

2024 POWER Global Community Summit Summary Report



About POWER: The Prediction Of Worldwide Energy Resources (POWER) project, a cornerstone of the NASA Earth Action Program, focuses on improving the public and private capability for integrating NASA Earth observations and research into renewable energy, sustainable infrastructure, and agroclimatology related decisions. POWER provides NASA's no-cost, trusted low-latency solar and meteorological datasets, community specific derived data parameters, geospatial web data services, and a variety of analytical tools to its user communities. These datasets have global coverage and span across a long time series temporally. POWER distributes data in several formats with a large variety of openly available accessibility options, making them Analysis Ready Data that enable critical energy and agricultural decisions worldwide.



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Executive Summary

The 2024 POWER Global Community (GloCo) Summit was hosted virtually on November 6 and 7 and offered an array of presentations and sessions to spark conversation and connection. One of the key objectives was to inform users of the latest enhancements to data product and service offerings. POWER also hosted this event to hear how users leverage POWER data through community-driven lightning talks, collect feedback and capture new and future emerging user needs.

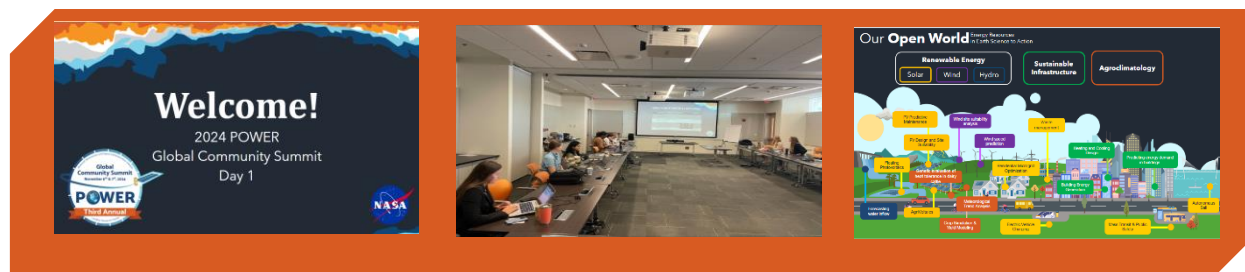
The 2024 GloCo Summit had over 305 registrants from over 50 countries and was attended by 137 unique participants over the two days. To begin the summit, Shanna Combley, NASA Energy Resources program manager, gave opening remarks on what NASA Earth Action (EA) is and its impact on program structure and decision making. It was followed by a presentation from NASA POWER's Chief Scientist, Dr. Paul Stackhouse, of the history of POWER, its current capabilities, and a glimpse into future plans. The POWER development team then showcased technical demonstrations on the suite of POWER tools including the Application Programming Interface, Data Access Viewer, and image services.

Over the two days, four keynote presentation were made on how POWER supports their organizations, missions, and projects by Dr. Ralph Muehleisen from Argonne National Laboratory (ANL), Dr. Michael Bosilovich from NASA Goddard Space Flight Center (GSFC), Ryan Danks from Rowan Williams Davies & Irwin Inc. (RWDI), and Cynthia Rosenzweig from NASA Goddard Institute of Space Studies (GISS). Dr. Ralph Muehleisen presented on Argonne's use of POWER data for storage sizing projects and sustainable energy solutions. Dr. Michael Bosilovich's presentation described plans for the Earth System Reanalysis at the NASA Global Modeling and Assimilation Office. Ryan Danks presented on how RWDI uses POWER data for high performance building design, while Dr. Cynthia Rosenzweig's presentation focused on the ways in which POWER supports the Climate Adaptation Science Investigators (CASI) team.

Twelve unique lightning talks from POWER's user community were given; these presentations detailed how users apply POWER's data, tools, and services in support of their missions.

On day two, four individuals were presented with the NASA Recognition of Excellence Awards for RETScreen® expert users. The awards recognized exceptional achievements in utilizing solar and meteorological datasets provided by the NASA POWER project in conjunction with the RETScreen® Clean Energy Management Software. The three award categories include Facility Owners and Operators, Service Providers and Facilitators, and Educators and Researchers.

Each of the various sections of the meeting are summarized in this report, and the complete agenda can be found in Appendix A.





Event Description

In November 2024, the NASA POWER project hosted its 3rd annual GloCo Summit to connect members of the renewable energy, sustainable infrastructure, and agroclimatology communities and share information on service enhancements and data updates. The free two-day, virtual GloCo Summit was designed to provide users with a diverse range of sessions, thought-provoking discussions, and feedback opportunities.

At this event, attendees:

- Learned about POWER's latest enhancements to data product offerings, including the new version of the DAV, the development and integration of future climate projections, and the new PaRameter Uncertainty ViEwer (PRUVE) tool.
- Heard how users are utilizing POWER data in their missions across the globe through community-driven lightning talks.
- Engaged with users from the POWER community as well as POWER Project leaders and team.
- Helped derive future enhancements during an interactive feedback session.

In addition to keynote speakers and POWER user lightning talks, the POWER team provided an overview of the project's history, its capabilities, a glimpse into future developments, and a technical showcase that demonstrated how to use certain tools, like the DAV and API.

The official 2024 GloCo Summit website containing the agenda and event recordings is located at <https://power.larc.nasa.gov/global-community-summit/>.

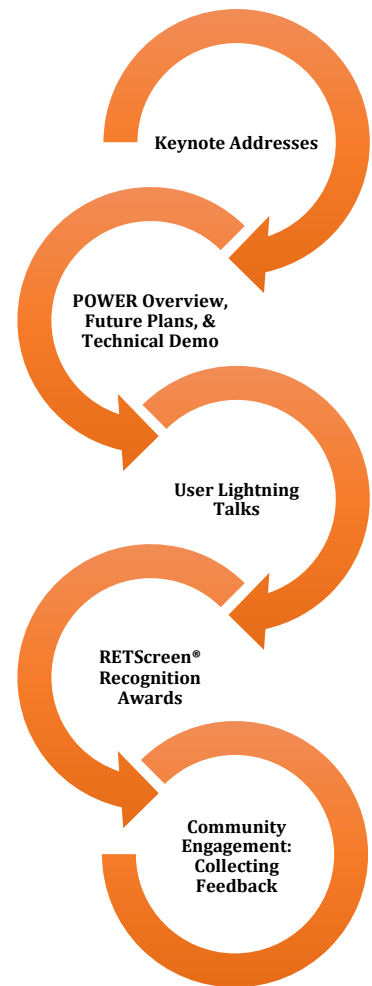


Figure 1. Session Highlights

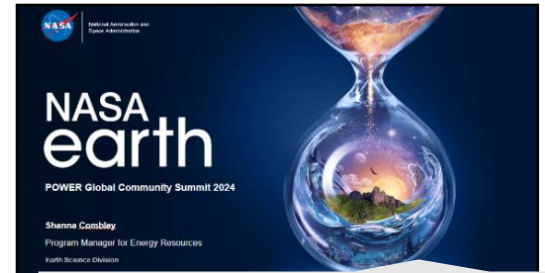


Keynote Addresses

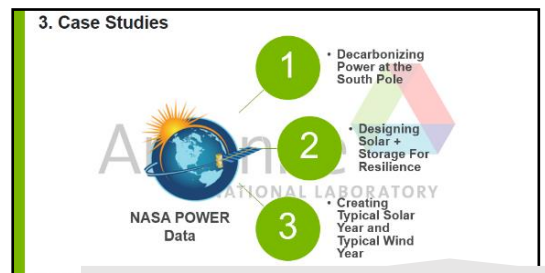
Established partners and advanced users were invited to present keynotes to dive further into how the project has been a key resource for their organization and its impact on their work.

On the first day, Shanna Combley, program manager for NASA Energy Resources, provided opening remarks and detailed how NASA Earth Action is using Earth science to support policy and decision making to better society. She also provided background information on the different Earth Action strategies and the program she oversees, Energy Resources, and how POWER fits into them. The first keynote of the event, Dr. Ralph Muehleisen, a chief building scientist from Argonne National Laboratories, presented on how they use POWER data for storage sizing projects and sustainable energy solutions. Dr. Muehleisen highlighted three projects specifically: Decarbonizing power at the South Pole, designing solar storage solutions for increased energy resilience, and creating typical solar year and typical wind year. The second keynote of day one was Dr. Michael Bosilovich, a meteorologist at NASA Goddard Space Flight Center. Dr. Bosilovich presented on plans for the Earth System Reanalysis at the NASA Global Modeling and Assimilation Office (GMAO). POWER uses historical meteorological parameters from MERRA-2 reanalysis and near-real-time data from GEOS-IT.

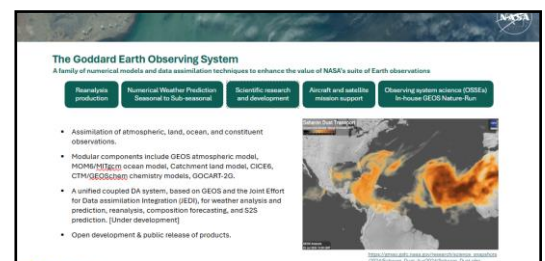
On the second day, Associate Principal and Global Practice Leader of Building Performance Ryan Danks from at RWDI, presented "Solutions for the Built Environment." His talk detailed how RWDI uses POWER data in conjunction with their in-suite tools for high performance building design. The last keynote of the 2024 GloCo Summit was Dr. Cynthia Rosenzweig, a senior research scientist at the NASA Goddard Institute for Space Studies, and focused on the Climate Adaptation Science Investigators Workgroup (CASI). She explained the ways in which POWER supports the CASI effort, and its capabilities for predicting future climate around NASA centers.



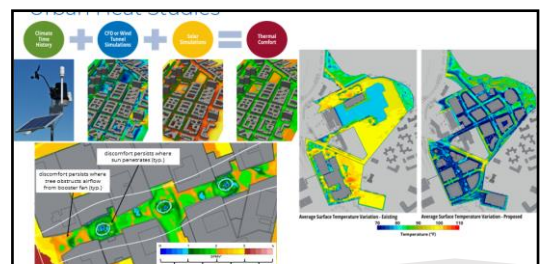
Shanna Combley started the event with a presentation on Earth Action, a new program element of NASA's Earth Science Division.



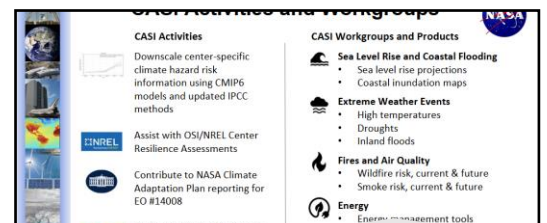
Dr. Ralph Muehleisen presented on ways Argonne National Labs uses POWER data.



Dr. Michael Bosilovich presented "Status and Plans for the Earth Reanalyses at the NASA GMAO."



Ryan Danks presented on solutions for the built environment and use of POWER data



Dr. Cynthia Rosenzweig, presented "Linking Climate Models with Decision Making Through NASA's CASI Workgroup."

Figure 2. Keynote Speaker Presentations



Keynote Speaker Biographies

**Dr. Ralph Muehleisen, Argonne National Laboratory**

Dr. Muehleisen is the chief building scientist and the Building and Industrial Technologies group leader in the Energy Systems and Infrastructure Analysis division at Argonne National Laboratory. In his role, Ralph leads research and development to economically improve the sustainability and resilience of the built environment while improving the life of its citizens, especially in response to the effects of climate change.

**Dr. Michael Bosilovich, NASA Goddard Space Flight Center**

Dr. Bosilovich is a meteorologist at Goddard Space Flight Center's GMAO. While studying meteorology in college, he became passionate about numerical prediction, which applies computers and code to simulate weather. Presently, he works with reanalysis that attempts to bring out the best of models and observations of weather and climate. He is working on the NEWS Regional Water Cycle Study to evaluate and explain the MERRA reanalysis representation of the U.S. regional water cycle. As principal investigator for the NASA/GMAO National Climate Assessment Enabling Tools project, Dr. Bosilovich is also working on the reanalysis synthesis of NASA Earth Observing System observations to support the National Climate Assessment and demonstrate utilization of reanalysis data to address sector weather and climate.

**Ryan Danks, RWDI**

Ryan Danks is an associate principal and the global practice leader for building performance at RWDI. A specialist engineering consultancy focused on how climate, people, and the things we build interact, RWDI leverages this understanding to help clients craft indoor spaces, buildings, and even entire cities that respond to climate to maximize performance and minimize their environmental footprint. Ryan's work involves the use of a wide range of simulation tools to help architects and urban planners create climate aware designs that emphasize energy efficiency, comfort, and walkability in projects covering every continent.

**Dr. Cynthia Rosenzweig, NASA Goddard Institute for Space Studies**

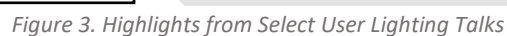
Dr. Rosenzweig is a senior research scientist at the NASA Goddard Institute for Space Studies, where she heads the Climate Impact Group. She is co-chair of the New York City Panel on Climate Change, a body of experts convened by the mayor to advise the city on adaptation for its critical infrastructure. She created and leads NASA's CASI workgroup. She co-led the Metro East Coast Regional Assessment of the Potential Consequences of Climate Variability and Change, sponsored by the U.S. Global Change Research Program. Dr. Rosenzweig was a coordinating lead author of the Intergovernmental Panel on Climate Change's Fourth Assessment Report Working Group II. She is co-director of the Urban Climate Change Research Network, co-editor of the first and second Urban Climate Change Research Network Assessment Reports, and co-chair of the Urban Thematic Group of the United Nations Sustainability Development Goal. She serves as chair of the Board of the New York City Climate Museum and was named one of Nature magazine's 10 People Who Mattered in 2012 for her work preparing New York City for climate extremes and change. A recipient of the Guggenheim Fellowship, she joins impact and climate models to project future outcomes of land-based and urban systems under altered climate conditions. She is a professor at Barnard College and a senior research scientist Columbia University's

Figure 3. Keynote Speaker Biographies



Members of POWER's user community were invited to present three-to-five-minute lightning talks showcasing how POWER's DAV, API, Amazon Web Services Open Data Registry, and geospatial services are being used across the globe. **Twelve users gave talks during the event, representing the renewable energy, sustainable infrastructure, and agroclimatology communities.**

Topics of the lightning talks ranged from predicting solar power output, retrofitting vertical axis wind turbines, modeling microclimates for agrivoltaics, and applications to help determine solar sizing. Below are highlights of select talks. A full list of 2024 GloCo Summit lightning talks can be found in Appendix B.





NASA RETScreen® Recognition of Excellence Award

The summit featured NASA Recognition of Excellence Awards for RETScreen® Expert Users in three categories: Facility Owners and Operators, Service Providers and Facilitators, and Educators and Researchers. Four individuals were selected to receive the award due to their exceptional achievement in utilizing solar and meteorological datasets from NASA's POWER project in conjunction with the RETScreen® Clean Energy Management Software platform, a longtime POWER partner.

Candidates from RETScreen®'s more than 850,000 global users were nominated by the RETScreen® team based upon the impact of their work. The nominees were then reviewed by the NASA POWER team for final selection. Each awardee showcased their work in a brief presentation, highlighting their success in utilizing POWER data in their various projects. Before the awardees were presented, Gregory Leng, creator and director of the RETScreen® Clean Energy Management Software Platform, provided an overview of the software, which directly links to POWER data needed for a variety of benchmark, feasibility, energy performance and portfolio analysis. Shown below are details of the award categories, certificates, and a slide from each awardee presentation.

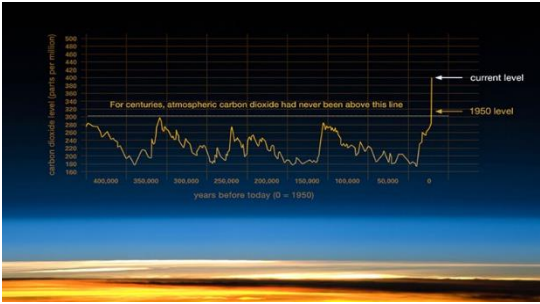
Facility Owners & Operators Category



The certificate is from NASA POWER Project and RETScreen International, recognizing Mats C. Striegler, Senior Advisor in the Directorate of Portfolio Innovation, Infrastructure and Environment Group for the Department of National Defence / Government of Canada. It is signed by Dr. Karen M. St. Germain, Director, Earth Science Division, NASA, on November 7th, 2024.

There has been a rapid uptake by energy, facility, and sustainability managers at public and private sector enterprises, who use the RETScreen® Clean Energy Management Software and NASA POWER for portfolio-wide energy and greenhouse gas management.

Mats Striegler and Cynthia Princiotta, members of Canada's Department of National Defence (DND), presented "Managing Energy in Canada's Largest and Most Energy Intensive Institutional Portfolio."

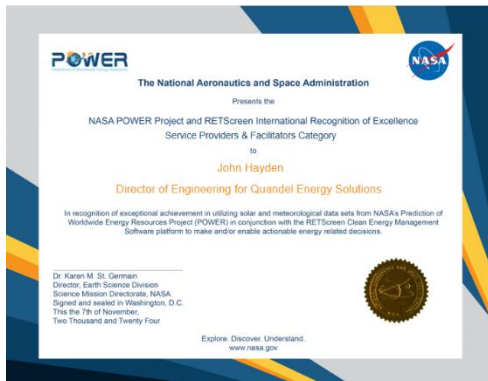


The graph shows carbon dioxide levels (ppm) on the y-axis (0 to 400,000) and years before today (to ~1950) on the x-axis. A horizontal line at approximately 280 ppm is labeled '1950 level'. The current level is shown as a sharp spike above this line, reaching over 400 ppm. A text box states: 'For centuries, atmospheric carbon dioxide had never been above this line.'

Figure 4. The NASA RETScreen® Award, Facility Owner and Operators Category



Service Providers & Facilitators Category



Service providers, including engineering, architecture, and consulting firms, as well as energy service companies, have increasingly embraced the RETScreen® Clean Energy Management Software and NASA POWER.

Government, multi-lateral organizations, and regulated electricity and natural gas utilities, also use RETScreen® software and POWER extensively to help facilitate clean energy project deployment and verify the ongoing performance of investment portfolios.

John Hayden, director of engineering at Quandel Energy Solutions Inc., presented on how his company uses RETScreen® for analyses.

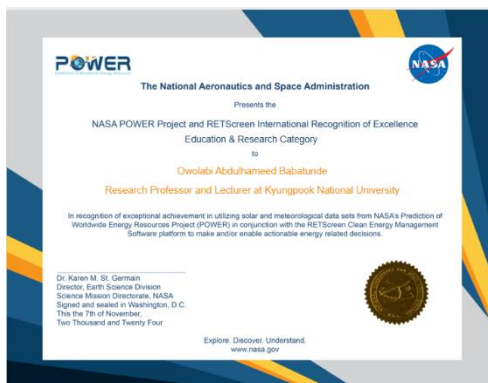
RETScreen—Fail-fast/What-if Modeling

- Build the model
 - Calibrate the model against normalized utility data and weather/solar data
- Include project costs and financial parameters
 - Provide the level of detail you have
 - HELP pages provide guidance when needed
- Start asking questions about project viability



Figure 5. The NASA RETScreen® Award, Service Providers and Facilitators Category

Educators & Researchers Category



More than 1,400 universities and colleges around the world use the RETScreen® Clean Energy Management Software and NASA POWER for teaching and research.

Thousands of students learn and subsequently use RETScreen® software and NASA POWER data every year. The RETScreen® software and NASA POWER data have been utilized in over 5,000 scholarly publications to date.

Owolabi Abdulhameed Babatunde, a professor and researcher at Kyungpook National University, presented "How RETScreen® Expert and NASA POWER Data Enhance My Work."

Building Energy Audit

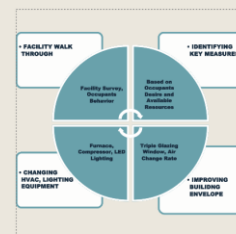


Figure 6. The NASA RETScreen® Award, Educators and Researchers Category



NASA RETScreen® Award Winner Biographies



Facility Owners & Operators Award

Cynthia Princiotta, Assistant Manager, Directorate of Portfolio Innovation, and Mats Striegler, Senior Advisor, Directorate of Portfolio Innovation



Cynthia and Mats spearheaded Canada's Department of National Defense (DND) deployment of RETScreen® software, which includes NASA POWER data. The DND's real property portfolio represents half of the government of Canada's portfolio and is comprised of over 8,000 buildings such as armories, warehouses, aircraft hangers, ship maintenance facilities, and mess halls. They leverage a network of over 25 sustainability managers located across the country and collaborate with the Environment and Climate Change group, Engineering and Architectural Standards group, and facility managers to implement the software.

RETScreen® is used to collect energy data from bases, perform analysis, benchmark, and identify portfolio elements that are most suitable for investment to reduce greenhouse gas emissions and move towards net zero. RETScreen® is also used to assess post implementation performance, including measurement and verification, and to inform future projects. Cynthia and Mats continue to provide insights and recommendations to support completing a 2050 carbon neutral portfolio plan in line with key strategic directions in the overarching national real property portfolio plan, the Treasury Board Secretariat Greening Government Strategy, and the investment plan to enable Canada's DND to progress towards net zero. One of the key products RETScreen® supports is the publication of DND's annual real property greenhouse gas emissions on



Service Providers & Facilitators Award

John Hayden, Director of Engineering, Quandel Energy Solutions

John develops energy savings projects for mostly Pennsylvania public schools. As the projects are implemented, existing buildings are renewed with lower carbon footprint systems while maintaining occupant comfort and lowering maintenance needs. As the projects are developed, each person who participates learns how to analyze, model, design, and specify the project. More experienced people mentor those with less experience. RETScreen® as an education and mentoring tool, provides a great starting point for exploration of possible solutions and helps develop what kinds of solutions make sense in which situations. Most of the projects have energy savings guarantees, so the energy modeling can be an important part of project development. Measurement and verification are part of every project that has a guaranteed energy savings.



Educators & Researchers Award

Owolabi Abudlhameed Babatunde, Research Professor and Lecturer, Kyungpook National University

Abdulhameed develops knowledge products with inputs for building energy efficiency performance analysis methodology using a modeling tool for school. He also develops technical notes documenting energy performance findings from residential and commercial buildings for clients. This is done after conducting energy surveys and audits. He also trains individuals and organizations in energy audits using RETScreen® energy analysis simulation software.

Figure 8. The NASA RETScreen® Award Winner Biographies



Feedback Session

A feedback session was convened on the second day of the GloCo. A virtual whiteboard platform, Mural, was utilized to facilitate discussion and gather feedback from 2024 GloCo attendees on POWER data, service, and tools. The virtual whiteboard was a preconfigured space with prompts, comment boxes, and open text areas.

Participants were encouraged to engage in conversation, share their experiences, and brainstorm new ideas. When asked why users chose to use POWER, most noted they like that POWER has global availability and a wide variety of data sources. Users also identified roadblocks when using POWER data and tools, such as a user who noted resolution and lag in data availability.

For future improvements, users had several suggestions. One such suggestion was for data relating to wind and temperature up to 500 meters. Other suggestions included creating short training programs covering some of POWER's tools and data products to reduce the need to email questions to the POWER team and developing more ArcGIS integration options.

See Appendix C for the full report.

Event Participation Statistics

The 2024 GloCo was announced through various NASA communication channels, including direct emails to POWER's users and those on the NASA GIS Community of Practice distribution list. Messaging was also shared across the Atmospheric Science Data Center, Langley Research Center, Langley Science Directorate, Applied Sciences, and Earthdata websites; the NASA ArcGIS Distributed Active Archive Centers Collaboration's group; and the Atmospheric Observation System and Earthdata X (formerly Twitter) and Facebook pages. Additionally, the [2024 GloCo Summit event webpage](#) was hosted on POWER's website.

Below is a summary of the statistics gathered related to event registrants and participants.



Figure 8. Registration Global Map

Users Registered: 305
Total Event Attendees: 101
Day 1 Attendees: 60
Day 2 Attendees: 77

Registrants reported from over 50 countries which is shown in Figure 10, with the most (over 75) from the United States. Canada and India reported the next highest number of registrants, with 26 and 20 respectively.

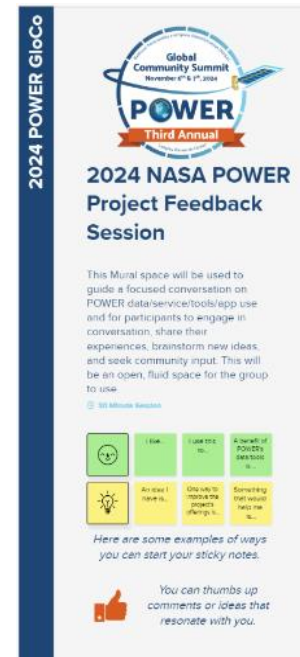


Figure 7. Instructions that Accompanied the User Feedback Mural Board



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The representation of registrants from different user communities is shown in Figure 11. Roughly 17% of registrants selected that they represent the agroclimatology community, 32% selected renewable energy, and 3% selected sustainable infrastructure. Over 40% of respondents indicated they identify with more than one community; this overlap underscores the cross-cutting nature of work done across these communities. The other category represents users that don't fall into the already distinguished communities, such as, wastewater treatment.

Registrants were asked if they were a user of POWER data, and, if so, how frequently, which is shown in Figure 12. 114 registrants noted that they had not yet used POWER data. The next most selected answer was "occasionally," with 112 responses.

Post-Event Feedback

To improve on future events, the POWER team collected feedback from summit registrants via email after the event. A summary of the responses can be found below. Details of all feedback collected can be found in Appendix D.

Of the six respondents that attended the event and responded to the survey, 100% rated the overall value of the content presented to be very valuable and responded that they would attend future GloCo Summits. Expert and student teacher presentations and agrivoltaics research was listed as the most valuable aspects of the event.

Over 80% of respondents noted that they are interested in presenting a lightning talk in the future and over 67% expressed interest in working with the POWER team to develop an impact story about their work.

For those who were not able to attend the event, they noted that "inconvenient time" and "unplanned activity came up" as the top two reasons they were not able to attend.

See Appendix D for the full feedback report.

Key Takeaways

The 2024 POWER GloCo Summit was the project's third virtual event. It provided an invaluable opportunity to interact with POWER's global end-users and stakeholder communities. Future meetings will continue to promote thought leadership

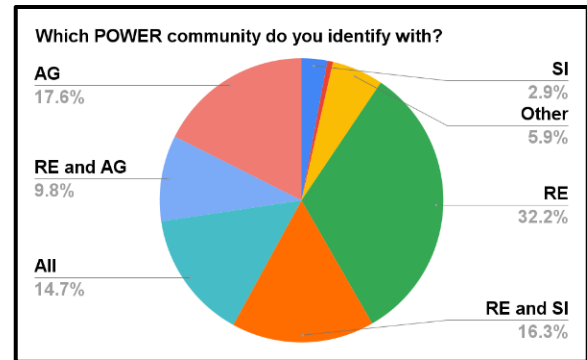


Figure 9. Communities Selected by Individuals Who Registered

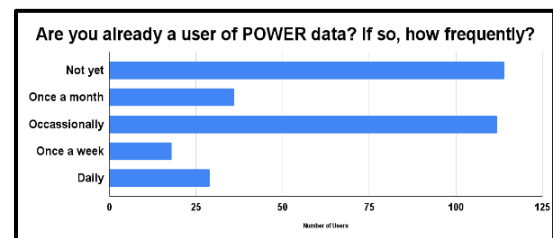


Figure 10. Responses to the Question Asking Registrants if They Are Already POWER Users

Would you be interested in presenting a lightning talk in the future?
7 responses

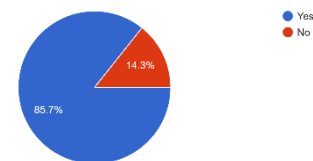


Figure 13. Question Asking Registrants if they would be interested presenting in the future

Would you be interested in participating in impact story development for the POWER Project?
7 responses

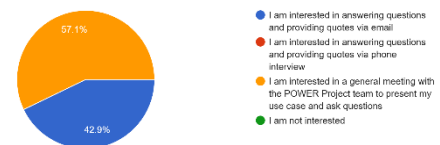


Figure 14. Question Asking Registrants if they would be interested impact story development.



and feature impactful use cases to benefit POWER's communities, who expressed keenness to participate in future GloCo Summits. The key takeaways from GloCo are:

- Users expressed their needs for parameters, such as wind at 150 meters and 500 meters to incorporate into their models and workflows, as well as an ask for atmospheric conditions at higher heights for taller buildings, especially for modeling climate change conditions. The need they provided feedback on is to expand upon already developed parameters.
- Across the data community, it was expressed that it is difficult to overcome the notion that ground data is more accurate than satellite. The resistance to change can stand as a roadblock to reaching new users but can serve as an opportunity for POWER to educate those through more community engagement on the topic.
- The lightning talks and feedback session allowed users to express how impactful the POWER Project was for their projects, companies, etc. A common theme was the desired features of POWER and why people chose it was due to its global availability and historical data.
- Users expressed interest and excitement about CASI and the future plans for climate predictions around certain sites. As this evolves, POWER will keep its user base informed. If public engagement about this topic is employed, it may result in new users leveraging data.

Acknowledgements

The POWER project is funded through the NASA Applied Sciences Program within the Earth Science Division of the Science Mission Directorate. The POWER team is assisted with technical and scientific inputs from the following Earth Science Division teams: The World Climate Research Programme Global Energy and Water Cycle Experiment's Surface Radiation Budget and the Clouds and the Earth's Radiant Energy System projects at NASA LaRC and the Global Modeling and Assimilation Office at the NASA Goddard Space Flight Center. The data obtained through the POWER web services was made possible with collaboration from the NASA LaRC Sciences Data Center.



Appendix A: Agenda

Day 1: Wednesday, November 6, 2024

TIME (EST)	SESSION
11:00 - 11:05 AM	Getting Started
11:05 - 11:20 AM	Welcome from NASA Earth Science Leadership
11:20 - 11:50 AM	POWER Overview, Journey, and Roadmap
11:50 - 12:15 PM	POWER Technical Showcase
12:15 - 12:45 PM	Keynote Speaker: Sustainable Buildings
12:45 - 1:00 PM	Break
1:00 - 1:40 PM	Community Showcase (Lightning Talks)
1:40 - 2:10 PM	Keynote Speaker: Current and Upcoming Data Products from NASA's Global Modeling and Assimilation Office
2:10 - 2:50 PM	Community Showcase (Lightning Talks)
2:50 - 3:00 PM	Closing Remarks

Day 2: Thursday, November 7, 2024

TIME (EST)	SESSION
11:00 - 11:05 AM	Getting Started
11:05 - 11:35 AM	Keynote Speaker: Solutions for the Build Environment
11:35 - 11:45 AM	RETScreen Overview
11:45 - 12:20 PM	NASA Recognition of Excellence Awards for RETScreen Expert Users
12:20 - 1:00 PM	Community Showcase (Lightning Talks)
1:00 - 1:15 PM	Break
1:15 - 1:45 PM	Keynote Speaker: Climate Modeling and Applications
1:45 - 2:15 PM	Community Showcase (Lightning Talks)
2:15 - 2:20 PM	Introduction to Feedback Session
2:20 - 2:55 PM	Feedback Session
2:55 - 3:00 PM	Closing Remarks



Appendix B: Lightning Talk Speaker List

Day 1, Session 1

NOVEMBER 6, 2024 1:00-1:40 PM	COMMUNITY
"Predictive Maintenance of Solar Photovoltaic Microgrid System" by Saravanan Vasudevan, Arunai Engineering College	Renewable Energy
"How NASA POWER Aids Alpha 311's Customer Journey" by Barry Thompson, Alpha 311	Renewable Energy
"The Impact of Climate Change on Power Systems: Predicting Surface Pressure with Machine Learning" by Siraj Mohammed, Southern Illinois University	Renewable Energy
"DAV" by Mohammedreha Abafogi, Jimma University	Renewable Energy

Day 1, Session 2

NOVEMBER 6, 2024 2:10-2:50 PM	COMMUNITY
"Design Calculation for Solar Sludge Drying" by André Großer, Huber SE	Sustainable Infrastructure
"NASA's Renewable Energy/ POWER Data: Shaping My Solar Energy Research" by Dr. Jyotsna Singh, University of Arizona	Renewable Energy
"Neural Network Multifactor Computational Models for Forecasting Solar Power Plant Output" by Victor Abrukov and Darya Anufrieva, ChuvSUV	Renewable Energy

Day 2, Session 3

NOVEMBER 7, 2024 12:20-1:00 PM	COMMUNITY
"Wind Energy and Power System Modelling User Requirements" by Rémi Gandoin, C2Wind	Renewable Energy
"Modeling the Agrivoltaics Microclimate" by Richmond Kuleape, University of Freiburg	Renewable Energy, Agroclimatology
"Solar Power Sizing Made Easy" by Kenneth Muturi, Davis and Shirtliff	Renewable Energy

Day 2, Session 4

NOVEMBER 7, 2024 1:45-2:15 PM	COMMUNITY
"Enhancing Food Security with Crop Simulation Models" by Mariano Tamburrino, YielData	Agroclimatology
"Power System Resilience and Climate Change Mitigation in the Nzoia River Basin" by Stephen Mureithi Kivuti, Moi University	Sustainable Infrastructure, Agroclimatology



Appendix C: Feedback Session Report-out

A feedback session was convened on the second day of the summit. A virtual whiteboard platform, Mural, was utilized to facilitate discussion and gather feedback from 2024 GloCo attendees. Inputs and feedback received from the participants at each breakout session are presented below. A summary of the inputs obtained in the breakout sessions, can be found in Section 5 of the report.

Current Capabilities/Use

Q1: Why did you choose to use POWER?

A1: Availability and the fact that there is a wide variety of data sources.

A2: Global coverage all key parameters.

A3: Long-term historical data, solar and met data, good resolution, global coverage, easily accessible, excited about MERRA-3.

Q2: How is POWER data used in your current workflows? (Data/parameters, data services/formats, and analytic capabilities)

A1: Solar and met data, historical and current data.

A2: Mainly used as a source of data.

A3: Couple clicks of a mouse and data available to user in RETScreen.

Q3: What are the main roadblocks to using POWER within your community?

A1: User perception of accuracy of data vs. ground measurements - i.e., users can assume by default that satellite data is less accurate.

A2: Resistance to change within the community. People still want to rely on traditional data sources (ground measurements).

A3: Sometimes resolution is an issue and lag in data availability.

Desired Future Enhancements

Q4: What are your future needs in terms of data, capabilities, or services data/parameters, data services/formats, and analytic capabilities?

A1: From lighting talk: 10 and near hub height (100-150m) winds.

A2: Hearing the need for daily projected future data products including T, P and solar irradiance.

A3: Wind and other parameters at different heights like 100M, 500M, etc.

A4: Humidity and heat index, projections in the POWER DAV (CASI).

A5: Evaluate need/usefulness of TMY/fTMY generator tool.

A6: Need for higher spatial resolution.

A7: As discussed prior, projected values to 2100 for entire surface of planet.

A8: Requirement higher spatial resolution data, conduct short live training programs related to data products, and applications, add some parameters related to vegetation, as I remember we have TPAR, DPAR from there one can calculate GPP but if you have any products related to that already then its fine.

Q5: What tools and/or technology do you foresee needing to integrate with? (e.g.: TensorFlow for ML, interactive validation like the PRUVE tool)

A1: Potential tool for window slider to assess extremes in time series data.

A2: Develop a ChatGPT like interface that works with the DAV.

A3: More ArcGIS integration options. Is it possible to get some parameters at hourly and daily levels?



A4: Advanced Data Analytics and AI IOT.

Community Impact

Q6: Have you been able to use POWER data for informing policy or decision-making? If so, what was the impact? (e.g., "We been using POWER data/tools and we've saved X amount of energy.")

A1: RETScreen presented earlier - Just two examples of users - DND and 8,000+ buildings and Pennsylvania ESCO - \$500M in projects for just one firm. 850,000+ users, for RETScreen (and by extension NASA POWER data), so global impact is huge.

A2: Previous impact study on RETScreen (including NASA data) estimated \$20B in direct user cost savings, more than \$100B in project investments, 50 MT/year CO2 reductions.

A3: Yes, for South Africa, Solar Resource assessment report/bankable solar report, developing site specific products etc.

Q7: Have you created any value-added data or tools that utilize POWER data/services? If so, how are the users of your tool employing POWER data in their work?

A1: www.retscreen.net

A2: SolarCalc

A3: Currently busy with Solar radiation forecasting project using ML and displaying it on the dashboard built in python.



Appendix D: Post-Summit Feedback

After the GloCo summit, a survey was circulated to POWER's user community to receive feedback on the attendee's experience, expectations regarding such future events and to collect feedback on data, web services and other needs from non-attendee users.

For Those Who Did Attend

Q1: What POWER capabilities/parameters are used in your current workflows?

A1: Single point

A2: Meteorological data

A3: Data Access Viewer

A4: Weather conditions and solar radiation data

A5: Global solar parameters mainly direct normal and diffuse, occasionally cloud cover.

A6: I used renewable energy with weather parameters

Q2: What are your future needs in terms of data capabilities, services, and parameters?

A1: Single point, daily data

A2: Expanded cloud and climate data

A3: Detailed cloud dynamics, including cloud fraction, cloud type, and their effects on energy and agricultural models.

A4: Solar insolation, DNI at ground level, temperature

A5: Data on average daily meteorological conditions and solar radiation

A6: Future data, finer resolution

A7: To use different regions to account for varying climate patterns.

Q3: How would you rate the overall value of the content presented?

100% responded "very valuable."

How would you rate the overall value of the content presented?

7 responses



Q4: What did you find most valuable?

A1: Daily with seasonal data

A2: The presentations part from student teachers

A3: Expert's presentation

A4: Weather conditions and solar radiation data

A5: Agrivoltaics research

A6: The POWER database, as well as all the topics discussed in the 2024 annual NASA POWER Global Community



Q5: How would you rate the duration of the event?

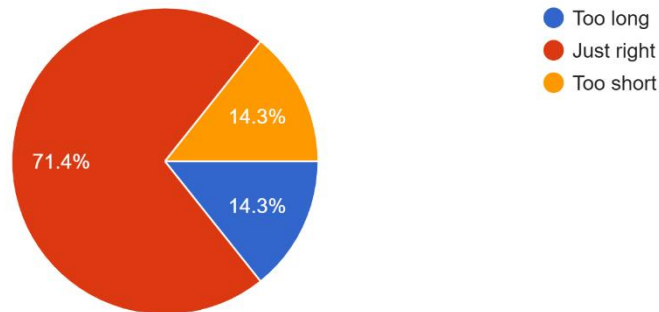
66.7% responded "just right."

16.7% responded "too long."

16.7% responded "too short."

How would you rate the duration of the event?

7 responses



Q6: How would you rate the use of the MURAL board for the feedback session?

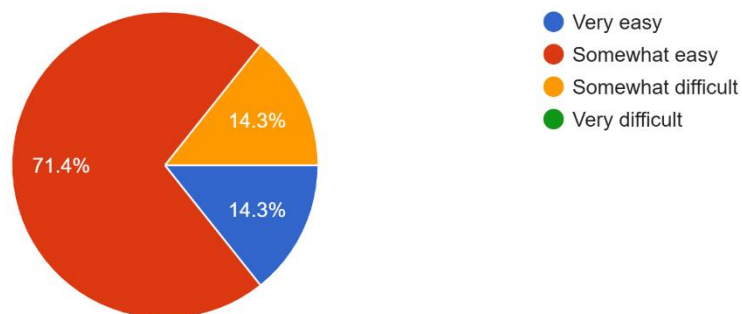
66.7% responded "somewhat easy."

16.7% responded "somewhat difficult."

16.7% responded "very easy."

How would you rate the use of the MURAL board for the feedback session?

7 responses



Q7: Would you be interested in a future GloCo event?

85.7%% responded "absolutely, count me in."

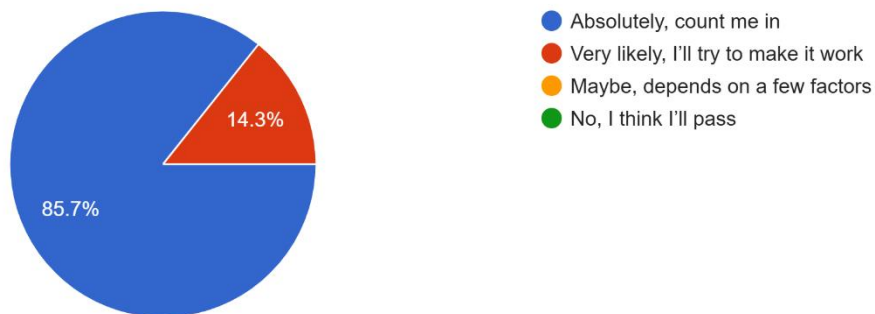
14.3% responded "very likely, I'll try to make it work"



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Would you be interested in a future GloCo event?

7 responses



Q8: Which timeslot(s) would you prefer for a future GloCo event?

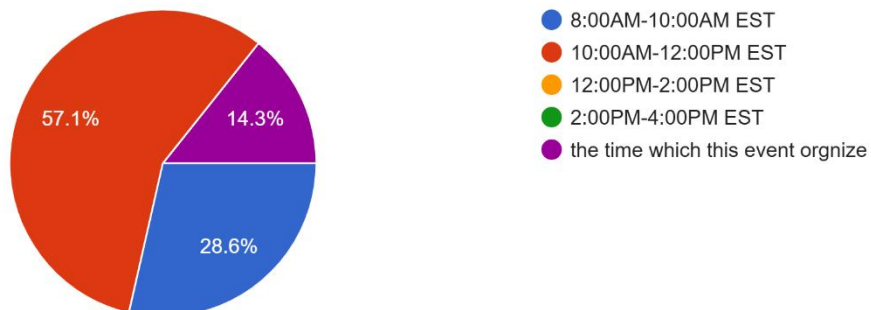
57.1.% responded "10AM-12PM."

28.6% responded "8-10AM."

14.3% responded "the time which this event organized."

Which timeslot(s) would you prefer for a future GloCo event?

7 responses



Q9: Would you be interested in presenting a lightning talk in the future?

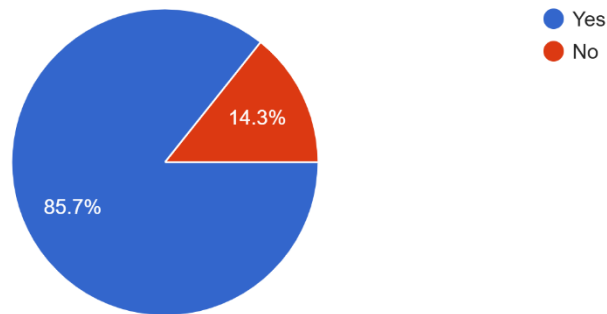
85.7% responded "yes."

14.3% responded "no."



Would you be interested in presenting a lightning talk in the future?

7 responses



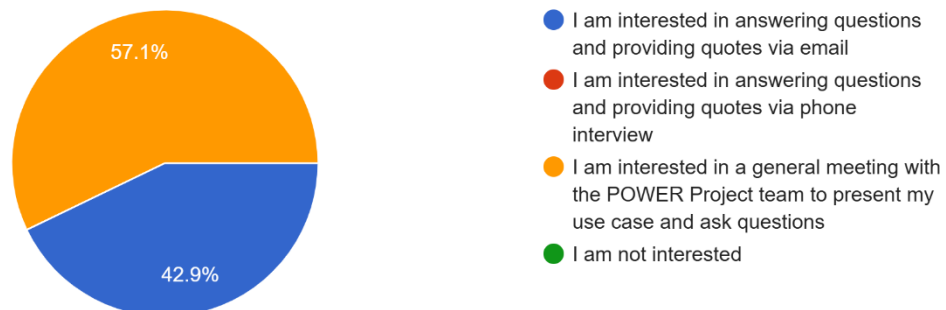
Q10: Would you be interested in participating in impact story development for the POWER project?

57.1% responded "I am interested in a general meeting with the POWER project team to present my use case and ask questions."

42.9% responded "I am interested in answering questions and providing quotes via email."

Would you be interested in participating in impact story development for the POWER Project?

7 responses



Q11: Suggestions for future improvement:

A1: NASA data integrations with other

A2: Could you create a telegram chat (group)?

A3: Lightning talks to be at least 10 minutes

For Users Who Did Not Attend

Q1: What POWER capabilities/parameters are used in your current workflows?

A1: Primarily the MERRA set

A2: Weather solar radiation

A3: Looking to use API to pull 8760 hourly weather data for objective energy models (OpenBuilding.ca)

A4: Single point

A5: Solar irradiance and insolation index



- A6: Temperature, precipitations, insulation
- A7: Precipitation and temperature
- A8: Rain/solar radiation
- A9: Tilted vale of solar irradiance

Q2: What are your future needs in terms of data capabilities, services, and parameters?

- A1: Any meteorological data
- A2: We are very satisfied with all information
- A3: Easy access via API to weather data formatted like TMY, but for recent year ranges (as alternative/check to terrestrial data). We use 24hrs as mean for daily HDD/CDD, NOT MAX-Min which gives lower-resolution HDD/CDD values. Binning this into monthly summaries would be helpful in your UI, but only if HDD/CDD values are 'properly' defined w 24hrs/day in the calculation.
- A4: Seasonal data
- A5: Spectral irradiance instead of just total, can select the area coverage of the location
- A6: Access to updated precipitation and temperature data
- A7: Its okay what SI currently provided
- A8: Stat using the API

Q3: What were the primary reasons you couldn't attend?

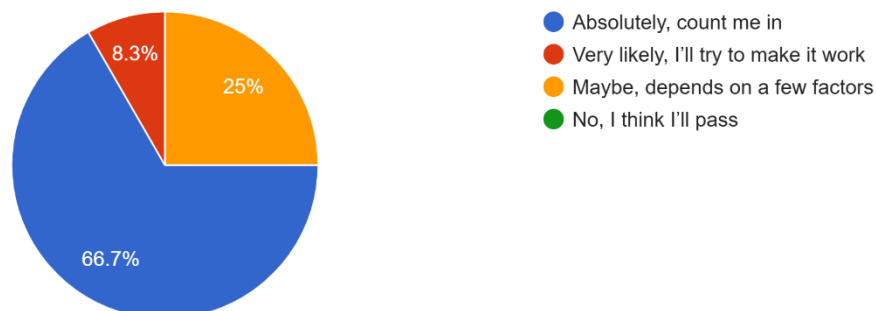
- 33.3% responded "unplanned conflict."
- 16.6% mentioned inconvenient time.
- 8.3% responded "did not receive the invite."
- 8.3% mentioned the lack of translation into other languages.
- 8.3% mentioned connectivity issues.

Q4: Would you be interested in a future GloCo event?

- 66.7% responded "absolutely, count me in."
- 25% responded "maybe, depends on a few factors."
- 8.3% responded "very likely, I'll try to make it work."

Would you be interested in a future GloCo event?

12 responses



Q5: Which timeslot(s) would you prefer for a future GloCo event?

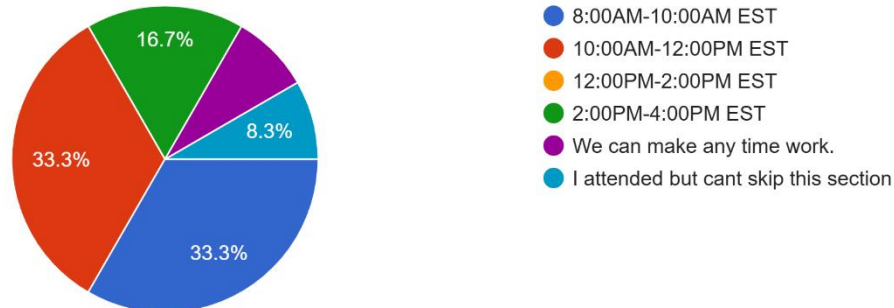
- 33.3% responded "8-10AM."
- 33.3% responded "10AM-12PM."
- 16.7% responded "2-4PM."



8.3% responded "we can make any time work."

Which timeslot(s) would you prefer for a future GloCo event?

12 responses



Q6: Would you be interested in participating in impact story development for the POWER Project?

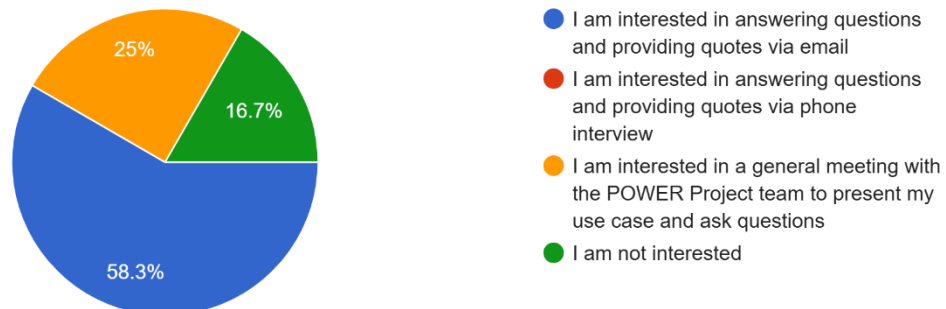
58.3% responded "I am interested in answering questions and providing quotes via email."

25% responded "I am interested in a general meeting with the POWER project team to present my use case and ask questions."

16.7% responded, "I am not interested."

Would you be interested in participating in impact story development for the POWER Project?

12 responses



Q7: Suggestions for future improvement:

A1: Will have more questions as we move from our static modeler to a dynamic modeler, but generally, verification/comparison/review of our Table C2 (2025 National Building Code of Canada)'s weather data table would be useful.

A2: data quality

A3: spectral irradiance instead of just total, can select the area coverage of the location

A4: All looks great! Thanks and keep it up

A5: Keep on going