



# Forecast Arbiter and Open-Source Development

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# Forecast Arbiter is the result of many folks



Will Holmgren



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Leland Boeman



Cliff Hansen



Justin Sharp



Aidan Tuohy



David Larson

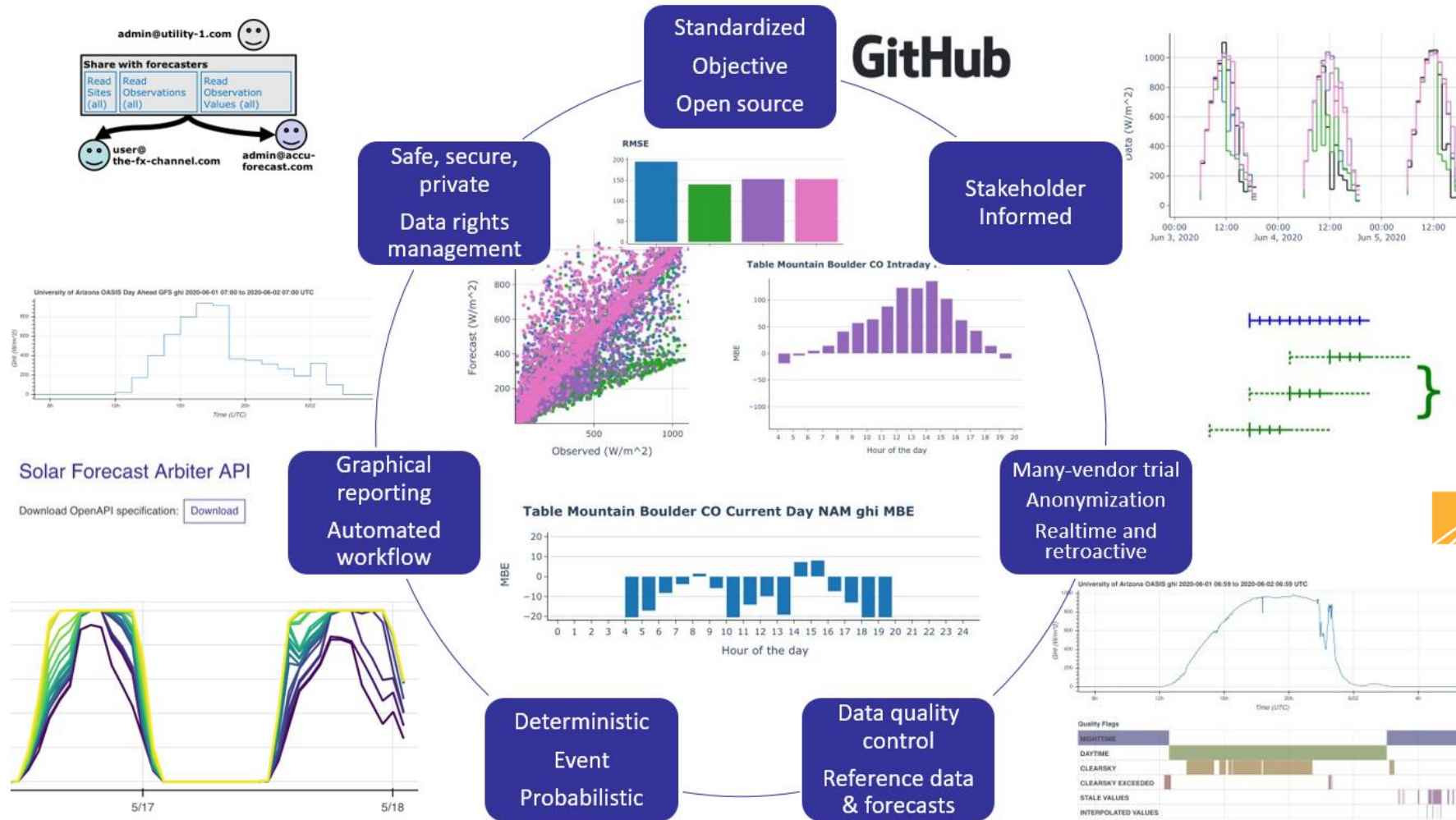


Adam Wigington

University of Arizona  
EPRI  
Sandia National Labs  
Sharply Focused



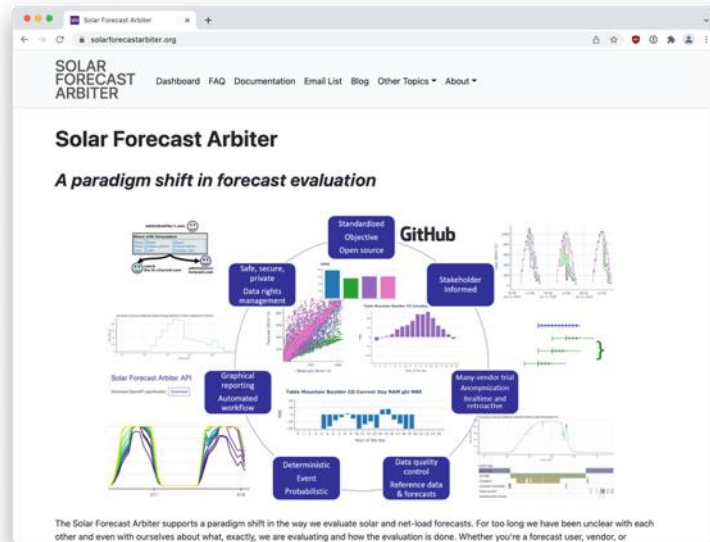
# Forecast Arbiter (aka Solar Forecast Arbiter)



**Clear, transparent forecast evaluation tool**

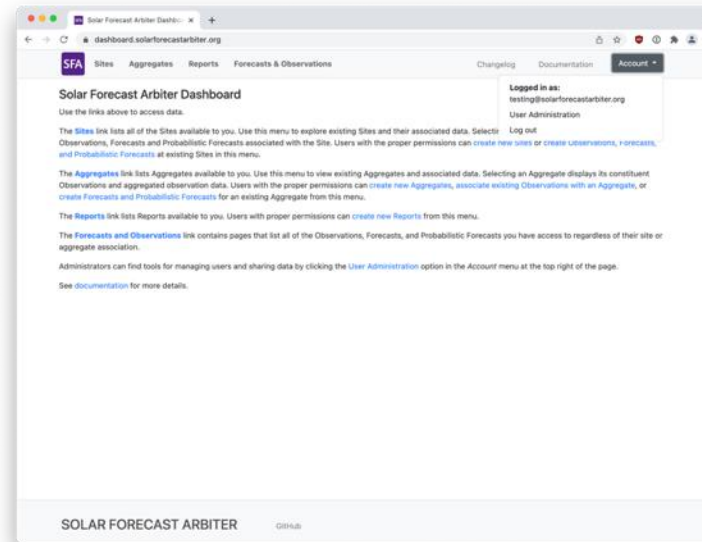
# Forecast Arbiter consists of 3 components:

(1) Info site



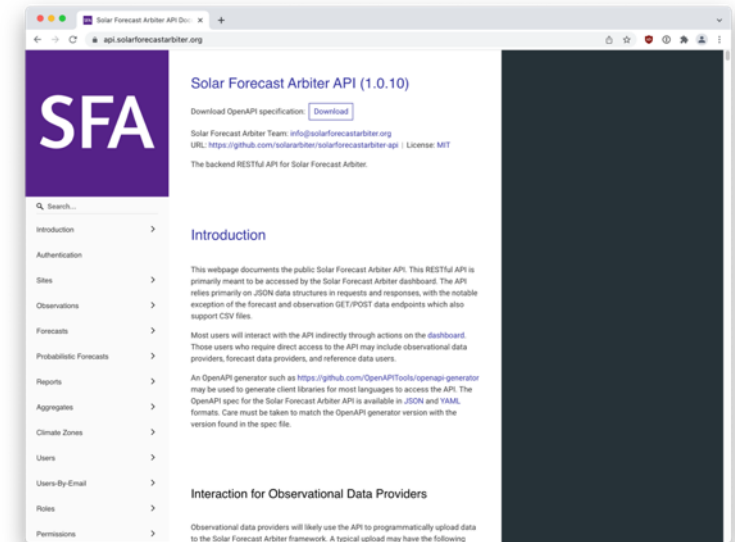
Documentation, guides, etc.  
(publicly available)

(2) Dashboard



Web interface  
(secure access)

(3) API



Programmatic interface  
(secure access)

<https://forecastarbiter.epri.com>

# Why use the Forecast Arbiter?

- standardized process to **evaluate forecast performance**
- anonymized, multi-vendor **forecast trial** capability
- **track forecast accuracy** over time and locations
- **automated reports** with wide range of error metrics
- support for both **deterministic and probabilistic forecasts**
- **benchmark forecasts and reference data** for 200+ sites already included
- **share forecast performance** across users (bulk summary metrics in anonymized or detailed reports)
- upcoming support for **wind power and load forecasts**

...and many more features!

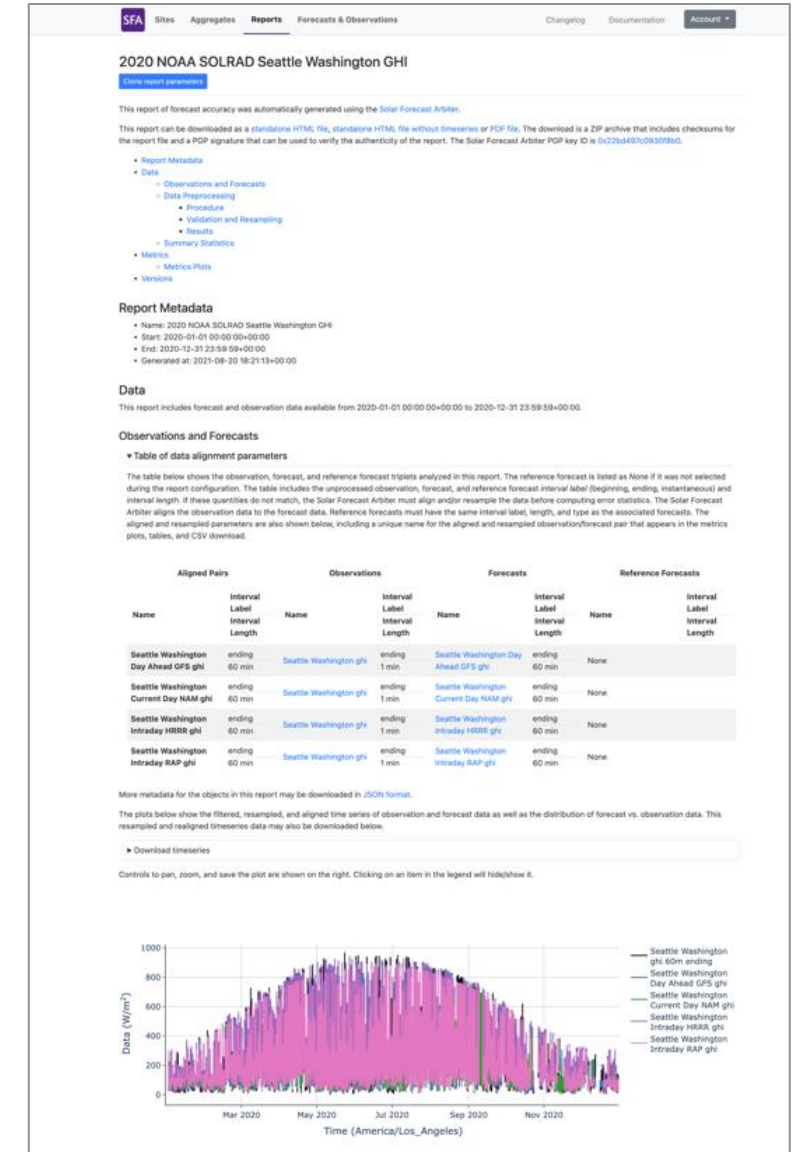
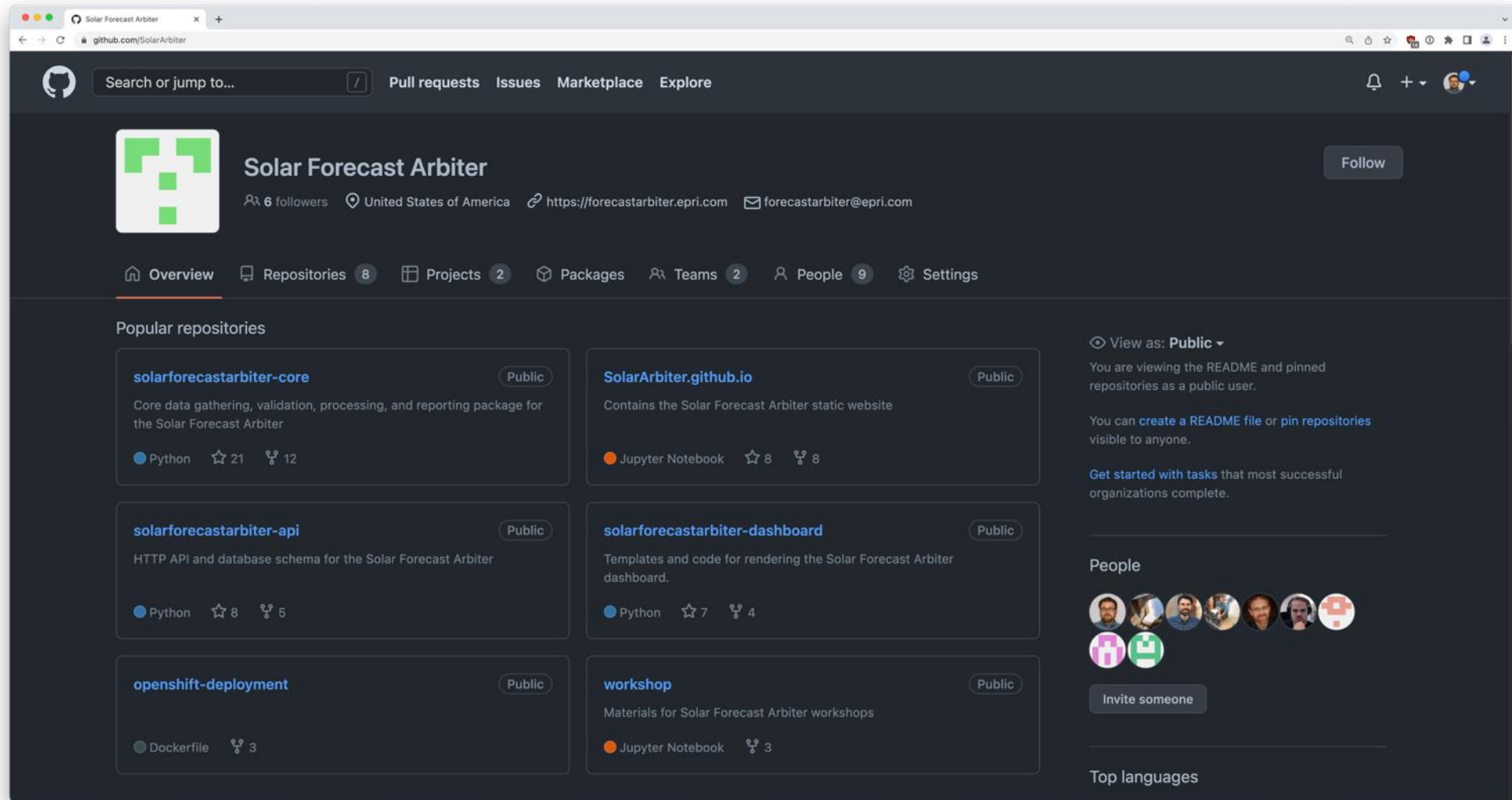


Figure: Screenshot of sample report.

# Open-source development from the start (Jan. 2019)



[https://github.com/Solar Arbiter](https://github.com/SolarArbiter)

# Thoughts on open-source software



People



Tools



Sustainability

# Examples of EPRI open-source software

## OpenDSS

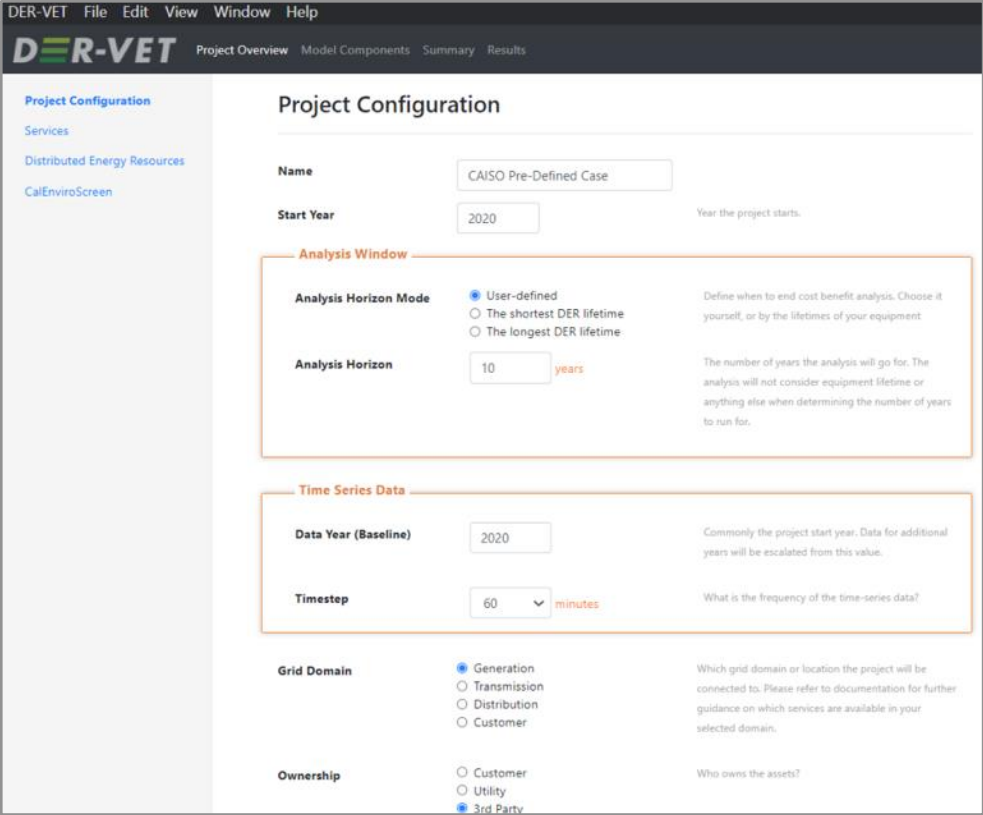
(distribution system simulator)



<https://www.epri.com/pages/sa/opendss>

## DER-VET

(energy valuation and planning tool for DERs)



<https://www.der-vet.com/>



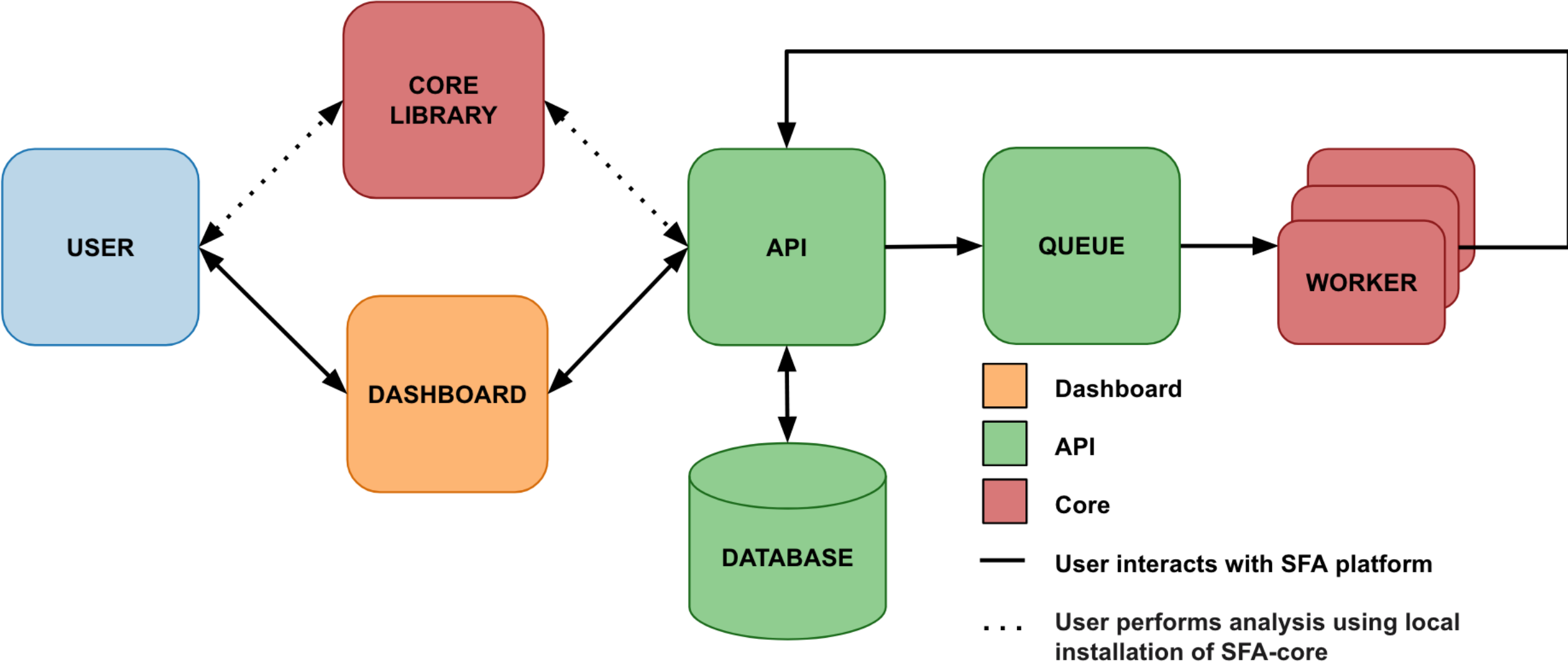
# Closing thoughts on open-source software

- **Using** open-source software
- **Developing** open-source software
- **Supporting** open-source software

A blue-tinted photograph of four people standing in a row. From left to right: a man with curly hair and glasses wearing a white lab coat; a man with glasses wearing a white lab coat; a woman wearing a white hard hat and a dark polo shirt; and a man with glasses and a beard wearing a light-colored button-down shirt. The text "Together...Shaping the Future of Energy™" is overlaid in white in the center.

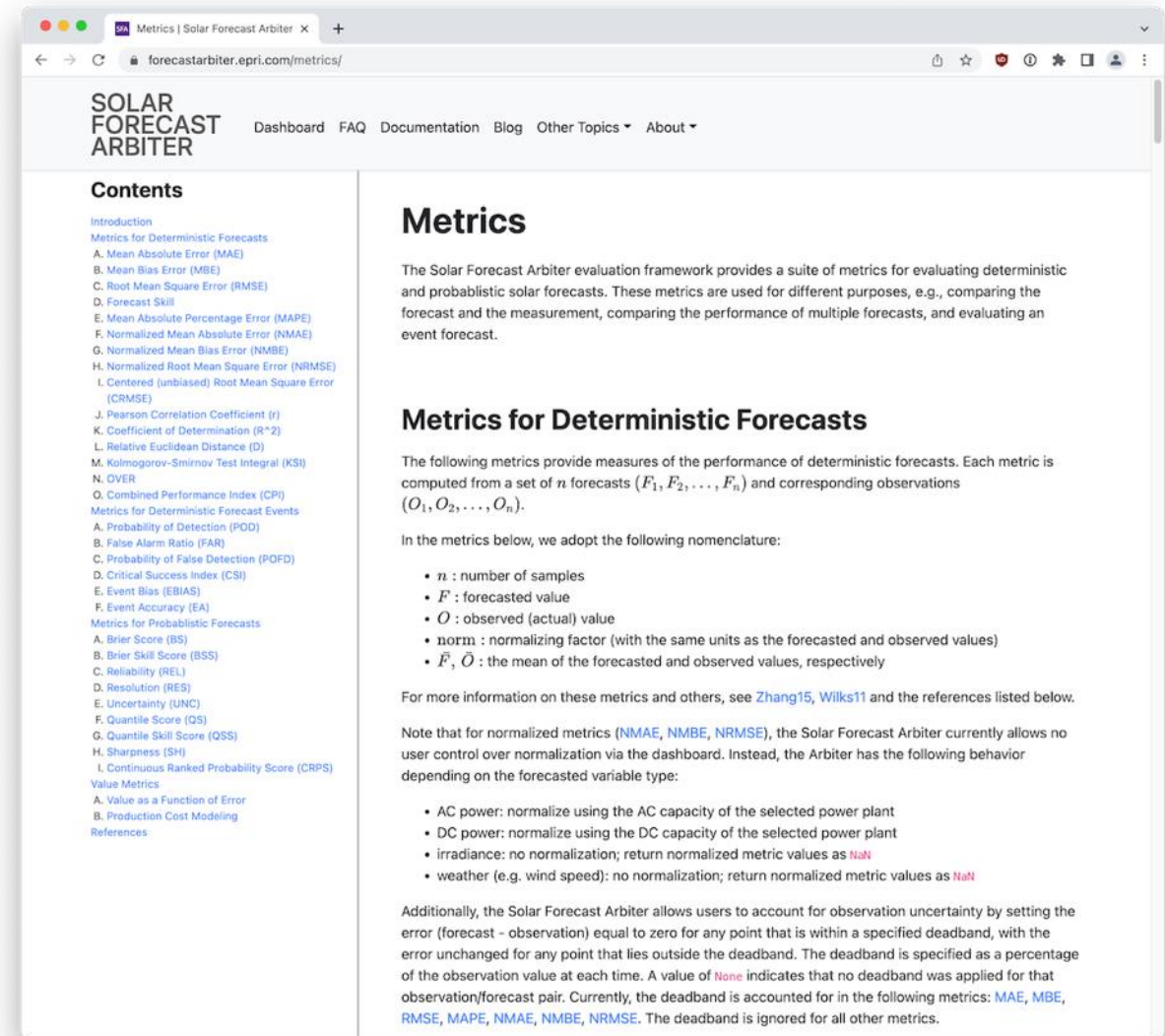
Together...Shaping the Future of Energy™

# Forecast Arbiter: Software Architecture



# Forecast Error Metrics

- Deterministic forecasts:
  - Mean Absolute Percentage Error (MAPE)
  - Root Mean Square Error (RMSE)
  - Mean Bias Error (MBE)
  - ...
- Probabilistic forecasts:
  - Brier score
  - Continuous Ranked Probability Score (CRPS)
  - ...



<https://forecastarbiter.epri.com/metrics/>