Dear Sir/Madam,

We are a collective of farmers and land-owners residing in Barnawartha North, which has recently become an area targeted for development of solar farms. Collectively we own farms with an area of 4,765 hectares in the region.

We thank-you for the opportunity to provide comment on the draft Solar Energy Facilities - Design and Development Guidelines (‘the Draft Guidelines’), and applaud the Victorian Government on its efforts to clarify planning approvals for solar farms. In addition, we support the Victorian Government’s targets to transition to renewable energy, including solar energy.

We are not opposed to the development of solar farms in our region, if done well. We view solar farms as a potential way to diversify income on our farms. Nevertheless, we are concerned about the potential thermal and radiative impacts of solar farms on neighbouring farmland. We believe that such concerns are not adequately reflected in the Draft Guidelines. Our comments are summarised below:

**Section 7.2.2**

**Comment:** Section 7.2.2 of the Draft Guidelines make mention of electromagnetic radiation from “transformers and inverters”, and it then goes on to cite the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) in advising that “the strength of these fields will decrease with distance from the source and become indistinguishable from background radiation within 50 metres for high-voltage power lines and within 5 to 10 metres of substations.” It is noted that a solar farm includes numerous other components beyond the power lines and substation that may emit electromagnetic radiation (such as the panels themselves).

**Recommendation:** Section 7.2.2 of the Draft Guidelines should be revised to include guidance on appropriate buffer distances for all components of a solar farm, not just the substation.

**Section 7.2.3**

**Comment:** In relation to the temperature impacts of a solar farm on surrounding land, the guidelines state that “there is little evidence of impacts on other land uses such as orchards due to heat dispersal from solar energy facilities” (p.28). While this statement is technically correct, we believe the statement is somewhat disingenuous, as this appears to be a very new area of research. A review of publications on Google Scholar reveals that there have been very few empirical studies conducted across the globe that have examined the impacts of solar farms on temperature in

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1 Since construction of substation next to the Logic Centre in Barnawartha North, there has been a high level of interest in the development of solar farms in our locality. Most notably, the Wodonga City Council (via Wodonga Solar Farm Pty Ltd) has applied for a planning permit for construction of 126.8 hectare, 158,000 panel solar farm at 229 Lady Franklin Rd Barnawartha. In addition, in the lead up to Victoria’s renewable energy auction, there was at least one other solar farm planned for construction at Barnawartha North. The development was ultimately not successful in the auction, and is therefore believed to be on-hold at present.
surrounding areas. For example, a model-based study conducted by Fthenakis & Yu (2013) found that “The data also show a prompt dissipation of thermal energy with distance from the solar farm, with the air temperatures approaching (within 0.3 °C) the ambient at about 300 m away of the perimeter of the solar farm.” The only empirical study that could be found was conducted by Barron-Gafford et al (2016), who noted that “there is a remarkable lack of data as to whether or not the PVHI [PhotoVoltaic Heat Island] effect is real or simply an issue associated with perceptions of environmental change caused by the installations that lead to “not in my backyard” (NIMBY) thinking.” The study found that annual temperatures were on average 2.4 °C higher in the solar farm, than in the surrounding land. The warming was greatest at night, and during the warmer months (average 3.5 °C higher in the solar farm). The study concluded that there were indications of a PVHI effect, but it was not possible to conclude whether this impact extended to surrounding land.

**Recommendation:** Given the lack of research on the temperature impacts of solar farms on surrounding land, we recommend that the Precautionary Principle should be applied in this case. The Precautionary Principle is described in Principle 15 of the Rio Declaration on Environment And Development (to which Australia is a signatory), as follows: “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

To this end, Section 7.2.3 of the Guidelines should include a recommendation that all solar farms implement an independent monitoring program on surrounding land. The monitoring program should assess the impact of the solar farm on temperature, radiation and possibly also wind. Should any statistically significant impacts be observed, we suggest that there should be mechanisms for compensation to affected parties.

Given the potential compounding impact with climate change, we suggest that the language in the Draft Guidelines should be strengthened. At present, the wording is very weak, and unlikely to result in a high level of compliance.

Again, we thank-you for the opportunity to provide comment on the Draft Guidelines, and we hope that you will take our comments into consideration.

Sincerely,

The landholders of Barnawartha North.

**Signatories below.**

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3 Barron-Gafford, G. A. et al. The Photovoltaic Heat Island Effect: Larger solar power plants increase local temperatures. Sci. Rep. 6, 35070; doi: 10.1038/srep35070 (2016). Available at: [https://www.nature.com/articles/srep35070](https://www.nature.com/articles/srep35070)


5 Follow up enquires can be directed to: [Follow up enquires can be directed to](mailto:Follow up enquires can be directed to)
The landholders of Barnawartha North

Signatories below.