

Oxley Solar Works: SSD-10346 268ha development footprint

IPCN request

Save Our Surroundings (SOS) provides our comments on the Commission's request for further information from the Oxley Solar Works Proponent, in particular, issues 3, 4, 5, and 7.

We note that the Developer's responses totalled 228 pages. Even our rapid reading of the material raises more questions than answers. This is typical of all the "consultation", EIS and DPE documents that we in the country regions are faced with dozens of times a year. Documents of 1000 pages 2 years ago, then 3000 pages last year and recently 8000 pages are now normal. What Australian citizen, let alone farmers and supporting townspeople, can make time to attend "drop-in sessions", read, understand, analyse, write a submission, read the developer's response and make further comments, which the DPE appears to ignore, and still find time to produce the food for Australians and the rest of the world.

Despite highlighting the inconsistencies, omissions, non-factual claims, unsubstantiated claims, partial answers, exaggerations, use of weasel words, etc. of developers, the communities and Councils are largely ignored by the authorities. Developers ignore "difficult" questions from submitters and the DPE does not insist that the developer answer them, as they are required to do.

Just one example was a recent stand alone proposal for the Coleambally BESS, which SOS exposed as making multiple flawed claims. The Proponent acknowledged that the output "was wrongly calculated", which reduced the first year's output of the BESS from 380,000 MWhpa by over 60% to 146,000 MWhpa. Consider the impact that difference has on the AEMO's modelling and management of the NEM. Despite the substantial reduction in output and hence revenue for the same design and \$184 million capital cost the project was approved. How can such "errors" continued to be tolerated?

SOS trust that the Commission will be very objective in assessing the questionable claims made by the Proponent for Oxley Solar. We believe our comments highlight the flaws in the responses to the Commission's issues that we address below.

Issue 3: The yearly quantity of water required over the life of the project for maintenance of the proposed vegetation screenings, particularly during drought conditions, noting the need for fast growing, drought resistant plantings that are endemic to the area.

SOS comments:

The Beryl Solar Works, located within the CWO REZ, 5 kms from Gulgong, was commissioned in June 2019. These photos of the Beryl solar works, show how the Oxley Solar "screening" is likely to look after 4.5 years, if it were to proceed.

The original owner of Beryl Solar committed to the Planning Assessment Commission requirement that mature vegetation screening be at least 3 metres tall by 7/8/21. This did not occur (see photos below). DPIE was advised but said they don't monitor whether the conditions imposed are met or not, it is up to the local community to complain. Beryl solar is now on its third owner in 4 years.



Photo by SOS July 2019: Beryl solar "screening" plantings



Photo by SOS November 2023: Beryl solar "screening" plantings after 4.5 years



SOS photo 1/11/2020: weed growth only



SOS photo: 17/11/2023 plants are dying

In addition, a local Gulgong resident planted 26 well established trees on their acreage property in December 2021, during a period of nearly three years of above average rainfall (February 2020 - September 2022). Thousands of litres of watering was required since planting, but especially since September 2022 because of below average rainfall to date. (75% of NSW is now declared drought affected or in drought).

Therefore, we express concern that water usage for the proposed Oxley Solar is inadequate. Also, the time taken for seedlings or small immature plants to grow to become sufficiently established let alone form a screen is, from our experience, much greater than three months and will take many years to form a reasonable screen.

Recommendations: We request that the IPCN place the following conditions on the project (not the developer who is unlikely to be an owner in the future):

1. That 75 litre bagged advanced plants are used for vegetative screenings that are fast growing, drought resistant and are endemic to the area.
2. A suitable water reticulation system is installed to supply water-efficient delivery of water to the screening plants.
3. The water used for the screening plants to be not taken from sources normally available to local residents and farmers.

Issue 4: The Commission heard from speakers at the public meeting who stated that solar panels, when damaged or degraded, have the potential to leach heavy metals and contaminate agricultural land, water sources and aquatic habitat. The Commission notes the study you have cited on page 69 of the submissions report and the amended PHA dated September 2022. Can you provide further information on any contamination risks from damaged or degraded solar panels including what measures are proposed to monitor and manage any identified risks?

SOS Comments:

If the response of the Proponent is to be believed then all e-waste legislation across the globe must be wrong and therefore should be repealed. That would include e-waste classifications for mobile phones, computers, televisions, etc. as well as all the different types of PV solar panels, as they all contain similar toxic chemicals.

The European Union and numerous other jurisdictions have declared PV solar panels as e-waste because they are considered dangerous. Statements like these from the Victorian EPA, apparently based on convincing scientific evidence, are invalid according to the Proponent.

"It is estimated that more than 100,000 tonnes of solar panels will enter Australia's waste stream by 2035. This has the potential to create a hazardous waste management issue, as materials contained within solar panels can leach into soil and groundwater, causing environmental contamination and safety concerns if managed poorly. Keeping these materials out of landfill prevents environmental and human health problems, and rescues valuable resources for reuse. Compounding the issue is a lack of dedicated processing facilities in Australia that can recover valuable materials contained in PV products." [ref:

www.sustainability.vic.gov.au "The growing issue of PV system waste"]

However, the Proponent have admitted that PV solar panels also leach chemicals while in situ, based on their own statements, as follows:

"A US study conducted in 2017 on a solar farm constructed in 2012 concluded that there were some increased level of selenium, strontium, lithium, nickel, and barium levels in soils closer to PV panels, but stated no increases in lead or cadmium."

"Studies from the International Energy Agency and the UN have noted that risk to human health and water contamination from heavy metals leaching out of solar panels is below the USA's screening levels and within World Health Organization guidelines (ABC, 2022)."

This study concluded that the leaching of lead from PV solar panels is above safe-limits.
<https://www.sciencedirect.com/science/article/abs/pii/S0048969721017137> (copy & paste).

There are many types of PV solar panels. Each may have different chemical mix in them. [[Comprehensive Guide to Solar Panel Types | Aurora Solar](#)] Panels, after decommissioning, that contained zinc were found to have contaminated the peanut growing farm. What was a "harmless" chemical turned out to have detrimental impacts on at least one type of farming. Details of the different types of solar panels can be found in the following link. 'Materials for Photovoltaics'.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6412461/> (copy and paste into browser)

The site is 1021ha and the development footprint of the 215MW Oxley Solar Works is stated as 268 hectares, which will accommodate 385,280 solar panels or an equivalent to 32,576 rooftop systems of 6.6kw each (215,000kw/6.6kw). Thus, the concentration of hundreds of thousands of PV solar panels over 2.68 km² of agricultural land for up to 25 years poses short-term and long-term contamination risks of yet unknown proportions. The area involved of even of the relatively small Oxley Solar Works magnifies the risks of large-scale damage and site contamination.

Nearby residents have a right to be concerned about the potential for toxic contamination from PV solar panels and industrial batteries. People thought, for example, that asbestos, DDT, fluorocarbons, and smoking were good ideas at one time. The precautionary principle, intergenerational equity, social impacts, environmental harm, sustainability and public interest principles should apply.

Taking the Beryl Works as an example, a grass fire at the works reportedly damaged 18 hectares of PV solar panels in April 2023. Despite requests to the DPE as to what happened with the damaged Cadmium-Telluride (thin-film) panels and if soil and water testing was done we are still to find out.

Examples of wind, hail and fire damage are:



Despite SOS's requests to the DPE that soil and water testing for chemicals contained in PV solar panels be done before installation (base-line) and routinely (annually) and after an incident (damage e.g. hail or fire) no such conditions have apparently been applied to any proposal to date.

Recommendations: We request that the IPCN place the following conditions on the project (not the developer who is unlikely to be an owner in the future):

1. That independent statistically significant soil testing be done across the whole of the development footprint for all the chemicals contained within the chosen and to be installed PV solar panels. The results will form the base-line against which future testing will be evaluated.
2. That once commissioned, independent statistically significant soil testing be done annually across the whole of the development footprint for all the chemicals contained within the installed PV solar panels.
3. Following a significant incident of panel damage involving (say) 5% or more of the PV solar panels then an independent statistically significant soil testing be done of the whole of that area.
4. That the soil testing only be carried out by a Department of Planning and Environment NSW or EPA approved soil-testing and analytic expert.
5. That the initial and all subsequent soil-testing results be lodged within two months of testing and the results made available to the local Council(s), the DPE and general public via the project owner's website.

Issue 5: Noting the concerns raised in the public meeting regarding damage to the solar arrays after a storm or hail event, what protocols would be in place to monitor the condition of the solar panels and, if needed, replace damaged panels, including the timing? In addition, how would you manage the disposal of any damaged solar panels?

The Proponent of Oxley Solar Works have stated:

"There are currently at least 11 companies who recycle solar panels and products in Australia; Reclaim, PV (interstate), PV Industries (NSW), Solar Professional (NSW), SolaCycle (NSW), CMA Ecocycle(NSW), Ecoactiv (NSW), Elecsome (interstate), Solar Recovery Corporation (interstate), ScipherTechnologies (interstate), Lotus Energy (interstate), WA Recycling (interstate). Panel repurposing (such as using sub optimum output panels for other projects) and panel recycling industries are expected to grow as more solar projects are approved. The fast-paced rate of technological change with regard to PV and battery technology is likely to trend toward longer lived infrastructure with increased recyclable content. The Clean Energy Council of Australia has noted the following national solar PV recycling research projects/funding taking place:

1. The NSW Government has committed \$10 million to boost solar panel recycling.
2. Researchers at Deakin University working to develop a solar panel recycling solution to recycle silicon.
3. \$15.14 million awarded through the Australian Renewable Energy Agency (ARENA) to support research teams at six Australian universities including investigating new solutions,

including upfront solar PV panel designs and end of life processing, that increase the cost effectiveness of sustainable end-of-life management of solar PV panels. As the solar industry becomes established in NSW, further opportunities are considered likely to be identified regarding local and regional reuse and recycle options."

SOS Comments:

The preceding statements by the Proponent raise a few further related issues concerning the disposal of end-of-life PV solar panels.

The first commercial PV solar panels were invented in the 1950s by Bell Laboratories. Western Europe and the USA for instance, have been decommissioning solar works for several years (USA average life 21 years as at 2021). Yet economic recycling of solar panels still eludes them. If economic recycling of panels existed overseas then successful companies would set up recycling plants in Australia, especially as government assistance is so generous.

Why are Australian governments funding start-ups and research into recycling for such a long-lived issue? This long-running issue is a global problem but has been imported into Australia.

"Panel repurposing (such as using sub optimum output panels for other projects) and panel recycling industries are expected to grow as more solar projects are approved." We agree that more and more waste will be left for current and future generations to deal with on a massive scale and cost. "Panel repurposing" actually includes exporting the damaged or uneconomic solar panels to third world countries for minor home use or just as likely to extract what the poor people can before dumping the useless panels in their landfill.

"The fast-paced rate of technological change with regard to PV and battery technology is likely to trend toward longer lived infrastructure with increased recyclable content." It has taken nearly 70 years to go from an 8% efficiency to a commercial low 20s% today. Hardly fast paced change. One change has been in the silver content of panels. A decade or so ago the silver content was very high so extracting it from solar panels was the main recycling effort.

However, modern panels have very much less silver in them, so making extraction less economic. According to energysage.com undamaged second-hand PV solar panels are worth between US\$0.10 to \$0.75 per watt. [Ref: www.energysage.com Used solar panels: Are They a Good Idea?]. Therefore, a used 560W Oxley Solar Panel today would be worth about US\$55.80 to US\$418.50. A damaged one probably zero. A US study found that recycling a solar panel cost US\$10 per watt but only yielded US\$2 in recovery value. Hence panels are not even close to being economically recyclable.

The claim that "There are currently at least 11 companies who recycle solar panels and products in Australia" is misleading. A typical tactic of developers. Reclaim PV Recycling Pty Ltd was the first and most quoted large-scale recycling plant in Australia, which was established in mid 2019 after years of research and logistical modelling. It became insolvent in 2022 and as at September 2023 was being wound up. Its facility had stock-piled 50,000 to 100,000 panels, including cadmium telluride panels, which can only be processed in one or two facilities overseas.

All the others named "recyclers" either only remove the aluminium metal frames and the regulators or recycle other materials not related to solar panels. The balance of the panels are stockpiled or possibly sent to landfill. None are actually have started processing solar panels.

[ref: [pv magazine issue 06/23 https://www.pv-magazine-australia.com/2023/06/17/weekend-read-solar-recyclings-glass-ceiling-and-other-problems/](https://www.pv-magazine-australia.com/2023/06/17/weekend-read-solar-recyclings-glass-ceiling-and-other-problems/)]

The Oxley Solar Works will have around 8,476,160kg (8,476 tonnes) of solar panels to dispose of at decommissioning plus many tonnes of panel replacements during the operational life-time. But no solution yet exists for environmentally friendly way of disposing of them. Are we, our children and our grandchildren and even beyond have to deal with this burden. Will they ask why did our generation know of this long-standing problem yet just pass it onto us? Should not the precautionary, intergenerational equity, social impacts, environmental harm and public interest principles be applied?

This project contributes to the solar panel waste problem as well as the lithium battery waste problem and therefore must be held responsible for the further imposition it will place on our society and environment should the project proceed. After years of talk and research there are no adequate solutions from the industry for these rapidly growing waste issues . [[National approach to manage solar panel, inverter and battery life cycles | Sustainability Victoria](#)]

The Proponent should not have misled the authorities and the IPCN on this issue.

Recommendations: We request that the IPCN place the following conditions on the project (not the developer who is unlikely to be an owner in the future):

1. That a contribution of (say) 2% of the capital value of the project to fund the research into the safe and economic recycling of solar panels, batteries and inverters.
2. That an onsite covered and enclosed storage facility be established that will safely store damaged and end-of-life PV solar panels, inverters and BESS batteries until they can be fully recycled and disposed of economically and safely.
3. That a contribution of (say)\$5 per solar panel be paid into a fund for the establishment of safe off-site storage facilities.
4. That no solar panels, inverters or batteries or parts thereof be disposed of in landfill either within NSW or elsewhere.

Issue 7: Noting the potential for grass fires in the area, what measures would be in place to manage this risk? p13

SOS Comments:

The Proponent has stated the usual response to the management of fire risks. The proposed measures, such as a 20,000 litre water tank, 10 metre APZ, vegetation management, and bush fire management plans, will not eliminate the INCREASED risks involved.

Country regional inhabitants fear grass and bush fires above all other dangers they face. They are frequent, occur anytime of year and can quickly become devastating. The proposed standard response to fire mitigation fails to address any of the following:

- the Oxley Solar Works will INCREASE the risk of fires starting on the site and spreading from within or from outside the site. The INCREASED risk remains with the proposed mitigation proposals.

SOS submission on IPCN request

- Mitigation of chemically laden toxic smoke released from burning solar panels, lithium batteries, inverters, electrical wiring and other components has not been addressed at all.
- Rural Fire Service personnel are volunteers who have jobs or run farms and businesses. Volunteer numbers have been falling just when the wind, solar, transmission lines and BESS projects are increasing across rural and bushland areas.
- Many RFS fire-fighters have died whilst fighting grass and bush fires, including at least two in 2023 so far. It is a very high risk service they provide, not only to their own communities but across all regional communities and even overseas. The risk to them is INCREASED when they have to contain a fire occurring within a solar works or BESS. Toxic smoke INCREASES the risk over and well above the ash from a vegetation fire.
- The RFS, FRNSW and HAZMAT services will not enter a burning industrial solar works site or BESS due to electrocution risks, entrapment risks, explosion risks and chemically laden smoke risks. They will try to contain the perimeter but the sheer size of the fully high-fenced site makes this much more difficult. In this case size matters!
- It takes considerable time for each RFS team to assemble when a fire emergency occurs as many of them will be located well away from their base. The distances to be travelled from towns, farms, businesses are measured in tens of kilometres. An out of control grass fire can spread very quickly under benign conditions let alone under adverse conditions at any time of the year.
- If a BESS catches fire then RFS and FRNSW services have to tie up crews for days to contain the perimeter while the chemical reaction battery fire burns itself out. For the two BESS fires in Australia so far this took four days each. This EXTRA utilisation of fire-fighting resources puts other parts of the region at additional risk, especially when volunteer numbers are falling and funding is scarce.
- Special fire-fighting protection gear, such as additional breathing gear, is required to be near burning batteries and solar panels. Extra cost to the RFS and also space on fire trucks is already limited, so not all RFS volunteers will have access to such additional protective gear.
- RFS personnel are prohibited from publically speaking about how they respond to industrial solar, wind and BESS fires. The FSNSW was threatened to be sued by the owner/management of a recent solar works fire if they did not remove the photos from social media that they took of the fire. One of the FSNSW crew at the fire was also order to take down his personal photos of the fire, even though they were shot from outside of the burning site.
- While a different Council, the MWRC requires a land owner of 5 or more hectares to install a 20,000L water tank fitted with a 65mm storz fitting or reserve 20,000L of a larger tank for fire-fighting purposes. By the end of 2019, after three years of drought, virtually all water tanks and dams were dry. In late 2023 75% of NSW is already drought affected and regional people are once again trucking in water to their properties for domestic use and for their livestock. "The Development footprint will house a 20,000-litre water supply (tank) fitted with a 65mm storz fitting shall be located adjoining the internal property access road within the required APZ." is clearly inadequate. Hundreds of thousands of litres of water were used just on the two BESS battery fires. Not to extinguish but to keep the other units cool.

- Three out of control grass/bush fires near Gulgong in just October 2023 reached Emergency Level. They took days to control. Strong daytime winds blew burning embers hundreds of metres ahead of the fire front, causing additional fires. Likewise, a fire that started last year in a field across the road from a solar works and in benign conditions jumped the road and was extinguished just as it reached the solar works boundary. This was despite 15 emergency vehicles being present at the time and three water-bombing helicopters being used. This is the reality of our regional fires. "An APZ of minimum 10m would be maintained between all vegetation and solar farm infrastructure within the Development footprint." is meaningless when faced with the reality of an out of control grass fire.

Some examples of recent grass fires in a designated Renewable Energy Zone:

The Leadville-Dunedoo fire (Sir Ivan bushfire) of February 2017

[NSW coroner to inquire into 2017 Upper Hunter and Central West bushfire - ABC News](#)

55,000 hectares (550km²) of land burnt, 35 homes destroyed, 6,000 livestock killed and numerous injuries, farmland and wildlife habitat destroyed, untold wildlife killed and millions of dollars in damage done. All this in about 24 hours.



February 2017 Central West NSW Leadville-Dunedoo fire front



Why we hate grass fires

Beryl fire #1 July 2022

Essential Energy reported that 144 properties in the vicinity of Beryl Solar Works had lost power. An equipment fire at or near the solar works was reported. Most of the affected properties had no grid electricity for most of Sunday and over twenty properties still had no power well into Monday. The nature and cause of the equipment fire and power outage have not been publicly reported.

Beryl Fire #2 August 2022

[Water-bombers sent to out-of-control fire near Gulgong, as wet ground hampers RFS efforts - ABC News](#)

A grass fire that started about midday across the road from Beryl Solar Works jumped across Beryl Road and into grassland adjacent to the Beryl Solar Works. A major fire emergency was declared with over a dozen fire-fighting and police units dispatched within a 30 km radius or more of Beryl. In addition, three water-bombing helicopters were called in and used to save buildings and stop the fires entering the solar works, as vehicles could not get close to the fires. The fires burnt for nearly four hours before being brought under control, which was notified at 3:41pm



Fire jumped road from left to right



Fire reached solar works fence



Multiple RFS units fight the fire

Beryl fire #3 September 2022

Grass fire on the site at Beryl of yet another proposed solar works within sight of Gulgong township.



Grass fire starts about 12:20pm



Part of the aftermath

Beryl fire #4 April 2023

[Gulgong, NSW: Fire at Beryl Solar Farm | Sky News Australia](#)

On Monday 24 April 2023 at about 12:30pm a grass fire broke out. This was the worse of the recent fires that has occurred in or near the Beryl Solar Works, resulting in 18ha of damaged area under solar panels and a reported damage cost of \$7m. It burnt for about 4 hours. The several RFS, FRNSW and HAZMAT teams just protected the perimeter as they will not enter a burning solar works. A wind reversal extinguished the fire. Weather conditions were benign at the time. The cause of the fire was said to be an electrical cable fault under a solar array.



Smoke blankets nearby properties



Grass fire burns under the solar panels

Three emergency level fires between Gulgong and Mudgee in October 2023

Multiple fires around Gulgong, Ulan, Cope, Cooks Gap investigated by police, RFS amid fears they were deliberately lit.

[NSW fires around Gulgong, Ulan, Cope, Cooks Gap investigated by police, RFS amid fears they were deliberately lit - ABC News](#)

Home Rule and St Fillans properties at risk. More than 180 firefighters, over 50 fire trucks, two helicopters and a large RFS air tanker were used over several days.

[Authorities downgrade bushfire emergency warning in NSW's Central West - ABC News](#)





Some of the aftermath of the October 2023 fires along Henry Lawson Drive

The messages are is clear



Grass fires kill



Firefighters are "under funded" "under resourced" "under valued"

Conclusion

The proliferation of solar and wind works, including associated BESS, inverters, sub-stations and other infrastructure, as well as new high voltage transmission lines exposes landowners and towns people to significantly increased risks over and above the level of risks they already face. Concentrating such works in such a small area so close to towns invites a disaster at some point. Not if, but when! The precautionary principle must be applied.

Existing fire risk regulations and fire risk mitigation proposals are totally inadequate for solar and wind electricity generating works and BESS works and must be substantially improved before any more projects are approved so close to rural towns. SOS suggests for industrial solar, wind and storage projects that:

- No works be permitted within 15kms of any town
- Automatic sprinkler systems must be installed around the site perimeter
- Several onsite dams full of water must be maintained onsite for water-bombing craft use
- Several 50,000 litre water tanks must be located around the outside perimeter of the site

SOS submission on IPCN request

- Works owners must contribute financially to the local RFS and FSNSW units annually to help fund the specialised equipment and training required and for research into how to safely fight battery fires.

Regards

Save Our Surroundings (SOS)



Save Our Surroundings (SOS) is part of network of like-minded groups of concerned & impacted citizens in rural Australia directly affected by the proliferation of industrial scale weather-dependent “unreliables” & their negative impacts upon local & global environments & communities. Independently run groups like SOS span multiple States. We share & distribute information, research & experiences with each other & other parties.