The Team Leader Energy Assessments Energy Assessments 30 January 2023
Development Assessment
Department of Planning and Environment
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Maryvale Solar MOD 2 - Capacity increase | Planning Portal - Department of Planning and Environment (nsw.gov.au)
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Dear Contact Planner, Elisha Dunn
SOS Objects to SSD-8777 Maryvale Solar Works Mod 2

SOS strongly objects to this industrial project as a simple analysis shows it is not "fit for purpose". It will not impact climate change and will not result in lowering consumers' total electricity costs. Our review of the EIS and modification reports has raised many specific questions. The DPE must require the Proponent to properly answer each specific question and not generalise by amalgamating topics or providing general responses rather than complete and supported answers.

Project summary by SOS:

- **Changes in ownership:** History of multiple owners and work has not commenced in over three years!
- **Information:** Confusing, omissions, inconsistent! e.g. 230MWdc is vastly greater than 230MWac, but the latter is the normal value stated, except for this proposal.
- **Capacity/Capacity Factor:** inconsistent statement of capacities DC vs AC is misleading; capacity factor obscured!
- **BESS Issues:** Battery Energy Storage System (BESS) of 230MW capacity and 375MWh of output; lots of issues for community, RFS, slavery & future generations!
- **Contamination Ignored:** 450,000 panels contain toxic chemicals!
- **Construction Jobs:** 400 construction jobs during 12 months construction period; where will the workers come from!
- **Operations Jobs:** 4 operational jobs is a poor return for 25 - 30 years of further land disfigurement
- **Project life:** Project operational in 2025 with a claimed a 30 year operating life but batteries have very much shorter life before total replacement.
- **Project value:** Project value about $188m, but what is the Australian content!
- **Sourcing:** Component sourcing not disclosed, but will be imported; energy security at risk;
- **Subsidies:** Value of subsidies not stated, but are substantial!
- **Supply electricity to 82,000 homes:** Claims it will generate enough electricity for 82,000 NSW homes, but for how many hours a day.
- **Sustainable, clean, reliable and low-cost renewable energy:** Claims project will deliver sustainable, clean, reliable and low-cost renewable energy; unrealistic!
- **Embedded CO2e emissions:** Claims it will reduce CO2e emissions by 615,000 tonnes a year but will this offset the project's embedded CO2e emissions, how much was excluded
- **Decommissioning, etc:** decommissioning, rehabilitation and waste disposal will be enormous, but no upfront funds to be set aside!

Based just on the project summary above the concerns of each point are:

- **Changes in ownership:** Why has ownership changed so often already without any work even started? How many more ownership changes will occur over the project's life? How will all

the commitments made now be met and policed in the future and with each new owner? Why do so many industrial wind and solar projects change hands so often?

- **Information:** inconsistency, no or poor substantiations, omissions and deferral of information on the proponent's web-site and within its documentation, a typical issue with most proposals. Actual experience with operating wind and solar works highlights failures to achieve outputs, meet vegetation screening requirements, undertake frequent vegetation maintenance, achieve deadlines, handle complaints, etc. How can the people most affected for decades by this proposed project be confident of what is proposed versus what will be delivered, when so many points are couched in "get out terms", basic information obscured, omitted or misleading, or significant matters deferred until after approval?

- **Capacity:** A 230MWac solar works is nowhere near equivalent to a new 230MWac base-load coal fired, gas fired or nuclear plant . In fact, a 230MW solar works will only produce electricity intermittently on average over a full year about 30% of the time. Even the 50 years old Liddell power station can currently generate electricity on demand 24/7 over 54% of the time. Modern alternatives can operate above 90%.
  Is it misleading the readers of the EIS and Modification Documents to have not made this point? Would not readers assume that the project's stated 230MW(dc?) capacity would replace 230MWac capacity base-load electricity generation plant?

- **Capacity factor:** capacity factor (CF) is the ratio of an estimated/actual electrical energy output over a given period of time to the maximum possible electrical energy output over that period for a given capacity. No CF was provided by the Proponent. The derived CF for this project is a very high 31.6% (from original EIS capacity of 125MW) over the first full year. Capacity factors reduce with aging of the panels (annual efficiency drops of 0.6 - 0.8%) and equipment, as well as other factors, such as weather patterns changing season to season and year to year.
  Is the CF for the Maryvale project for the first year or an estimated average over the life of the project? What is the estimated life-cycle profile of the capacity factor by year? How can Australians have any faith that this proposed project would achieve the claims made for it when several other projects have not?

- **BESS Issues:** not much is said about the 190-270MW/375MWh battery energy storage system (BESS). The BESS is relatively small in size. If the solar works were hindered by a very cloudy day and suffered a reduced output to, say 20% of capacity, which is a frequent occurrence in the CWO-REZ, then the BESS could only supply to the grid less than 1.63 hours at maximum output before becoming flat. Also, the solar works and BESS poses additional risks to our volunteer Rural Fire Services personnel and nearby residences because the smoke is so toxic. Recent separate fires at a BESS and a CWO-REZ solar works demonstrated how difficult it is to fight fires of these types. They all took extensive resources and time to contain. Slave labour may be used in the manufacture of batteries and solar panels, especially if sourced from Chinese manufacturers.
  What is the real purpose of the BESS? How long will it take to recharge the BESS once flat? Where will the remaining 86% of electricity come from? What is the life expectancy of the batteries in the BESS? Where will the electricity come from to run the air-conditioners and safety equipment when the solar works is idle? Will the project use sulphur hexafluoride (SF6) as a fire suppression gas? How will the extremely hazardous and dangerous lithium-ion batteries be disposed of when they fail or reach their end-of-life after 10 - 12 years? How big would the BESS have to be to ensure continuous supply of electricity from the solar works if, say, a very cloudy period that lasted 72 hours? Why should our RFS volunteers have to face

additional risks to their lives that will be created by your project? Can you guarantee not to use batteries that include cobalt and copper mined by slave labour? Can you guarantee that you will not use solar panels that include the use of slave labour in the making of the solar cells?

Battery unit burns for days, residents warned of toxic sm0ke

DRC artisanal cobalt/copper mines involve slave labour

- **Contamination Ignored:** Overseas studies demonstrate that toxic chemicals leach from damaged solar panels, whether in-situ or disposed of in landfill. Also, zinc contamination of farm soil caused by a solar works prevented the previous crop species from being grown.
  Will the Proponent obtain independent analysis of the soil and water on the site for the toxic chemicals in the solar panels and batteries and have the same analysis done annually for the life of the project for comparison, including publically reporting the results?

- **Construction Jobs:** 400 construction jobs for a peak few months is unlikely to come from the towns, as shortages of trades already exist and will be in demand by other projects too. The cumulative impacts of this project, other REZs potential projects and numerous CWO REZ projects that will result in years of disruption to their lives, and others, damage to roads, loss of tourism, traffic delays, increased food transport costs, etc. The estimated ongoing jobs created by this project is minuscule compared to the jobs already lost in other projects since 2018 (e.g. 3800 Tomlinson Engineering, 2400 Clough) and likely loss of jobs in agriculture activities and services.
  Does the proponent agree that the construction jobs provided by this project is a small return to the communities for a $188m project expenditure with little Australian content and at least $414 million in subsidies over 30 years from Australians?

- **Operations Jobs:** 4 operating jobs for a possible few decades is a poor return for the communities around this project, especially as it is very unlikely all the jobs will be drawn from them.
  Does the proponent agree that the operational jobs provided by this project is a small return to the communities for a $188m project expenditure with little Australian content and at least $414 million in subsidies over 30 years from Australians?

- **Project Life:** claimed life of the solar works is 30 years. Overseas studies of actual solar works lives to date show about 21 years economic life for operational solar works. Solar works proposals in 2020/21 were saying 20-25 year lives.
  What dramatic technology breakthrough has extended solar works lives to 30 years in the last 12 - 18 months, especially as little history exists in Australia to provide factual support for life-time operation in our harsh climate? Why was the life of the BESS also stated as 30 years when clearly 100% replacement will be required once the battery units drop below 70% of original capacity, probably after 10 - 12 years?

- **Project Value:** the project value is around $188 million by completion. It is claimed that billions of dollars of investment from wind and solar will go into the regions, especially the renewable energy zones. However, all such projects are made up of largely imported components. The true investment value for the rural regions is only the Australian content. Some modelling estimates conclude about 10 - 12% is for construction. The rest is imported equipment and capital (funding) costs. Not much Australian content in this project!
  Will the proponent provide the expected final value of the project and details of the expected Australian content by type and value?

- **Sourcing:** The source of the solar works components, BESS, switchgear, etc., is not stated. It is likely that it will be imported through Newcastle Port, about 300km away by road. The high majority of wind and solar works components and batteries are imported from China, the world's largest green house gas emitter and user of slave labour. The source is important for many reasons, including energy and sovereign security.
  From where will the Proponent import all of its components for the project? Does the Proponent source any components from overseas that include materials created from slave labour, such as cobalt and copper used in BESS batteries, from artisan mines in the DRC?

- **Subsidies:** The proponent refers to the Federal Government's Large Scale Renewable Energy Target scheme under which the Proponent would be eligible for one free Large-scale Generation Certificate (LGC) for each megawatt hour (MWh) of electricity exported to the National Electricity System. The LGC can be surrendered for a guaranteed minimum amount or sold on the secondary market. No value for this substantial benefit was provided. Based on the Proponent's original claim of 345,900MWh of electricity produced annually and the minimum surrender price of $40/MWh the project would be subsidised by at least $13.8m each year or even more. Recent price on the secondary market was $60 a LGC. This subsidy alone represents $13.8m - $20.8m a year. A very handsome return for a $188m dollar project. The first PV silicon solar cell was invented in 1954. It had an efficiency of 6%. Current top-tier PV solar panels are about 20%-24% efficient when new. Not a huge improvement in nearly 70 years. Panel efficiency will likely decline by 18%-24% over a 30 years lifetime.
  Would the project be unviable if this subsidy was withdrawn? Can the Proponent please justify the need for subsidies, given that industrial solar works have been operational overseas for decades? When will the solar panels output become uneconomic?

  Subsidies and favourable pricing/cost benefit mechanisms for wind and solar works and their massive necessary backup requirements are paid for by taxpayers, energy consumers and current and future generations through the repayment of government debt and interest.
  What would be the total likely value of subsidies and value of other benefits that the proposed project will receive? Does the Proponent agree that Inter-generational equity is not supported by passing onto future generations huge debts and higher electricity prices as a result of these subsidies? Would the project be unviable if these subsidies and favourable treatment were withdrawn?

- **Supply electricity to 82,000 homes:** The Proponent stated that its project generates enough electricity to power 82,000 average NSW homes. However, no homeowner only wants electricity available on average 7.5 hours a day (i.e. 31.3% of the time at best) with almost none on some very cloudy days, especially in Winter, and none every night, except if the BESS provides an extra hour or two.
  Does the Proponent agree that its statement is either false or designed to mislead the

communities? Where will the electricity come from after the BESS is exhausted?

- **Sustainable, clean, reliable and low-cost renewable energy:** The claim for this project has proven to be false by real world experience. Every country or jurisdiction in the world that has substantially increased electricity prices for consumers by increasing wind and solar electricity capacity beyond 30% of its generation mix.
  In Australia, electricity prices had already doubled by 2021, rose sharply in 2022 and are expected to rise by another 50% or more in 2023/24, even though in the last seven years 95% of all electricity system expenditure has been for renewables. Ever increasing electricity cost to consumers is unsustainable.
  The rare earths, copper, lithium, cobalt, etc. required for the project all have economically finite extraction lives, are extremely energy intensive and toxic to mine, transport, process and convert into usable materials for the project's components. They also are environmentally very damaging as the volume of mining for these extra required metals and minerals is now extensive. Globally, 82% of mining areas, including wilderness areas, are now targeted to extract raw materials for "renewables".
  As the project is weather dependent it cannot generate electricity when required and so it can never be a reliable source of electricity generation. Repeating unsubstantiated claims of other organisations over and over in the EIS, etc. does not change reality.
  Does the Proponent still insist on making these arguably false claims?

Toxic "lakes" in Baotou China from processing rare earths

- **Embedded CO2e emissions:** All proponents claim that their proposed wind or solar project in Australia will reduce annual CO2 emissions by 'x' tonnes/annum. Such claims cannot be true. Electricity generated from fossil fuels has been decreasing for many years as more non-fossil fuel generation plants have become operational. Therefore, each new wind or solar works proposed project must have a lesser CO2 saving in its first year than each operating project. A point will be reached when each new wind or solar project actually increases CO2e as its embedded CO2e cannot be offset by its future electricity production. Just the PV panels require years of operation to offset the CO2e released in their manufacture. Add to this the CO2e released from mining, processing, sea and land transport, aluminium frames, steel piles, cabling, vegetation removal, etc. and one can appreciate that emissions reduction is not the project's strong point.

  In addition, the stated annual CO2 saving of 615,000tpa is for the first full year of operation and therefore is not sustainable over the project's life as coal-fired plants are shut down, more wind and solar works are built and the wind and solar works imports spares, replacement batteries and components from overseas, most likely from China, the world's largest emissions country and largest exporter of wind, solar and batteries in the world. Also, all wind, solar and BESS facilities become less efficient each year, and must be taken into account in assessing the claimed output.
  Will the Proponent provide the amount of CO2e embedded in the project? Include

temporary and long-term loss of CO2 absorbing vegetation removed by the project and the CO2e from mining and transporting the materials included in the supply. Will the Proponent provide an annual lifetime profile of actual net CO2e savings expected from the project?

- **Decommissioning, etc:** It is likely that it will take over 12 months to decommission, and rehabilitate the land and will require similar resources as it took to construct the works. No reference is made as to the time to rehabilitate the land or extent of waste disposal. Currently, solar panels are buried because it is uneconomic to recycle them. The BESS batteries are similarly uneconomic to recycle, but will need replacement 2 to 3 times over 30 years. No costs were provided, but it will be huge, especially in future dollars.
  Will the Proponent provide a suitable upfront bond or similar, indexed to annual cost rises, to cover the decommissioning, rehabilitation and disposal costs? If not, why not?

Conclusion

Our governments state repeatedly that the only substantial reasons for replacing our existing coal/gas/hydro based electricity system with a non-fossil fuel (wind/solar/ BESS/Pumped Hydro) based system is to reduce Australia's CO2e emissions and to lower household and business electricity prices. Therefore, all non-fossil fuel based electricity supply proposals must prove beyond doubt that they satisfy these two fundamental requirements. Comparisons should be against the lifetimes of current replacement technologies, such as an equivalent output from a new HELE, CCGT, nuclear plant or SMR plant. Proof of both CO2e emissions and all-in system costs analysis must be supplied. **The DPE must insist on this verifiable evidence, otherwise the proposals are fundamentally flawed and should be rejected outright.**

Clearly, the proponent's claims of emissions reductions and lowering of electricity prices is not supported with facts. Lowering CO2 emissions and electricity prices has not been achieved by any country or jurisdiction in the world. This proposed project should not be recommended for approval on these two facts alone.

In addition, there are the issues of potentially facilitating the use of slave labour, the impact of wildlife and habitat destruction, the significantly increased fire risks, the unavoidable noise created, the contamination of the environment, the reduction in available agricultural land, lack of Australian content, the energy independence risk and the sovereign security risk of relying on virtually a single source of supply and the cumulative impacts of existing and future wind, solar, BESS and pumped hydro projects.

Taking just the foregoing into account the proposed project is "not fit for purpose" and must not be approved. Other countries recognise these shortcomings and are now turning to better alternatives such as safe, long-life, 24/7 output electricity generation options, including nuclear reactors and in the near future small modular reactors. China alone added 20GW of coal powered capacity in 2021 and is constructing or announced adding 250GW of coal powered capacity. China is also adding 61GW of nuclear plants capacity. The Maryvale Solar Works 230MW(dc or ac?) proposal is merely a flea on an African bull elephant.

Yours Faithfully
Save Our Surroundings (SOS)

Save Our Surroundings (SOS) is a network of community groups across multiple states that share their experiences about, and research into, industrial wind, solar, BESS and pumped hydro proposed and developed projects and their impacts on affected individuals and regional communities.