that a single MW creates 10.56 jobs. This includes construction, manufacturing, installation, operation & maintenance, and fuel processing jobs, and is the average employment over the life of the facility. This estimation is used as a higher bound. For the lower bound, all values were reduced by half, ie. single MW creates 5.28 jobs. Similarly, the assumption that 1 MW of energy produced by photovoltaic panels requires 6400 square meters of area was doubled.

Assumption 1:

An area of 6400 square meters has the potential to produce 1 MW of energy.

Calculation:
1MW = 1000 KW = 1000000 W
If 250 W modules are used
Then number of modules = 1000000W / 250 = 4000 modules
Generally a single 250 W module occupies 1.6 square meters of area,
Therefore, 1.6 square metres * 4000 = 6400 square meters

Assumption 2:

On an average, 10.56 jobs are created in the solar PV industry per MW of energy. (Kammen, Kapadia, and Fripp (2004))

Limitation 1:

Other than the assumptions previously mentioned, the calculation of area available for photovoltaic does not take into account the space required between different panels to prevent shadowing. Also, even after excluding critical areas, development on ground is dynamic and the area used in the calculation might not be actually available for development. This analysis does not include private structures as they can be expropriated by the government for public use, if necessary.

Limitation 2:

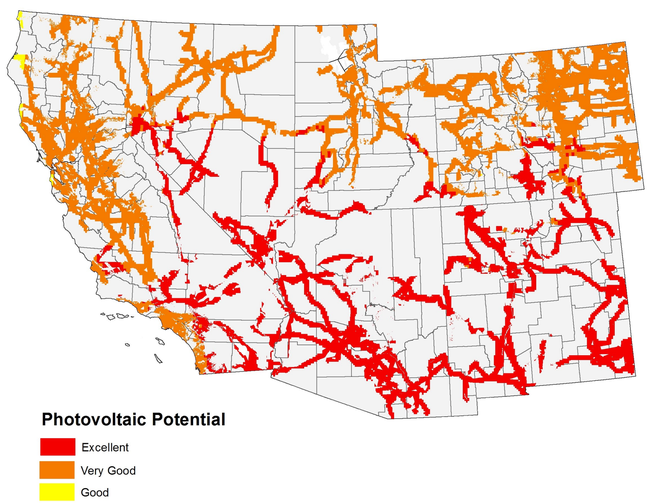
Most of the data used in the analysis is around the year 2012.

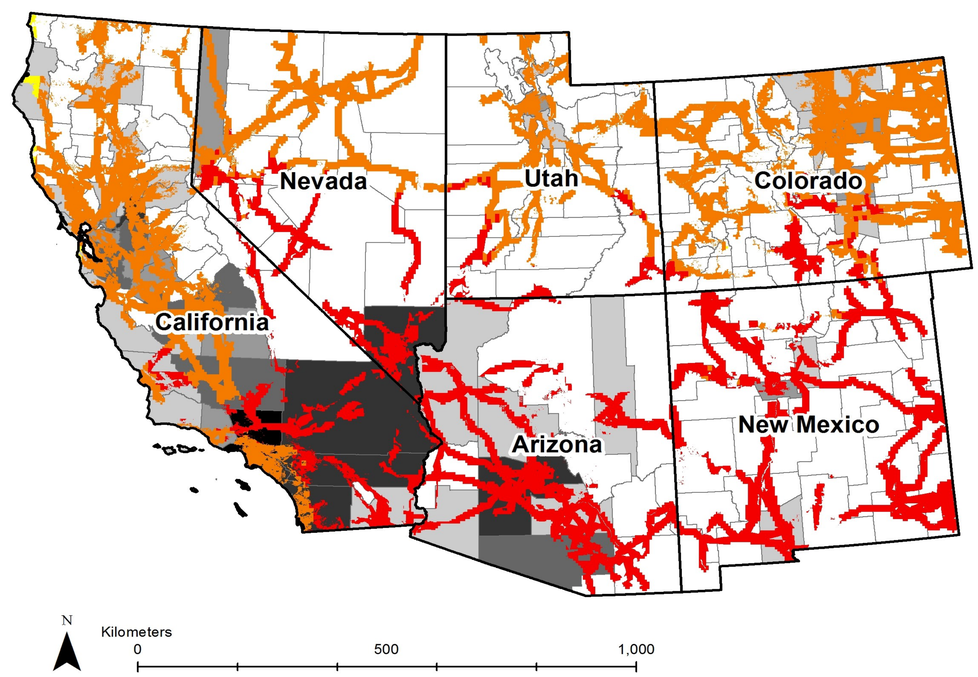
Limitation 3:

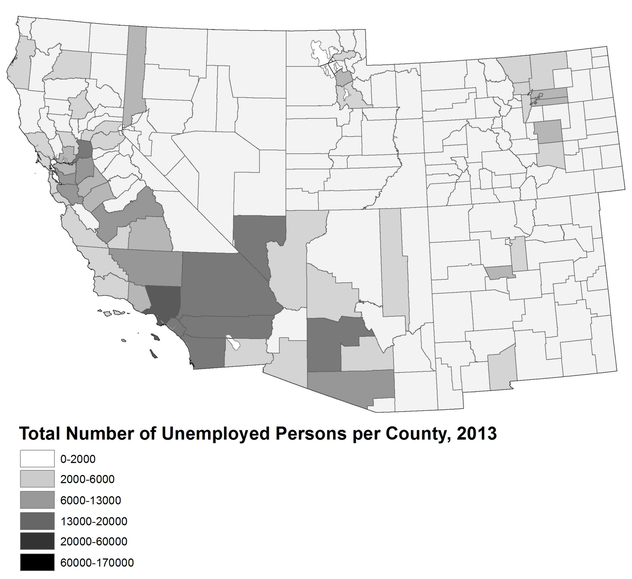
The potential jobs in the analysis is an estimate of part time/ full time/contractual and seasonal jobs in the industry. More importantly, its not telling of the education and experience that these jobs would demand.

Conclusion

There is high potential for creation of solar jobs in these 6 states in the USA. The two issues that require policy attention would be the cost and skill development for the unemployed population to successfully integrate them into the green economy.







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Data Sources: Solar Energy Development Programmatic EIS Information Centre 2012, Bureau of Land Management 2012, ESRI Online 2009, National Renewable Energy Laboratory 2014, U.S. Fish & Wildlife Service 1999, U.S. Census Bureau 2013

Projection: USA_Contiguous_Albers_Equal_Area_Conic_USGS_version

References: Daniel M. Kammen, Kamal Kapadia, and Matthias Fripp (2004) *Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?* RAEL Report, University of California, Berkeley.

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