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From: DIRK HEUBEL [REDACTED]
Sent: Wednesday, 6 December 2023 10:44 AM
To: [REDACTED]
Subject: Elgin Solar Installation at Glanmire, NSW

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Dirk Heubel

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6 December 2023
Independent Planning Commission
submission@ipcn.nsw.gov.au

Re: GLANMIRE SOLAR FARM, submission in response to public meeting 30 November 2023

Dear Committee Members

Thank you for the opportunity to respond to the matters raised in the meeting.

The main issues I have are with fire safety. Lithium ion batteries (LIBs) are hazardous, they can go into a thermal runaway. Whilst the probability of such a catastrophic event occurring is low, the damage from such an event can be from moderate to extremely high. This is because lithium ion battery (LIB) fires cannot be extinguished as they liberate oxygen when their components break down at high temperatures. Highly toxic Hydrogen Fluoride, among other toxins, is also released into the atmosphere.

One other issue is the change to 66 kV transmission lines. These will not be on typical poles, I dare say they will be on towers, greater height being necessary to prevent arcing. I don't recall seeing them on any of the artist impression photos shown at the meeting. How will they be screened? Towers and thick cables will be even more intrusive than the solar panels and will continue across numerous kilometres over other farmers' properties effectively creating a worse nightmarish ugliness with reduced property values for these farmers. Further, what additional infrastructure is required to step up the voltage to 66000v?

Some examples of recent fires caused or contributed to LIBs are:-

Bouldercombe Queensland where 1 of 40 Megapack 3 Megawatt hour LIB batteries caught fire. (The Conversation 28/9/2023)

Airport fire Sydney, this resulted from a stored vehicle LIB, and caused enormous inconvenience to the airport.

Concrete agitator truck converted to LIB power. It caught fire on the freeway. Janus Conversation reported "12 hours to put the fire out". That's not accurate, the fire stops when it runs out of fuel. Firefighters rescue people and prevent the spread of fire, and limit damage by cooling the fire and surrounding equipment. Extinguishing this fire cannot be done.

The "Fremantle Highway", a car carrying ship off the coast of the Netherlands caught fire due to vehicle fire on board. It may not have been started by an electric vehicle but there were 500 electric vehicles on board which are a source of an unstoppable fire. No attempt was made to extinguish the fire. Fire fighters minimized damage to the ship by spraying it with water, until the burning LIB fuel ran out after a week. (They were lucky, there was no

shortage of water in the North Sea, but where would Elgin Energy get water from? From a 20000 litre tank which only meets the statutory requirements for a single dwelling? There are some serious shortcomings in their EIS.)

Morris, USA, large scale warehouse LIB fire. The warehouse included an estimate of between 80 and 100 tons of LIBs amongst other goods being stored. The building is located adjacent to residential areas and the smoke plume touched down between 5km and 10 km from the scene. Between 3000 and 5000 residents were evacuated. Fire fighters realized water was not going to extinguish the fire, in fact it appeared to cause short circuiting and caused further thermal runaways in LIBs. They tried a Class B suppressant known as Purple K. This had no effect on suppressing the fire. Dry cement powder was tried next, and this allegedly extinguished the fire. This fire, together with the 2021 Victoria Big Battery, 2 out of 212 Tesla Megapack fire; the 2023 fire at 40 MWh Salt River Project battery Energy storage system in Arizona U.S. ; 2021 explosion at the Beijing Jimei Dahongmen 25 MWh solar storage charging project; the "Felicity Ace" where 4000 vehicles, including EVs went down with the ship and 2 other LIB related fires resulted in a request for a study. A study based on Lagrangian Plume Rise & Dispersion modeling was conducted. See below list for report authors:

Morris Fire Lagrangian Plume Rise & Dispersion Report by -
Christian Lejon
Daniel Vagberg
Frederik Shonfelt
Birgitta Liljedahl
Leif Perrson
Jan Burman
Daniel Elveron
Joakim Eriksson Rydman
Jan Sjostrom
Oscar Bjornham

The report sought to predict the dispersion and concentrations of the most hazardous substances, namely Hydrogen Fluoride (HF) for a 10 km radius from the fire. Other toxins were not considered due to the uncertainties during their decomposition and combustion. The predictions were confirmed by comparison with samples taken by the fire department on the upwind side of the fire. No samples were taken from the downwind side.

The report's predictions were that the Particulate Matter₂₅ (PM₂₅) was exceeded at the 10km radius and that there would be particulate matter reaching as far as 13 km. It recommends that stakeholders keep developing mitigation strategies.

No mention of Cobalt presence in the smoke was made - the study being limited to Hydrogen Fluoride. Cobalt is a very toxic metal and is a component part of the batteries.

The above examples are not intended to be a detailed analysis of each incident. The readily available newspaper information is scattered over different papers, sometimes inconsistent. The cause of some fires remain unknown and with electric vehicles on ships the EVs have not been proven the cause. What can be concluded is:-

Because LIBs can catch fire either due to heat from a nearby fire or by the overheating, being damage or short circuit, the presence of LIBs in any location has potential to catch fire and enter thermal runaway making it impossible to extinguish by any known means. The fire goes out when the fuel supply is exhausted, to date it cannot be put out by firefighters.

Fire fighters may be able to prevent the spread of fire under favorable circumstances such as ready access to surrounding land and if running water is available. For the subject proposed solar installation, NSW Search and Rescue would need to determine their requirements and concerns. I believe there is no report from Search & Rescue.

LIB fires produce temperatures in excess of 2000 deg C, as against 800 degrees C for most materials. The incipient fire stage reaches a fully developed fire stage very quickly. Early warning of fire is paramount importance.

Hazardous smoke, in particular Hydrogen Fluoride, can reach a distance of 10 km. The smoke plume modeling led to a recommendation for stakeholders to keep developing mitigation strategies. But that was for an existing building! The correct solution to eliminate risk to residential development is, comply with the requirement to NOT build hazardous industries within 10 km of a town's residences nor in a bushfire prone area.

There is no fire suppressant for LIB fires.

There is much more that needs to be done research wise. The report resulting from the Morris fire is only the beginning. As explained below, it is important to have correct and relevant legislation in place.

Unlike the Morris, USA fire located in town, smoke would have alerted someone nearby to dial 000 early (999 in U.S.A.), the fire may not be detected early enough to prevent its spread in the subject location.

From the above it can be concluded that the Glanmire Solar Farm E.I.S. has not addressed fire safety issues relating to a runaway fire. There are laws in place that prohibit the use of bushfire prone land, and land within 10 km from a residence (as expressed by one of the speakers at the meeting) from being used for hazardous industry. Both these laws were passed for good reasons and both are being broken, without any scientific research being carried out to factually determine the risk being created. The above mentioned study is only one small piece of the puzzle, e.g. different wind speeds; and temperature variations that come with hilly terrain could make this situation worse. It must be noted that pollutants other than Hydrogen Fluoride were not included in the study.

Additionally, controlling grass fires within the development has not been considered. In general, fire fighting action by the NSW Rural Fire Brigade (RFS) may need to include back burning, clearing with a bulldozer or the use of aerial water bombing. The first two are likely to be destructive to the installation hence not useful options, and water bombings may be ineffective due to the shielding effect of the solar panels, hence trials need to be carried out in conjunction with the RFS to determine the requirements for this to control a fire. If the developer proposes sheep will control the site of grass fire risk, visit any overgrazed farm and note the presence of weeds, especially tussocks and other equally flammable native weeds that are unpalatable to the sheep. Expect eucalyptus to grow and these are extremely flammable. By who and how are weeds going to be controlled? Can a tractor with a slasher be used among the panels? Further to comments heard regarding the use of the farmer's private driveway along the fence as part of the required buffer I am far from convinced that it is legal under EP&A Act. Approval can only be given for building works and use of the property with the application, not on the property of the neighboring farms.

The DA has given a de facto approval for the use of the neighboring property as a buffer zone, without the owner's consent. The public roadway is also being used as part of the buffer zone. The speaker Tim Averill from Elgin Energy did not reveal how this was achieved. I am not aware that a D.A. for the subject proposal can include development on a different property across a public roadway (nor adjoining properties). This is development on Brewongle Lane as well without any legitimate approval process. I will explain why this development needs an occupation certificate as well as the need to update relevant legislation.

All structures excluding single occupancy dwellings, carports, and class 1c structures require fire safety measures in accordance with the Building Code of Australia (BCA). Each Fire Safety Measure specifies a standard of performance e.g. an Australian Standard, the BCA, a Council Fire Order, or an Alternative Solution that the measures must comply with.

The Fire Safety Measures are recorded on a Fire Safety Schedule (FSS). On completion of a building and issuance of a Fire Safety Certificate (FSC), an Occupation Certificate together with a Fire Safety Schedule (FSS) is issued. Councils are required to record these, and henceforth request an Annual Fire Safety Statement (AFSS) from the owner of the property 12 months from the date of the FSC issued with the Occupation Certificate. Heavy escalating fines apply if the AFSS is not received on time. The OWNER of the subject property is NOT Elgin. I doubt the Owner of the property is aware of this legislation, plus any future owner, in the event that Elgin sells the project, will need to comply with this legislation.

Each LIB on this site is a class 1c structure, but contrary to the more typical class 1c structures e.g. a flag pole, a crane or railway crossing boom gates etc. these structures are a hazardous industry which legislation has not caught up with. The need for fire safety is recognised in the application, but the required fire safety measures have not

been scientifically assessed. There are no fire safety measures listed in the BCA or EPA legislation for this type of development - the EP&A Act and Legislation still have to catch up with development of this nature. Hazardous industries such as an oil refinery have their own trained personnel and purpose developed fire safety measures usually in conjunction with Fire & Rescue. The nature of such hazardous buildings is not covered in the BCA.

The development requires the use of a strip of land along the adjoining boundary fence to remain a farm road and not be used for any other purpose. That would require each property owner's consent for a DA to be submitted. On approval of the proposed use of that part of the neighbor's property as a "buffer zone" and completion of any works required (under a Construction Certificate with attached FSC, an Occupation Certificate together with FSS can be issued. Council is thenceforth obliged to request an AFFS every 12 months after the date of the FSC from the Owner of the neighboring property at the Owner's expense if Council introduces or enforces a fee for this service), and seek compliance by issuance of escalating penalty infringement notices or a Fire Safety Order on the neighboring farm(s). If compliance is not obtained which can lead to prosecution in the Land & Environment Court is the next stage. If the owner decides to convert to an olive farm (an example of something flammable with intense heat), there is nothing that can be done by Council, unless a DA and the AFSS process are legally in place. From then on, responsibility lies with the owner of the neighboring property, current or future, unlike "agreements" which lapses with transfer of ownership.

The situation with Brewongle Lane may be more complex, being under the Roads and Traffic Act as well, but the need for the prevention of the spread of fire by means of a buffer zone remains the same. Non maintenance of any fire safety measure under a legally approved process (as assessed under the approval process of a required DA and/or Construction Certificate), would have to be enforced by one and the same entity, both the owner and the statutory authority. This is a conflict of interest.

It can be concluded that there is a high risk of the spread of both fire and smoke if this development goes ahead without the proper approval requirements in place. It must be remembered that the owner cannot be compelled to agree to the necessary development on their property and that there are numerous issues with the proposal including being a hazardous industry in a bushfire affected area and within 10 km of a residences. Not only is 20000 litres of water inadequate but there seems to be no proposed pump, reticulation system, nor fire and smoke detection system.

I strongly object to Elgin developing a solar installation anywhere at Glanmire, New South Wales, or anywhere east of the boundary set by the New South Wales Government already specifically for such projects, and ask that this development be refused.

D Heubel