

Open Energy Dashboard

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ABSTRACT

The Open Energy Dashboard (OED) is a free, open source project that provides a web-based application to display energy information in a web browser. It was designed from the ground up to be portable so that it can be used at many organizations.



OBJECTIVES

OED was founded under the belief that sharing and working together will advance our common goals. Instead of producing another energy dashboard targeting a single organization, we decided to make a dashboard that would be usable and valuable to a wide range of organizations. We pursued this path because the existing dashboards we found were not portable, had limited functionality or were not free. OED is driven by the needs of its end users where our goal is to take care of the underlying technologies so you can more easily do your important work. OED is an open project that accepts ideas and contributions from everyone. We are pleased to partner with others to achieve a result that benefit both you and others.

The OED project has two primary missions:

- 1.The first is what most people think of as the mission of OED: To produce a high-quality, free dashboard in support of sustainability and to address climate change. This is what is discussed above.
- 2.The second is to be what a group working in this area (including the OED project maintainer) has coined as Education-Oriented HFOSS (Humanitarian and Free Open Source Software) projects. This means that working with students to give them a high-quality, mentored experience is central to OED. This allows students to gain real-world experiences, enhance their education and prepare for a career after graduation while making a concrete difference in the world via their contributions to OED. OED strives to work with all interested students to give as many as possible this rich experience. We understand that our focus requires project resources, but know it is a valuable investment. Furthermore, the OED maintainer is committed to working with students who are AHN (African Americans/Blacks, Hispanic/Latino(a), and Native Americans/Alaskan Natives) and first-generation in computer science education. To meet this objective, we work with colleges, universities and organizations that serve these populations (sometimes known as MSI or Minority Serving Institutions). In fact, from Spring 2022 through Summer 2023 (latest data when this was last updated), 68% of the 60 students who worked on OED came from MSIs. OED does not ask demographic information of our student developers, so we cannot state the actual percent of students of different backgrounds. However, the pool clearly indicates a strong presence of AHN and first-generation students while still accepting interested students from other types of institutions.

TECH STACK

Overview:

This open source project was developed using a combination of modern technologies, collaborative tools, and innovative methodologies, reflecting the dynamic and versatile nature of open source software development.

Development Tools and Technologies:

Programming Languages: The project primarily utilizes JavaScript and TypeScript, chosen for their flexibility, wide community support and valuable documentation.

Frameworks and Libraries: We leveraged React, Node.js, Plotly.js to streamline development and enhance functionality.

Database Management: The project employs PostgreSQL and Docker to manage and store data efficiently.

Version Control: Git, along with GitHub, facilitated version control and collaborative coding, allowing contributors to seamlessly merge code and maintain the project's integrity.

Development Methodology:

Code Reviews: Regular code reviews were conducted to ensure code quality, consistency, and adherence to best practices.

Issue Tracking and Project Management: Tools such as GitHub Issues were used for tracking issues, managing tasks, and coordinating development efforts.

Community Discussions: Platforms like Discord facilitated communication, brainstorming, and support among the community members.

Documentation: Comprehensive documentation was maintained to guide users and developers, using platforms GitHub Wiki and the Website.

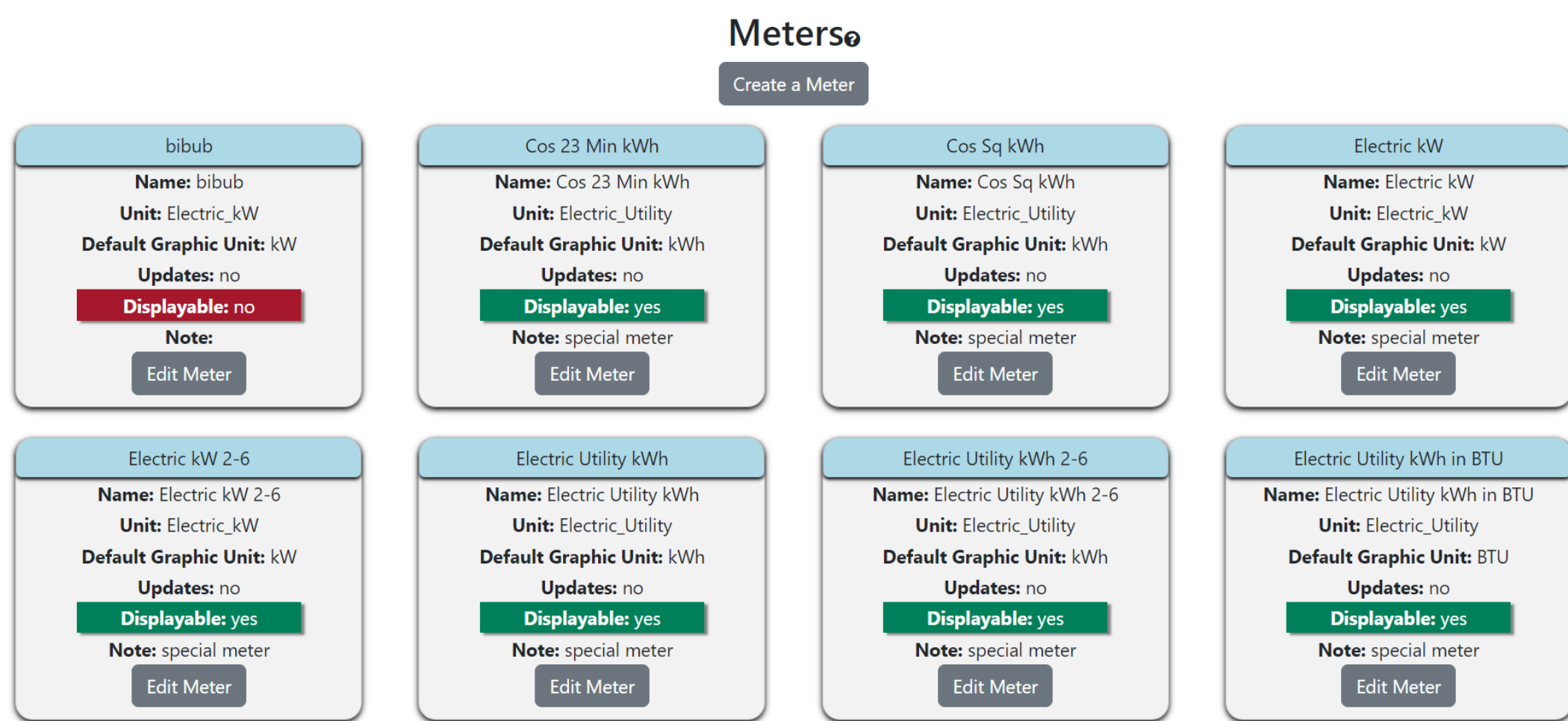
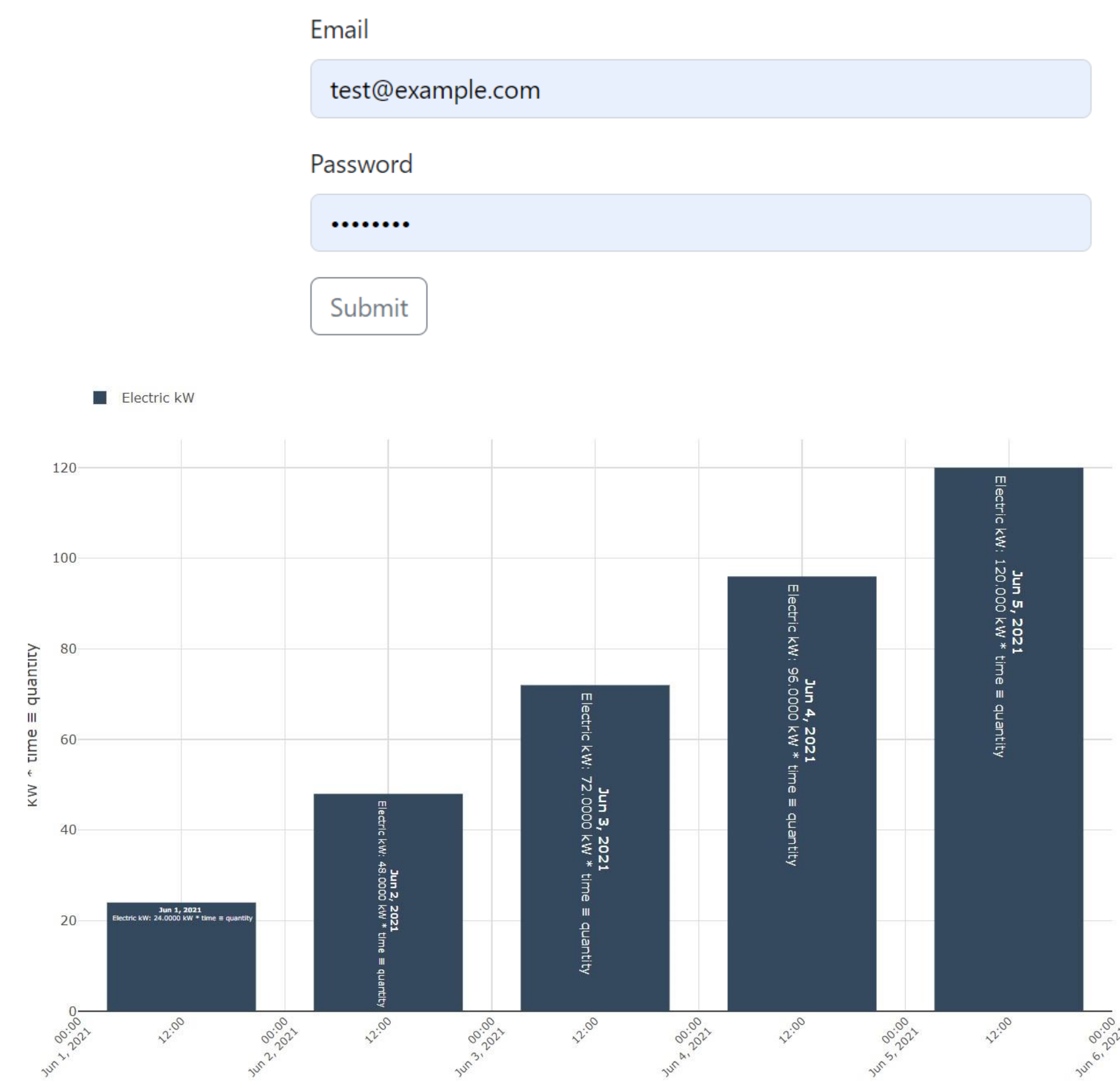
Testing and Quality Assurance:

User Testing: Regular user testing sessions were conducted to gather feedback and iteratively improve the user experience.

RESULTS

- Evaluating the dashboard during its development. This would mean early access to features for your comment. This can be by looking at our development system or plans/mockups of new ideas.
- Providing feedback on proposed designs for the dashboard including graphics, data stored, admin features, etc.
- Involved in the development of the dashboard. This could be anything from coding to language translation.

- OED is an educationally-based open source project. As such, we view working with and advancing the learning and career goals of students as a core part of the project. As of the end of summer 2023, 60 people had made non-trivial contributions to the OED project (100 or more line of additions/subtractions according to GitHub). (13 have changed more than 10,000 lines and 21 have changed 1,000-10,000 lines) Note that since a number of students work in teams this is a lower bound estimate on the number of students who have worked significantly with OED. A total of 90 people have contributed to the project. OED has been expanding the number of students and institutions it works with and welcomes new collaborations. During the 2022-23 academic year (Fall 2022 - Summer 2023), OED had 60 total students. We are continuing our substantial help and mentoring even when we have a significant number of students. There are a number of ways that students have engaged with the OED project:



CONCLUSIONS

OED depends on the freely given contributions from several groups. The primary one is those that develop the code base. These have mostly been students who do it because they believe in our humanitarian efforts for sustainability and also to get a valuable experience by working with a real project. The other large group is all actual or potential users of the dashboard. These include sustainability people, users of the dashboard, energy managers, etc. They provide direction for the features OED provides and feedback on both early version of features as well as on the production version of OED. The OED project has found that our mission and principles resonate with all these people and they are willing to generously give their time for the common good. While each person might have a certain area or interest in the dashboard, they collectively move the project forward as a whole. The end result is a high-quality, free energy dashboard that informs people about usage while also freeing up time and money to support other initiatives in sustainability. The OED project has found this model to be viable and strongly believes it will continue into the future, esp. as more people use OED.

REFERENCES

This section acknowledges the scholarly and technical works that have informed and supported the development of this project. Each reference is a testament to the collaborative nature of knowledge and the importance of building upon existing work.

1. <https://openenergydashboard.github.io/index.html>
2. <https://github.com/OpenEnergyDashboard/OED>

This list is not exhaustive but represents key resources that have significantly contributed to the conceptualization and realization of our project. We extend our gratitude to the authors and creators of these works for their valuable contributions to the field of open source development.

Create a Unit

Identifier:

Name:

Type of Unit:

Unit Represent:

Displayable:

Sec in Rate:

Note:

Discard Changes Save

ACKNOWLEDGEMENTS

This project is a testament to the collaborative spirit of the open source community, and I extend my deepest gratitude to all those who have contributed their time, expertise, and resources to make this endeavor a success.

Special Thanks:

•**Community Contributors:** A heartfelt thank you to the myriad of developers, testers, and users from around the globe who have contributed code, reported bugs, and provided valuable feedback. Your contributions have been instrumental in enhancing the functionality and reliability of this project.

•**Project Mentors and Advisors:** I am immensely grateful for the guidance and support provided by Huss-Lederman and Wes Turner, whose insights and expertise have been invaluable in shaping the direction and execution of this project.

•**Open Source Community:** A special acknowledgement to the wider open source community for providing an environment of collaboration, learning, and growth. The tools, libraries, and frameworks developed and shared by this community have been crucial in the development of this project.

This project stands as a collective achievement, and it is with profound respect and gratitude that I acknowledge the contributions of each individual and organization involved. Together, we are pushing the boundaries of what is possible through open collaboration and shared knowledge.