

Update on the Solar Cells Reporting Summary



To improve the usefulness of the Solar Cells Reporting Summary as a standalone report, we now ask authors of relevant manuscripts to include experimental details in the Summary, and we have updated some of the requested information.

In 2015, in discussion with experts in photovoltaics, editors in the Nature Portfolio developed the Solar Cells Reporting Summary (www.nature.com/nature-portfolio/editorial-policies/reporting-standards)¹. Its aim was to improve transparency and reproducibility in the field. The document is a checklist of key technical and procedural information about the characterization of photovoltaic devices – their area, the testing environment, and so on – that is filled in by authors of manuscripts reporting solar cell performance.

Originally, the Solar Cells Reporting Summary was intended for editors and peer reviewers to ensure that manuscripts meet the assessment and reporting standards expected by the community. However, a few years later, we started publishing the document alongside the paper. The aim was to give readers a quick summary of the characterization procedures and relative technical and statistical information of a study.

In earlier versions of the Summary, authors confirmed that key technical and procedural details are reported in the manuscript by checking a ‘Yes’ box or marking an entry as not applicable. They also had to include a comment about where the details can be found in the text, or why the requested detail is not reported or relevant to their study. Over the years, we noticed that some authors used the comment box not only to indicate where details can be found in the manuscript,

but also to directly provide the relevant information.

This latter use of the document makes it not just a checklist but more a summary of key information and metrics, providing essential details in a single place. We and other editors across the Nature Portfolio believe that this is more useful to both reviewers and readers: it not only ensures transparency in reporting the results, but also allows a quick assessment of the solar cell data presented in a study, avoiding the need to go back and forth between the Summary and the main files.

Thus, we now ask authors not only to confirm whether a piece of information is present in the manuscript and where it can be found, but also to report the technical and procedural details in the Summary. We believe this change will make the Solar Cells Reporting Summary more useful as a standalone report.

As mentioned, the creation of the Summary was a community-driven initiative. Conversations with experts in photovoltaics were crucial both to identify issues in the characterization and reporting of solar cells and to develop a solution to address it. We acknowledge, however, that what is considered ‘best practice’ and the type of information that is deemed important change over time as research in the photovoltaic field advances. Therefore, following suggestions received from the community in recent years, we have also taken the opportunity to revise parts of the Summary.

In particular, we now ask authors not only to report the area of the tested solar cells but also to indicate the type of area calculated, for example, total area, aperture area, active area. These areas differ in the portion of the solar cell and its components – for example, active material, interconnects – that are illuminated during the tests for measuring the power conversion efficiency. The type of area is thus an important detail to compare

performance of different devices. This request is also in line with other reporting such as the solar cell efficiency tables reported in *Progress in Photovoltaics*².

We are also now requesting authors to specify not only the number of solar cells tested but also the number of individual substrates. More than one solar cell can be fabricated on one substrate or different solar cells can be fabricated on different substrates. In the latter case, batch-to-batch variability of substrates would factor into the average value and distribution of the power conversion efficiency of the tested solar cells and hence it is an important piece of information that needs to be specified.

We hope that the Solar Cells Reporting Summary has been useful to promote transparency and reproducibility in the photovoltaics field and can help support other initiatives around reporting standards. We consider the Summary an important part of our wider efforts to address the needs of the scientific community in terms of transparency and reproducibility through, for example, the promotion of data and code sharing³.

We want to ensure the Summary – as well as the other initiatives we put in place – continues to be of practical relevance not only to present photovoltaic technologies but also to future photovoltaic materials or device architectures. Therefore, it is important for us to keep this conversation ongoing, through discussions with the photovoltaics community at relevant meetings and conferences and by welcoming feedback from experts, to understand when and if updates or new tools are needed.

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References

1. *Nat. Mater.* **14**, 1073 (2015).
2. Green, M. et al. *Prog. Photovolt.* **29**, 3–15 (2021).
3. *Nat. Energy* **6**, 325 (2021).