



Solar Mountains



Abstract

There are currently many sites in West Virginia that would be suitable for solar farms.

The locations that we are particularly interested in are areas where mountaintop removal mining has taken place. These sights were exploited and abandoned and this has left open swatches of land with readily accessible roads that would be ideal locations for solar fields. Solar fields can provide energy for sale and local communities, as well as provide valuable new jobs to a state struggling to find an answer to its economic struggles. Therefore, this project examines the potential for revitalizing these mine sights for utility scale solar farms.

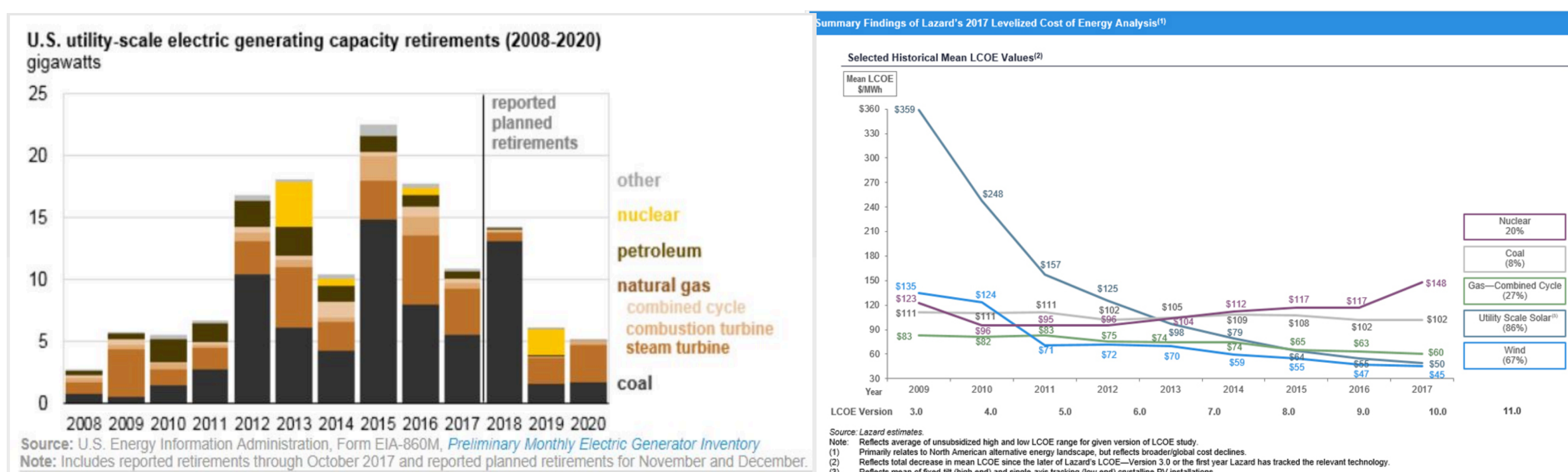
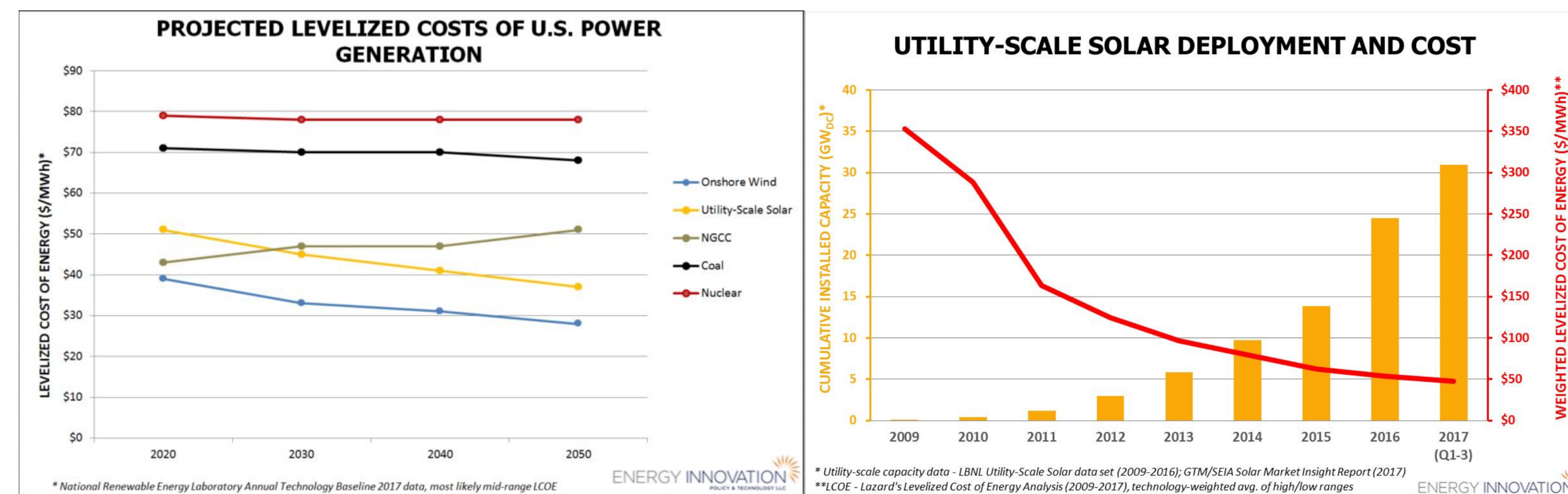
Introduction

West Virginia is no stranger to economic hardship. The state frequently is named one of the worst 5 state economies in the country, even when coal mines were at maximum operation. In light of this, former mountaintop coal mining sights can be reutilized to provide solar energy, jobs and growth to our state.

Solar energy is one of the fastest growing sources of energy in the world. As technologies become more efficient and available, they have become cheaper.

Discussion

- Potential land in West Virginia: 352,000 acres
- Acres for 1,000 homes: 32 acres
- Production potential of WV: 11,000,000 homes
- Land requirement for all WV residents: 58,240 acres (1.82 million)
 - Only 16.5% of potential land
- Wages for Solar PV installer in U.S. in 2017
 - Mean: \$43,010/year
 - Mean hourly wage: \$20.68
- Mean household income in WV in 2016 was \$43,385



Discussion Cont.

- Solar energy is the 2nd cheapest source of energy in America
 - Building and maintaining new utility scale solar plants is cheaper than operating already existing coal-fired plants
- Subsidized solar cost dropped 72% from 2009-2017
- Solar is trending to be priced below \$1 per watt at utility scale production
 - Utility scale is <2MW
- A 50 acre solar farm can produce the same megawatt (MW) production as the 4,000 acre 66MW Mountaineer Wind Energy Center in Preston/Tucker county
- 27 coal fired plants closed in 2017
 - 22 GW of power
 - larger number planned to shut down in 2018

Conclusion

As the coal industry continues to leave West Virginia, solar installation and maintenance can help to mitigate the loss of jobs and money for the state's economy and citizens. We can also begin to put back to use the land lost to strip mining and mountain top removal and help give West Virginia the push it needs into the future.

Selected References

- <http://appvoices.org/2017/06/15/kentucky-coal-mine-solar-farm/>
- <https://www.courier-journal.com/story/tech/science/environment/2017/04/18/coal-company-plans-huge-solar-farm-strip-mine/100597672/>
- <https://www.energymanagertoday.com/it-takes-2-8-acres-of-land-to-generate-1gwh-of-solar-energy-per-year-says-nrel-094185/>
- https://www.sourcewatch.org/index.php/The_footprint_of_coal
- <http://www.deptofnumbers.com/income/west-virginia/>
- <https://www.bls.gov/oes/current/oes472231.htm>

Group 39