

Performance Data for Solar Photovoltaic Systems: Acquisition, Access, and Sharing

IGAP Request for Information Snapshot

November 3, 2022

Department: US Department of Energy (DOE)	Agency: Solar Energy Technologies Office (SETO)
Application Deadline: November 18, 2022	Docket Number: DE-FOA0002876

Summary

The U.S. Department of Energy (DOE) Solar Energy Technologies Office (SETO) is requesting information on the cost and value of acquiring, accessing, and sharing solar photovoltaic (PV) system performance data. These responses will help inform SETO activities relevant to PV system performance and related data to accelerate research, development, and deployment of solar energy.

Background

Access to high-quality data on the real-work performance of solar PV systems can be limited or difficult to obtain. To overcome this challenge and increase access to comprehensive PV system performance data, SETO is soliciting information and comments from stakeholders to understand their needs regarding use, collection, and sharing of this data.

Who Should Respond

SETO seeks responses from all interested stakeholders in industry, academia, government, research laboratories, and more, including data owners, data users, and system owners, operators, and developers.

Response Guidelines

Respondents are requested to provide the following information at the start of their response to this RFI:

- Company / institution name
- Company / institution contact
- Contact's address, phone number, and e-mail address

Responses must be provided as a Microsoft Word (.docx), or Microsoft Word compatible, attachment to the email, and no more than 4 pages in length, 12-point font, 1-inch margins. Respondents should identify their answers by responding to a specific question or topic if applicable.

Key Questions

Respondents do not need to address every question to submit a response.

Category 1: Cost and Value of Data *(from a data owner perspective)*

- What would be the estimated cost of curating a multi-year, high-quality dataset for a PV system, where that data set is captured at sampling rates of at least one reading every 15 minutes and contains readings from components such as the AC meter, the AC output of the inverter(s), the DC input(s) of the inverter(s), and the weather station?
- What, if any, would be the added cost per MWDC associated with collecting, storing, and curating data for:
 - tracker position
 - string- or combiner-level DC information
 - energy flows to and from energy storage (if applicable)
- Opportunity cost of data sharing:
 - What is the perceived opportunity cost or burden for publicly sharing a data set containing historical values (with a lag of at least one year)?
 - What is the source of the opportunity cost?
 - How does recency affect the opportunity cost? (i.e., is there a time lag of a certain number of years after which the opportunity cost drops to zero?)
 - Would collecting less precise information help reduce that cost? (e.g., location recorded as gross coordinates with just two decimal places instead of an address or 4 decimal place precision, normalization of power and irradiance values instead of raw values)
- Operations and maintenance information:
 - Aside from cost concerns, what would stand in the way of sharing operations and maintenance information that is concurrent with the time series datasets?
 - What would be the estimated cost of curating that dataset?

Category 2: Access, Availability, and Value of Data *(from a data user perspective)*

- If you are performing or plan to perform R&D related to the performance of PV systems, do you have sufficient data for analysis and validation? If not, what is the most critical missing information? (e.g., length of collection time, variety of system types, sizes, and locations, number of observed variables, completeness and/or fidelity of data)
- What are the minimum and optimum sets of PV system performance variables collected from a standard non-residential PV system (anything bigger than 50 kWDC) that are necessary to perform and validate your R&D project (e.g., modeling of output of DC field, inverters, or entire systems, modeling of impact of soil and snow, identification, classification, and prediction of performance anomalies)?
- What is the value of collecting high-quality time series data from residential systems at higher sampling rates (at least one reading every 15 minutes), given the lack of ground sensor-based irradiance measurements from such systems?
- What are unique parameters regarding the performance of residential systems that cannot be estimated from models or lab-scale prototypes?
- Accessibility of large datasets:
 - How much value would be added by an interactive interface for accessing large datasets if that data is already otherwise accessible and accompanied by high-quality metadata (e.g., through an Application Programming Interface—API—or directly from a data repository)?
 - Do you know of any examples of interactive interfaces for accessing time series data that you consider exemplary?
- DOE and other federal, state, and local government organizations collect and publicly share some environmental data (e.g., high-quality irradiance data available from the Surface Radiation Budget (SURFRAD) and SOLAR RADiation (SOLRAD) networks). Is there a need for additional environmental data that could be collected by government agencies that is not currently captured at a sufficient granularity, rate, and quality, or at all?

Category 3: Value-add Ancillary Datasets *(from a system developer/owner perspective)*

- Unavailable data
 - What data is not currently collected by the operators of your assets that could provide additional value?
 - What advantage could this data provide for the operation and long-term value of the assets?
 - What are the barriers to collecting or accessing those data sets?
 - How does an aerial inspection of the asset impact its optimal operation?
 - In your experience, what (if any) is the desired frequency of such an inspection?
 - Extreme weather impact
 - Do you collect data about damage inflicted by extreme weather events, such as hurricanes, derechos, large hail, or floods?
 - If so, what would be the optimal way to leverage the data to support more resilient PV systems?
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How to Submit

Responses to this RFI must be submitted electronically to SETO.RFI.PV@ee.doe.gov no later than 5:00 p.m. (ET) on November 18, 2022. Responses must be provided as attachments to an email.

Resources

- [Request for Information on the EERE Exchange](#)
- [DOE Announcement of the RFI](#)