

I'm Steve Heitmann. My wife and I live 10 miles from White Salmon. I designed and built a 20kW solar system, so we can live 100 percent off-grid for 8 months and 90% off-grid for 4 months during winter. I'm a research engineer with several decades' experience, and I've been a strong proponent and user of solar technology since 1974.

Although I strongly support solar clean energy generation, I do not support megasolar farms in the Pacific Northwest region. I also agree with the Klickitat County commissioner's statements. In addition, consistency with EFSEC's existing land use criteria in no way implies that those criteria are complete.

In fact, EFSEC needs to complete significantly more groundwork before it can consider certifying any large-scale clean energy project in the state. I base this conclusion on reading RCW 80.50. Until this groundwork is complete, we should go beyond Klickitat County's moratorium and get an injunction against all large-scale clean energy projects in the state.

Regional clean energy generation is soon-to-be urgently needed, as the Pacific Northwest population steadily increases, agricultural demand increases, and the need for electric vehicle (EV) battery charging is increasing rapidly--all this is increasing regional power demands, while potentially, in the foreseeable future, overloading the power grid. And hydroelectric clean-energy generation is already at capacity, forcing out of state power purchases.

Without more regional power generation, the cost of residential and commercial power will continue to increase. According to the January 2023 Klickitat P.U.D newsletter, *"Utilities are facing reduced supply and increased demand within the power market. This combined with increased load and cost of doing business reinforces the rate increase decision was prudent to ensure ongoing reliability & stability."*

Increasing regional power generation is important and somewhat urgent. Nonetheless, it's not so urgent that we need to risk sacrificing our best possible clean-energy future with hastily made decisions. And this is what we're risking by prematurely approving, let alone expediting, any large-scale energy project, including the Carriger Solar, LLC's project application.

Why? The big picture is that we are shifting to greater reliance on clean electric energy, electric cars, electric trucks, and electric airplanes. This is new territory: The electric grid architecture is over a century old, and the electric energy generation needed soon will far exceed the nation's (and grid's) existing capacity.

*"Many estimates suggest electricity demand could more than double by 2050 to reach net zero."*—Bill Gates

The planning decisions and the energy generation plants we build in the next few years based on today's groundwork will have consequences 50 years hence, possibly even longer. Let's now put in place the best possible planning for the best sustainable clean energy generation, for the long-term, and for sustained community quality of life.

What groundwork is needed?

### **EFSEC Needs a Certification Process Reflecting Unanimity of Purpose**

We need to start by improving EFSEC's certification process. We—meaning WA state, all counties, cities, native American communities, and energy companies—need to work together to establish *one* set of certification criteria for clean energy projects that is designed to accommodate all affected. That means EFSEC needs to accommodate *by law* requirements specified by each potentially affected jurisdiction.

RCW 80.50.020(6) <https://bit.ly/44vZkb7> could be modified to specify inclusivity. For example, RCW 80.50.020(6) could specify "'Certification' means a binding agreement between an applicant and *all affected jurisdictions* which shall embody compliance to the siting guidelines, in effect as of the date of certification, which have been adopted pursuant

to RCW 80.50.040 as now or hereafter amended as conditions to be met prior to or concurrent with the construction or operation of any energy facility. 'All affected jurisdictions' means the following: (6a) Washington state (6b) each affected county (6c) affected Native American lands (6d) each affected city or town (6e) any affected bordering state."

If a proposed project can't meet negotiated certification criteria, then it probably needs to be redesigned, relocated, or terminated.

As it is, we have a patchwork quilt of city and county ordinance's, concerned citizen's, including Native American's, driving loosely or incoherently defined requirements that EFSEC can consider. However, EFSEC is not mandated by law to meet those requirements and get approval by all affected jurisdictions to certify a project.

Without an inclusive certification process, we will face similar problems that are already happening in cities throughout California. Large construction companies are bypassing city or county ordinances by getting CA state approval based on laws these companies' lobbyists helped write. Just one example: <http://bit.ly/3XWshZY>

### **EFSEC Needs "Cradle to Grave" Requirements**

EFSEC includes preliminary and operating requirements. Additionally, EFSEC must establish stringent requirements for end-of-life recycling as a part of the certification process. Spent solar panels, batteries, and electronic components must be properly recycled and not end up in landfills, where soil and water can be contaminated. EFSEC must establish a costly consequence for any energy company that ignores these requirements at end-of-life for any energy system component.

We all know that technological innovation occurs at an ever-faster pace. Today's high-tech megasolar plant will be tomorrow's forgotten pile of obsolete junk. When it becomes obsolete and before it's forgotten, hundreds of acres of solar-farm junk need to be completely removed, and the land restored. Energy companies must be responsible for restoring the land or waterways when they decide to move on to the next more profitable energy technology.

### **EFSEC Needs to Require Safe Alternatives to Lithium Energy Storage**

The necessary groundwork includes evaluating battery technologies other than Lithium. Yes, there are several safer and just as effective battery technologies that are available on the market today (I own stock in them, so I won't list them here). They should all be evaluated, and EFSEC certification should require use of the safest and most recyclable battery technologies.

When EFSEC is required by state law to certify clean energy projects only when the negotiated requirements of all concerned are met, Washington State's EFSEC could serve as a model for all states.

### **Good Groundwork Includes Identifying Alternatives to Megasolar Farms**

Comprehensive due diligence requires that we evaluate all viable clean energy generation technologies before making decisions about Klickitat County's clean energy future. The "pro" and "con" discussion about megasolar farms is stuck in the past, as it's not concurrent with advances in new technologies. We need to widen the scope of discussion of clean energy generation to address good alternatives to massive solar farms.

Moreover, from a cost-effective and profitability perspective, the Pacific Northwest (PNW) region and Klickitat County is not an especially good location for utility-scale megasolar farms due to low solar irradiance levels during six months of the year. These monthly Solar Irradiance maps support this assertion (check 120degrees longitude, 46 degrees latitude). <https://bit.ly/41Lh1l4> . *Please note residential- and small-scale solar is cost-effective in the PNW.*

Yes, there are good alternatives to megasolar farms in the PNW. The "right tool for the job" also applies to methods of clean energy production. Solar arrays are a good choice for small-scale residential and business roof-top power

generation. But this method is inadequate for meeting a substantial portion of the future daily power needs of WA state.

According to the U.S. Energy Information Administration (EIA) <https://bit.ly/41CEkwM>, for year 2022, Washington state generated including 7.64% of its total power from land-based wind, 2.98% from coal-fired generators, and only 0.079% from solar PV panels. This total was less than needed. Consequently, 4.95GWh was imported from other states <https://bit.ly/41HyhaX> (tab: *Consumption by Source*)

The Carriger solar farm's projected generation is 160MW. To put this in perspective, at end of 2022, this would eliminate WA state's power deficit and eliminate only 37% of Washington state's coal-fired plants. It would soon fall behind meeting WA state's growing power demands.

**The first good alternative is offshore wind generators.** ONE average-size land-based wind generator produces 2 MegaWatts (MW) at peak output and requires 1.5 acres, almost all of which is available for crop or livestock production. This ONE wind generator is equivalent to about 2-3 acres covered with 6,200 325W solar PV panels at peak output. Unless it's an agrivoltaic solar farm, virtually none of the land can be used for livestock or crops, and it could disrupt ecosystems and block wildlife thoroughfares.

Ocean winds are even better for generating wind power because they are more constant and tend to be strongest during hours of peak power demand. In September 2022, development of offshore floating wind generation was incentivized by the federal government.

Washington State's offshore wind generation potential is 29.4 GigaWatts. Even if only 10% of the total potential is developed, that's 5 times more peak power generated than all three proposed Klickitat County megasolar farms combined! Moreover, one offshore wind generator can produce up to 18MW. That is, ten offshore wind generators would produce more power than the proposed Carriger solar farm.

**Other good alternatives.** Agrivoltaic farms enable many small solar farms combined to contribute more power than a single mega solar farm. They are more robust without one point of failure. Furthermore, agrivoltaic farms can use existing grid-tie infrastructure. They aren't limited to locations near high-power transmission lines. And they double for livestock or crop production. Please see <https://agrivoltaic.solar>

**Another** possibility is to install agrivoltaic farms on land already used for wind farms. Imagine a "ribbon" of solar panels between each wind-generator mast. Such an installation could produce an estimated 180MW or more (20MW more than the Carriger solar farm). Moreover, the land would remain usable for crop or livestock production.

**And there are other possibilities that go beyond wind and solar.** We need to look at green hydrogen-based fuel cells. And yes, we need to include the possibility of much safer Thorium (not uranium) based Molten Salt Reactors (MSRs). Lastly and definitely not least, we need to investigate developing a "smart grid" distributed local network architecture that enhances the existing grid system.

Let's make sure we have a complete understanding of the technology and alternatives. We need to ensure we put in place the right planning and approval processes for the long-term to meet our future clean energy needs. For people, for state and county, and for energy businesses long-term profitability, let's aspire to achieving a win-win-win sustainable clean energy future.