BALANCED ROCK
POWER

“Solar Heat Islands” Explained

Solar projects do not raise ambient temperatures outside of the project boundaries. The panels and surrounding air may get a few degrees hotter in the sun, but the effect is highly localized and will return to ambient temperatures at night with no sustained heat effect that is characteristic of “heat islands.”

- Solar projects creating “Heat Islands” is a common concern related to large solar projects stemming from a few widely shared articles online.
- These articles describe research that has shown that small increases in ambient temperature can occur within some solar arrays at certain times of the day and year, specifically in the area between the modules and the ground where heat can be “trapped.”
- Importantly, the research states that the effect is limited to the interior of the solar array near the ground, and outside the solar array it is undetectable within 100 ft.
- This small effect is primarily caused by a lack of vegetation under and around the solar arrays, so Projects like Taelor Solar that will retain native plants and grass vegetation under the modules will experience only a fraction of this already small effect.

Additional Background and References

An article with the title *“Researchers discover solar heat island effect caused by large-scale solar power plants”* is shared frequently online[1].

This article is a summary of research that was performed on a utility-scale solar power project in a desert environment in Arizona, a project where 100% of the vegetation under the solar array had been removed. The underlying research clearly points out that the lack of vegetation was a primary driver of the effect they identified[2,3]:

“The [Solar Heat Island] effect is largely driven by the absence of vegetation and the vegetation’s potential to cool the atmosphere through transpirational water loss.”

In addition, the authors of this research have concluded that solar projects that retain vegetation under the arrays would behave very differently[3, Fig 1]:

“Leaving the grasses under the panels should greatly reduce the [Solar Heat Island] effect within the solar farm, which will serve to only assist in any reductions in the spatial extent of the [Solar Heat Island] effect outside of the array.”

For the unvegetated project in Arizona, the researchers did identify a temperature increase within the solar array between the modules and the ground where heat can get "trapped" and the unvegetated ground cools less efficiently. However, the researchers have subsequently clarified that the effect does not extent outside the array[3, Fig. 2]:

"We found that the [Solar Heat Island] was indistinguishable from air temperatures over native vegetation when measured at a distance of 30m (100ft) from the edge of the PV array."

References:

1. https://phys.org/news/2016-11-solar-island-effect-large-scale-power.html
2. https://www.nature.com/articles/srep35070
3. https://greatershepparton.com.au/assets/files/documents/planning/solar/Barron-Gafford_Research_Group_Report.pdf

Figures:

Fig 1. Revegetation substantially reduces the small temperature increases under a solar array

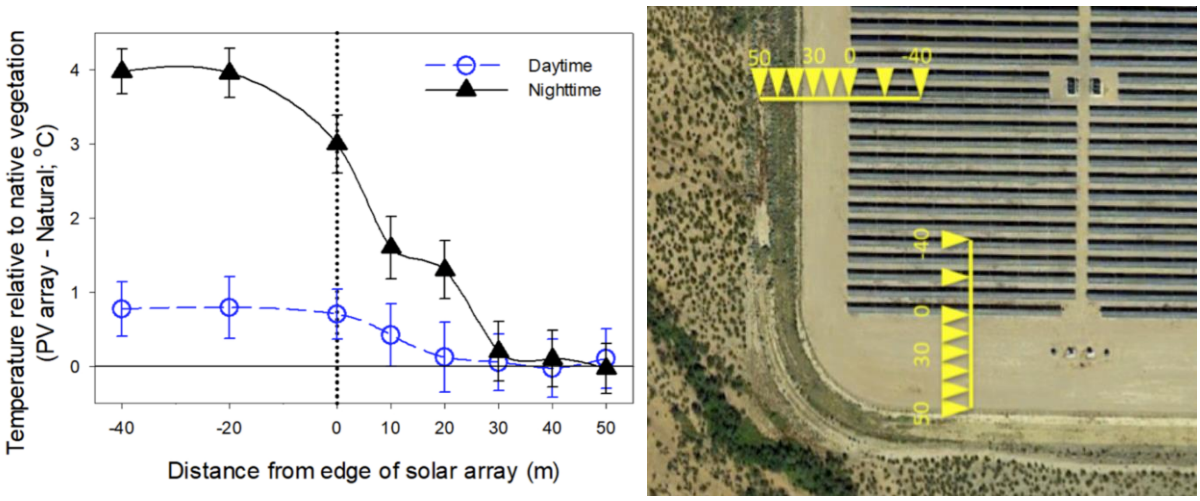

Fig 2. The small temperature increases observed at an unvegetated desert project was negligible within 100 ft of the edge of the solar array