

ODOT Responses to Oregon City Email Being Circulated



The email currently being circulated from the Oregon City resident raises questions that merit thoughtful response. It is important to view both the concerns and the responses in context however, including the array's proposed location, size, existing utility infrastructure, and environmental laws and regulations which govern processes and behavior here in the US. While we have endeavored to respond to each item below, regrettably it is difficult to locate some of the cited sources to corroborate the statements made.

Q: I have some real concerns about ODOT's plans for the World's Largest Solar Highway Project to be located in the West Linn and Oregon City communities. The current world's largest solar highway is in Germany at 2.8 megawatts. This project is planned to be 3.0 megawatts in just the first phase. The second phase would double the world's largest project at 6.0 megawatts.

1. The City of West Linn has asked that ODOT consider locating the world's largest solar highway project on a hillside southwest of the former West Linn rest area. ODOT owns about 43 acres on the hillside that has been benched for stability. Although the site could theoretically hold up to 6 megawatts of solar, the only project being considered is one that would have between 13,600 and 17,000 panels depending on the panels selected to generate 3 million kilowatt hours of electricity annually. No other phases are now being considered. Any significant later expansion is unlikely given cost considerations and the engineering challenges of locating panels on a slope but any such expansion would go through its own public review process.

Q: Is the site they are looking to locate the solar project at the closed rest area on I-205 between the Highway 43 exit and 10th Street exit in West Linn?

2. The site is not at the old rest area but just west of the rest area at an old ODOT quarry site – used to provide rock to build I-205 – located above I-205 in West Linn. It is above the “bus barn” – the school bus storage area visible from Oregon City. It is currently being used to store sand and highway barrier and other ODOT maintenance equipment – also visible from across the river.

Q: The first phase of the project would place 13,600 to 17,000 solar panels on the site. Each solar panel is approximately 3 feet by 5 feet in size. In order to place these panels will they have to cut down 300 trees?

3. Large trees and solar panels do not exist well together, as shade greatly reduces the productivity and cost-effectiveness of the solar panels. A study has not been completed yet to determine the number of trees that would be removed to ensure the maximum efficiency of the solar arrays. In the meantime, based on preliminary reviews, it appears that 150 – 300 trees might need to be removed from the lower and upper benches of the site so the array would not be shaded.

The tree study is part of the scope of work for the geotechnical survey contract which is currently being drafted. The

physical survey of the land will identify the boundaries or corners where the fence will be, and trees inside the identified fence area and immediately in front of it will likely need to be removed. This work will be done in coordination with regulatory and permitting agencies, such as the City of West Linn, Oregon Division of State Lands, the U.S. Army Corps of Engineers and others.

From a climate change perspective, the benefit of the panels greatly exceeds the losses of trees. Early sense of scale studies have shown that the avoided carbon emissions reduced through the use of solar power has a greater positive impact to the environment than the amount of carbon sequestered by the trees.

Q: At this point ODOT is saying the panels will be located on the flat areas on the site, so they will be less visible. In the artist renderings the panels are mounted in many, many rows that are 3 panels high in a row. Three panels high would be about 15 feet high, not including the base. In phase 2 they will run out of flat areas and are going to study whether they can mount the panels on the hillside. Is this true?

4. This 3 MW project would look similar to the solar highway demonstration project in Tualatin at the intersection of I-5 and I-205. The solar arrays would be arranged in rows measuring 2,300 feet from end to end and would consist of 220-watt panels that are approximately 5 feet by 3 feet with three panels forming the sloped height of the array. The solar panels would be ground-mounted to the benched or flat areas of the West Linn site with the lower part of the system sitting 2.5 feet from the ground and the highest part (the top edge of the three stacked panels) of the system 13.25 feet from the ground. For scale, the concrete dividers currently stored on the site are stacked 9 feet tall.

There is no phase 2 contemplated at this time. See Response #1 for details.

Q: I understand the site is a stabilized slide zone. Will cutting down the trees cause erosion?

5. A stormwater system will be designed as part of the scope of work for the project. The design will use information generated from the geotechnical survey mentioned in Response #3 to ensure all design stormwater flows are accommodated. The soils on site are thin; most of the material was removed in order to stabilize the hillside. This is why the rain runs off the hill instead of seeping in. The geotechnical study will also ensure that the stability of the site will not be at risk if the solar installation is completed.

Q: There are articles on solar panels that say the life expectancy of a solar panel is about 20-25 years and there are many hazardous toxins found in the panels that will have to be recycled or they will pollute the earth. However, according to the article, no one is really stepping forward to recycle these panels. Is this the case?

6. The solar panels must be produced and recycled in an environmentally responsible manner. The solar panels used for the first solar highway project at the I-5/I-205 interchange used mono-crystalline modules manufactured by SolarWorld in Hillsboro. These solar panels are warranted for 25 years, but in practice are likely to perform well for much longer. SolarWorld panels made 27 years ago are still producing 87% of their original power, and the world's first mono-crystalline solar panels made by Bell Labs in 1953 are still working today, 56 years later.

SolarWorld formed its recycling division in 2001 and commits to recycling its panels at the end of their useful lives, using the materials as "seed" to grow new solar wafers, which make up the panels. Cells and modules made of recycled panels meet the same quality and performance criteria as modules from non-recycled materials. A recent move toward automation has streamlined recycling processes, making production of recycled products less energy-intensive than primary production.

All Oregon Solar Highway projects will require recycling from any solar panel supplier – if the company cannot commit to recycling the panels at the end of their useful life, they will not be considered. The solar panels installed in the Oregon Solar Highway projects may not contain hazardous materials.

Q: In the report, Sunshine or Gloom: How safe are solar panels?, I read of an underlying danger – silicon tetrachloride. Silicon tetrachloride is a hazardous material resulting from the manufacture of solar panels. If it is dumped onto fields, it makes the land unsuitable for growing crops. For each ton of polysilicon produced by the solar industry for its solar panels, four tons of silicon tetrachloride is generated. How is the United States addressing this?

7. The article is based on Silicon Valley Toxics Coalition's January 2009 white paper, Toward a Just and Sustainable Solar Energy Industry. That paper actually says, "Although it is easily recovered and reused as an

input for silane production, in places with little or no environmental regulation, silicon tetrachloride can constitute an extreme environmental hazard.” (Emphasis supplied.) The white paper cites an article in the Washington Post that reports environmental abuses in China which lacks needed recycling facilities, but says “Because of the environmental hazard, polysilicon companies in the developed world recycle the compound, putting it back into the production process.”

Q: I’ve read how being next to electromagnetic fields (electricity) increases the chance of Leukemia in children and the death of adults from Alzheimer’s disease. (from: BC Medical Journal-BC Center for Disease Control and MSNBC Wire Service-Reuters Health.) I am really concerned about how the collection of solar energy affects humans in a community area.

8. Electromagnetic radiation is all around us – it is not inherently harmful. It is in the sunlight that warms the earth and that will be converted by the solar installations into useful energy while producing few electromagnetic emissions of their own. According to solar resource experts, even in homes just 250 feet away, those emissions would be less than produced by a common home appliance such as a refrigerator or washing machine or technology like a computer or television that we live with every day.

Q: According to one article, even the Federal Government is putting off large scale solar projects on public lands until the environmental impacts can be determined.

9. The concerns of federal land management agencies over solar development are associated with the use of the large tracts of land in quantities required for utility-scale solar. Public lands were generally acquired for significant resource values other than solar resource development. That is not to say that solar resource development cannot be consistent with those resource values, but that care must be taken to ensure that objective is fulfilled. ODOT is committed to ensuring that objective is fulfilled on the public lands for which it is the steward. If it can do so while also powering the transportation system with sustainable energy resources, the public interest is well served.

Q: I do not believe it is possible to have no glare or reflection with a huge array of clear glass over a dark panel. We already put sunscreen on to protect us from harmful rays from the sun and I am afraid this will direct additional harmful rays towards us.

10. The potential for glare from solar panels has been carefully considered, with the conclusion that it is not an issue. Research reports no difference in driver behavior along an English roadway after solar panels were installed. Solar panels have been installed at airports, including Denver, Long Beach, Fresno Yosemite, San Francisco, and others where there had to be confidence glare would not be an issue of concern. That conclusion is understandable given that solar panels are designed to absorb sunlight to produce energy.

Q: This solar technology may be outdated soon and a smaller panel may be able to collect the same amount of solar power that these 5’ x 3’ panels can now collect. Maybe they will even take the toxins out of the panels in a few years.

11. The newer generation of solar panels are larger and produce more energy than the previous generation. That does not mean that the earlier panels do not perform well. The smaller panels at the I-5 and I-205 interchange have performed very well. Both Oregon and the nation have made the commitment to invest in the development of renewable energy resource technology. Technological advances will be achieved only if investment in the manufacturing base is sustained.

The solar panels installed in the Oregon Solar Highway projects may not contain hazardous materials.

Q: I checked the internet and found Germany is looking into putting solar panel plants in the Sahara Desert and they want to power all of Europe with the power. So even if a small amount of electricity is lost when transporting the electricity, it hasn’t required a major electrical project to be near a community. It is only a flimsy argument the salesperson for ODOT is using for placing the solar panels in a community, it is not a genuine problem. Bonneville Power in the Gorge and Wind Turbines in Eastern Oregon supply power all over the state and they don’t need to be located in a community. More power would be gathered by solar panels located in Central or Eastern Oregon in the first place, as the sun shines more there.

12. PGE supplies more electricity to ODOT than any other utility in the state, and PGE service territory is northwestern Oregon. Most of ODOT’s electricity load is in northwestern Oregon. Under Oregon law, a net

metered facility offsetting PGE electricity requirements must be located in PGE's service area, be on ODOT's own property, and be for ODOT's own use. The project being considered would meet all of those requirements. A project in Central or Eastern Oregon intended to supply energy to offset ODOT's needs in PGE's service area would not meet those statutory requirements. Having the project in PGE's service area also saves transmission and distribution losses. For the three solar highway projects being contemplated, those line loss savings are enough to supply the electricity needed by 27 all electric Oregon homes over the life of the project.

Q: What is the energy conversion plant or process to convert the solar energy to usable energy before it is put into the transmission lines, and what does it look like?

13. The "energy conversion plant" is an inverter, which turns the direct current (DC) electricity produced by the solar panels into alternating current (AC) for that can be used on the transportation system. The inverter doesn't show up on artist renderings because it won't be seen – it will be located behind the panels just as it is on the demonstration project site at the I-5 and I-205 interchange. The 100 kW inverter at the demonstration project is approximately 62" wide, 92" tall, and 35" deep, and is located behind the panels and therefore unseen by motorists passing by on I-205 or just glimpsed by motorists on I-5. Larger inverters like the 260 kW model are nearly the same height at 94", but a bit wider at 99" and seven inches deeper at 42". As with the inverter at the demonstration project site, even the larger inverters will be tucked behind the solar arrays.

The inverter makes a "buzz" which is not noticeable unless you are standing close to it. Further away or off the project site, it could not be heard over the traffic noise from the highway.

PGE has two feeder lines on site which will be accessed to put the power on the grid; no new power lines will be needed. The ease of interconnection along with the southern orientation makes this a promising solar site.

Q: I heard that the power generated by the array does not go to ODOT or to light highways. The power goes to PGE, their partner in the project. ODOT doesn't even get credit for the power. ODOT cannot buy land to build this project, because it isn't for transportation.

14. Every kilowatt hour produced by the Oregon Solar Highway projects will be credited to the ODOT to power the transportation system. That is a statutory and contractual requirement. The electricity produced by the solar project is metered by the utility. The solar energy production at the demonstration project can be seen virtually real time at www.oregonsolarhighway.com, as will future solar projects.

Oregon's Governor Kulongoski has directed all State agencies to secure their electricity from renewable resources; further, policies and strategies adopted in the Oregon Transportation Plan support this renewable energy project. Policy 4.2 – Energy Supply states that it is the policy of the state of Oregon to support efforts to move to a diversified and cleaner energy supply, promote fuel efficiencies and prepare for possible fuel shortages. Strategy 4.2.1 directs ODOT to support efforts to move toward a diversified and cleaner energy supply. Further goals stated in The Oregon Transportation Plan direct ODOT to develop sustainable, secure energy resources.

Due to constitutional limitations on the State Highway Fund, property purchased with State Highway Fund dollars can only be used for transportation purposes. Due to those same Constitutional restrictions, ODOT is unable to purchase "green energy" from utilities at higher-than-grid rates. Oregon's Department of Justice has determined that generating the electricity needed for operating and maintaining the state transportation system is a transportation use. Through innovative and responsible public-private partnerships like the one between ODOT and PGE for the demonstration project, ODOT is able to secure green energy at grid rates.

For the demonstration project, solar energy produced by the array feeds into the grid during the day. At night, the meter essentially runs backward as energy flows back from the grid to light the interchange. ODOT, through a Solar Power Purchase Agreement with PGE, buys the energy produced by the array at the same rate the agency pays for regular energy from the grid. This is essentially the same model contemplated for future solar highway projects, except that ODOT will receive a site license fee for use of the land.

For the proposed City of West Linn project, each kilowatt hour produced by the solar array would be credited to ODOT offsetting electricity ODOT would have needed from PGE. This is called net metering. PGE supplies more electricity to ODOT than any other utility in the state. Under Oregon law, a net metered facility offsetting PGE electricity requirements must be located in PGE's service area, be on ODOT's own property, and be for ODOT's own use. The project being considered would meet all of those requirements.

Q: This solar project is a 20 million dollar project. I would like to know how long it will take to pay off the project with the electricity it generates?

15. While the cost of solar is coming down, it is still too expensive for ODOT to buy its own panels. Tax credits, accelerated depreciation and utility incentives are necessary to finance our solar installations. But ODOT, as a

ODOT Responses to Oregon City Email Being Circulated

Published on City of West Linn Oregon Official Website (<http://westlinnoregon.gov>)

governmental entity, doesn't have a tax liability. So in order to take advantage of the tax credits and accelerated depreciation, ODOT will enter into a public-private partnership with a third party power provider –with the demonstration project that was PGE. The third party finances, owns, operates and maintains the solar installation and derives all the tax benefits. While the specifics of the business model can vary, they all include using:

- the 50% state Business Energy Tax Credit or BETC,
- the 30% federal investment tax credit,
- accelerated depreciation, and
- utility incentives available through the Energy Trust of Oregon to customers of PGE and Pacific Power (about 20%).

This model makes it possible for a 3rd party power provider to sell energy from the installation that they own, back to a solar "host" which will be ODOT at a cost no more than that paid for electricity from the grid. Through a net metering agreement, ODOT pays for electricity produced but makes no capital investment or investment in operations or maintenance. If the land is needed for some other transportation use, ODOT has "call back" rights

If ODOT were to purchase the array, own, maintain and operate it without the option of tax credits and accelerated depreciation, it would take over 100 years to pay it off using savings from the energy generated and assuming current energy rates and regulatory structure. Under the third-party financing arrangement, ODOT receives green power that would usually cost 8 to 10% more at no greater cost than it would otherwise pay. ODOT then begins receiving net benefit the day the solar installation begins generating power.

Source URL (retrieved on 2012-05-10 23:36):

<http://westlinnoregon.gov/communications/odot-responses-oregon-city-email-being-circulated>