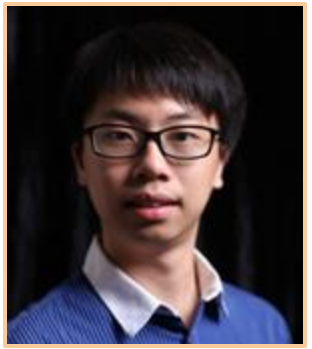


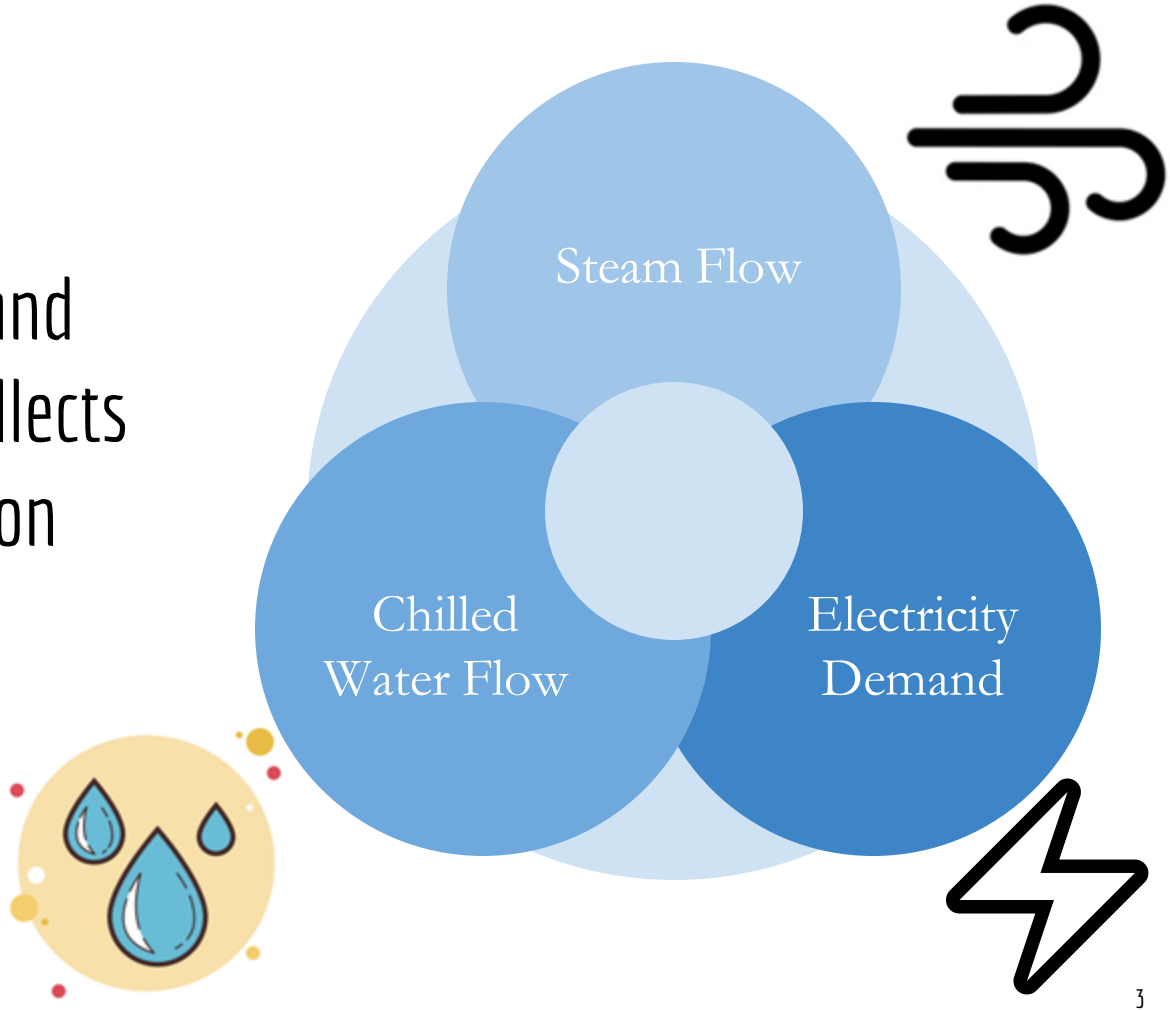
# EMCS Consumer Insights Team

Owen Deng, Jennifer Tieu, Ishneet Sachar, John Lee

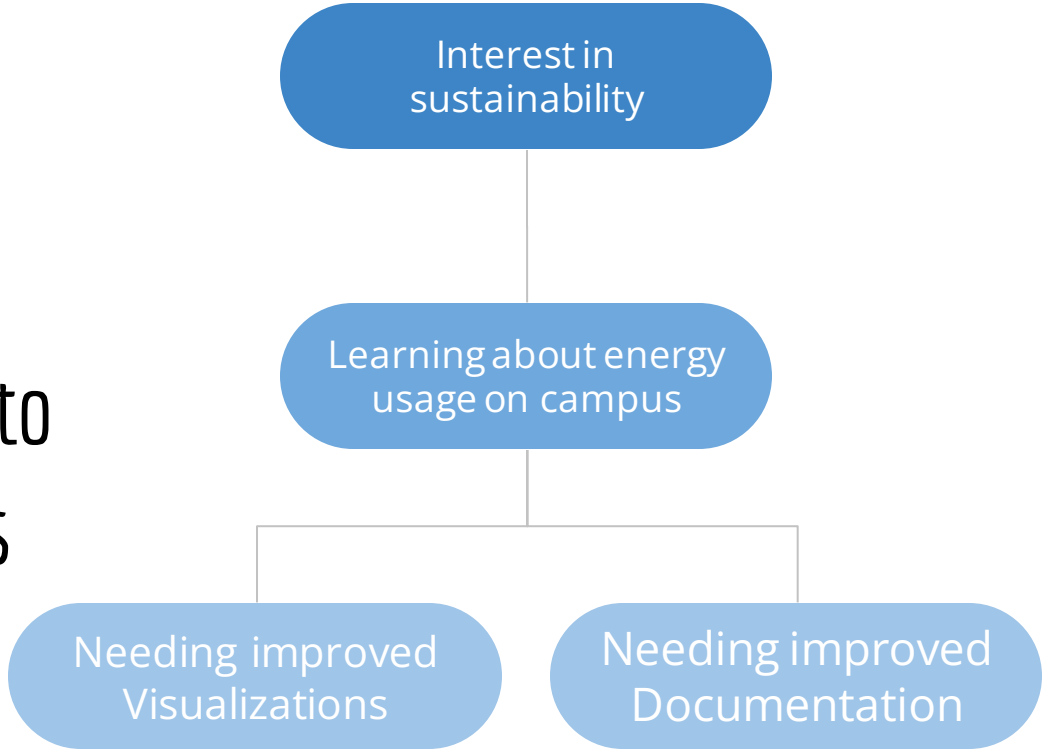
Thank you to Dr. Hutchison, the EMCS team (Steve), and our classmates in assisting us at various stages of this project so we are able to provide an engaging platform for students and the general public to learn about energy use on Cornell campus.

Here is our EMCS dashboard

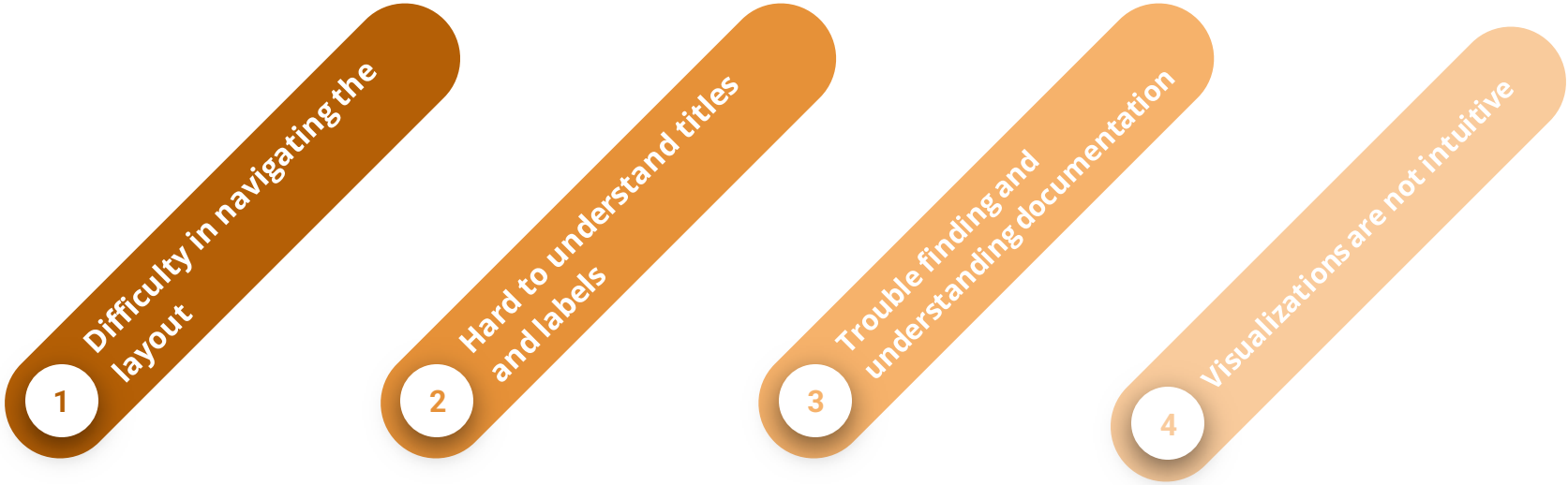
The Energy Management and Control System (EMCS) collects energy consumption data on campus in real time.



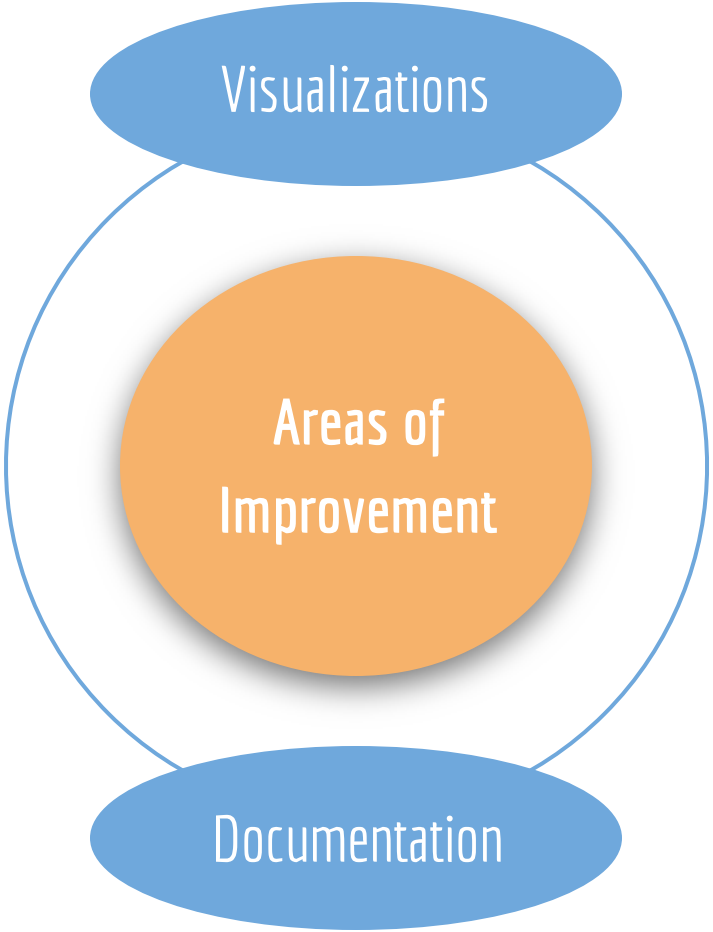
Our team's interest in sustainability leads to a deeper improvement in providing ease of access to energy data to our peers

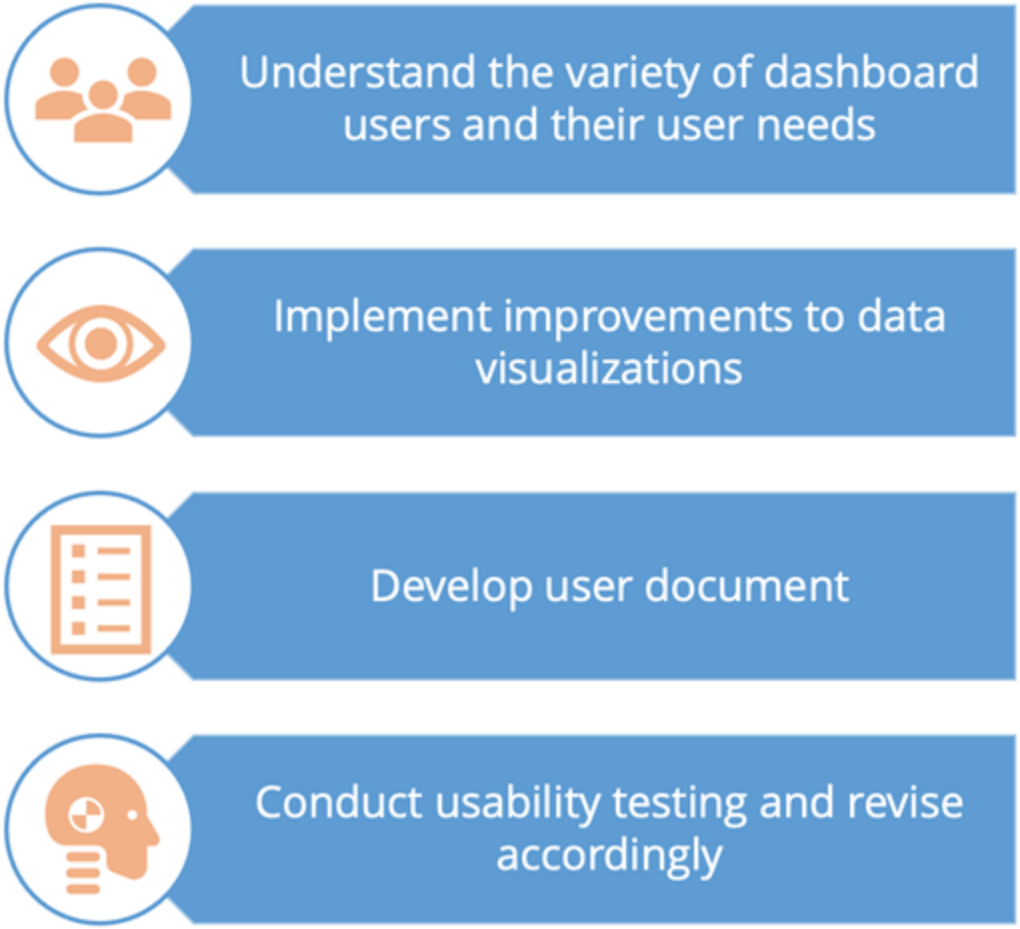


# The previous EMCS Dashboard was not user friendly and hard to navigate



We wanted to address two main areas of improvement



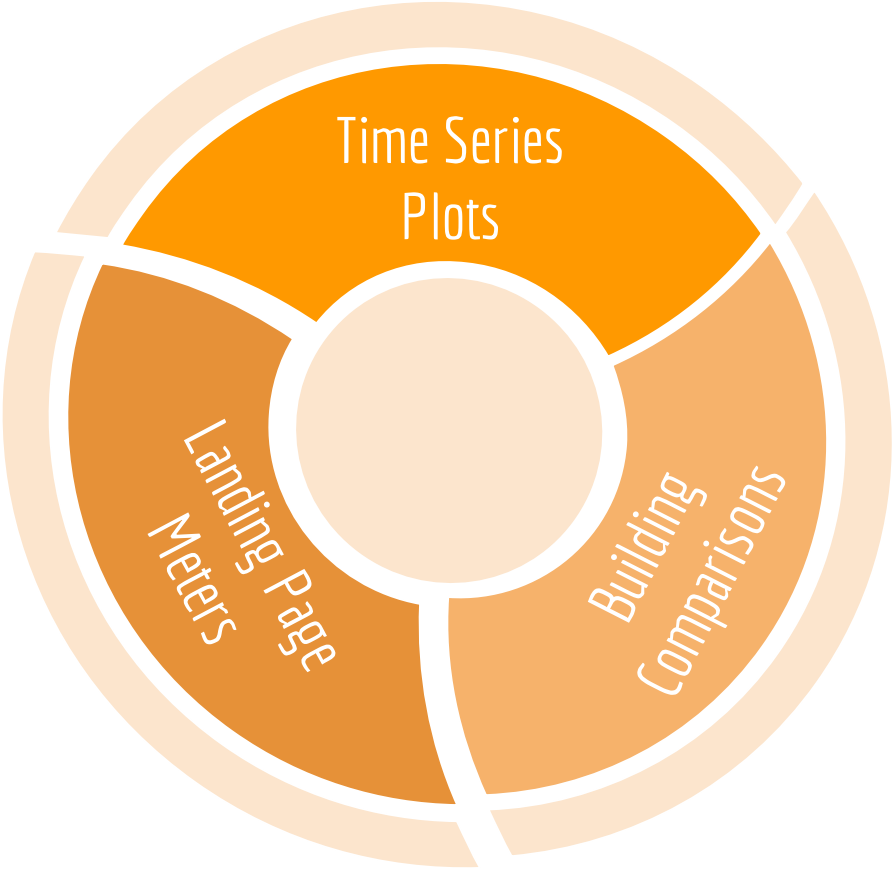



# We addressed improvement areas using four tasks

# 1. Understanding dashboard users

| Analysis | User Groups | Level of Knowledge | Use Cases |
| --- | --- | --- | --- |
| We analyzed previously collected feedback from users of the dashboard | We identified user groups based on the different types of people who may use the dashboard | We estimated the level of knowledge each user group would likely have | We established specific use cases for each user group, identifying which dashboard features would be most relevant |

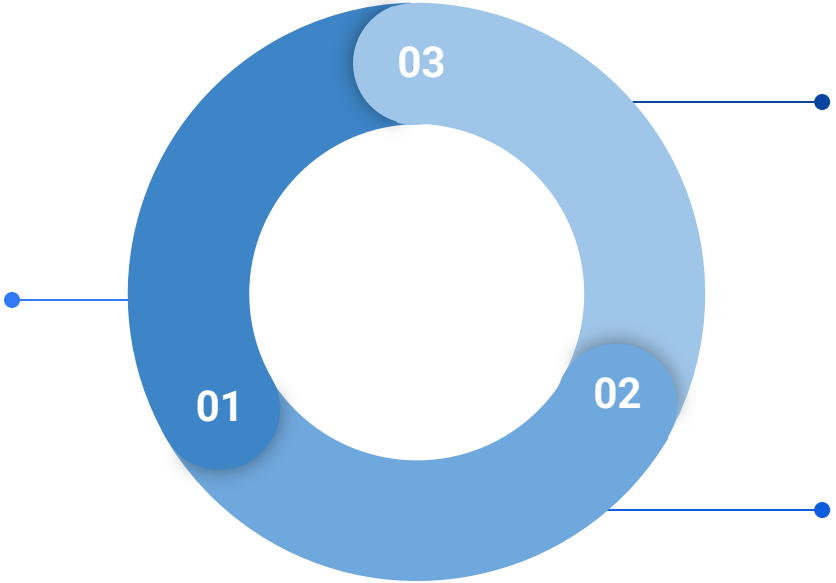
# 2. Implementing improvements to visualizations



# 3. We developed user documentation by writing the general portal help page and dashboard-specific help panels.

# 4. Conducting usability testing

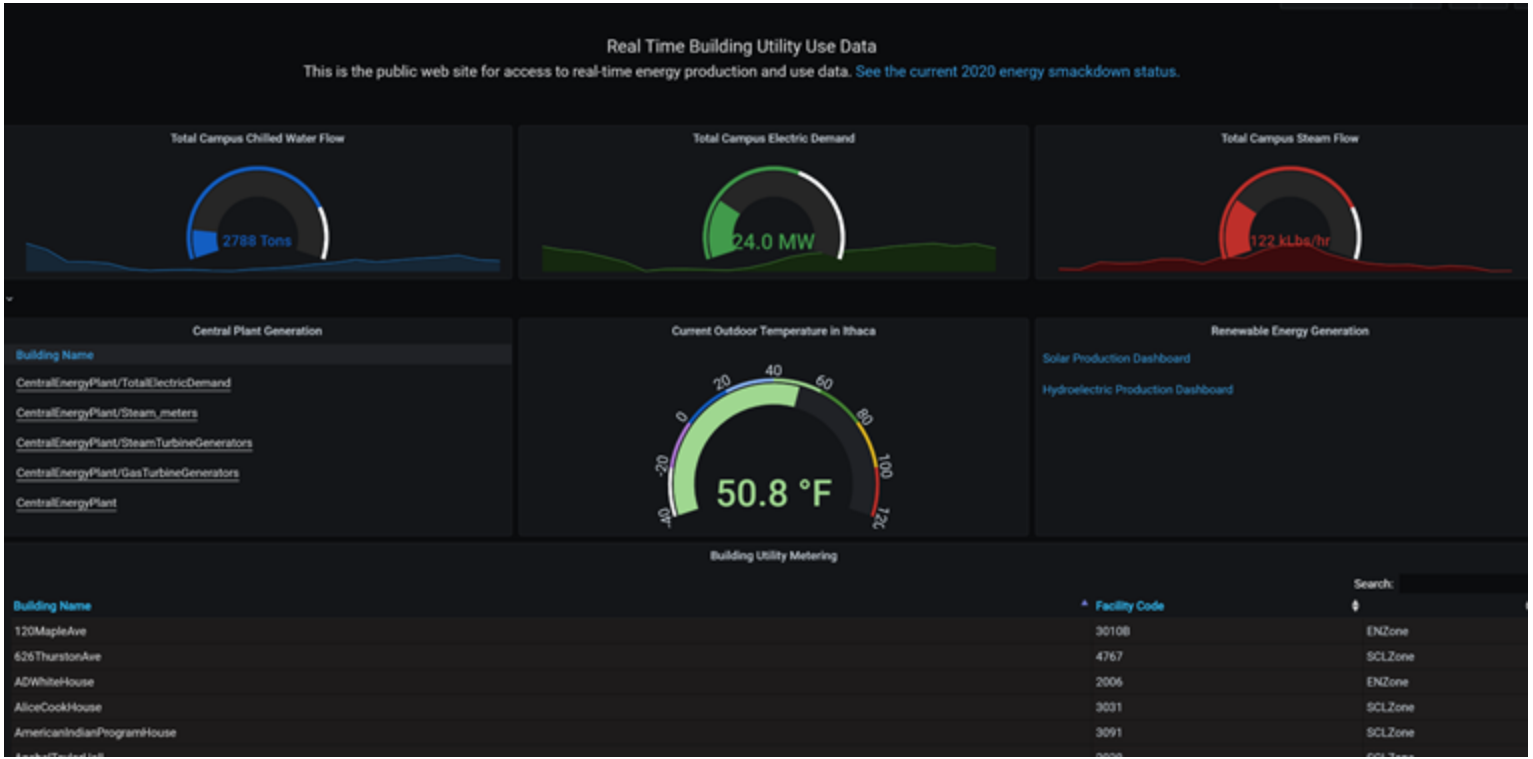
We drafted the usability testing memo



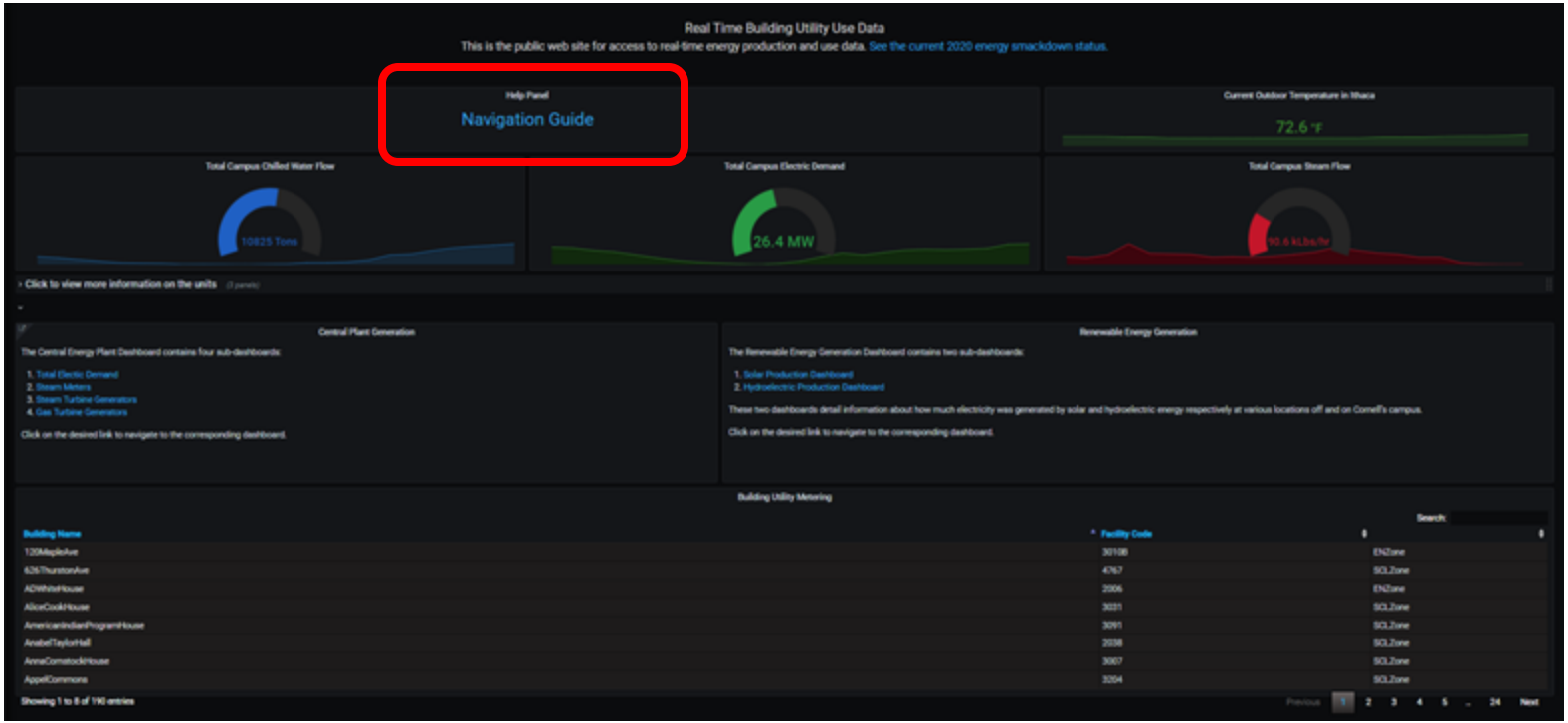

We analyzed the feedback and implemented changes

We gathered user feedback through Flipgrid

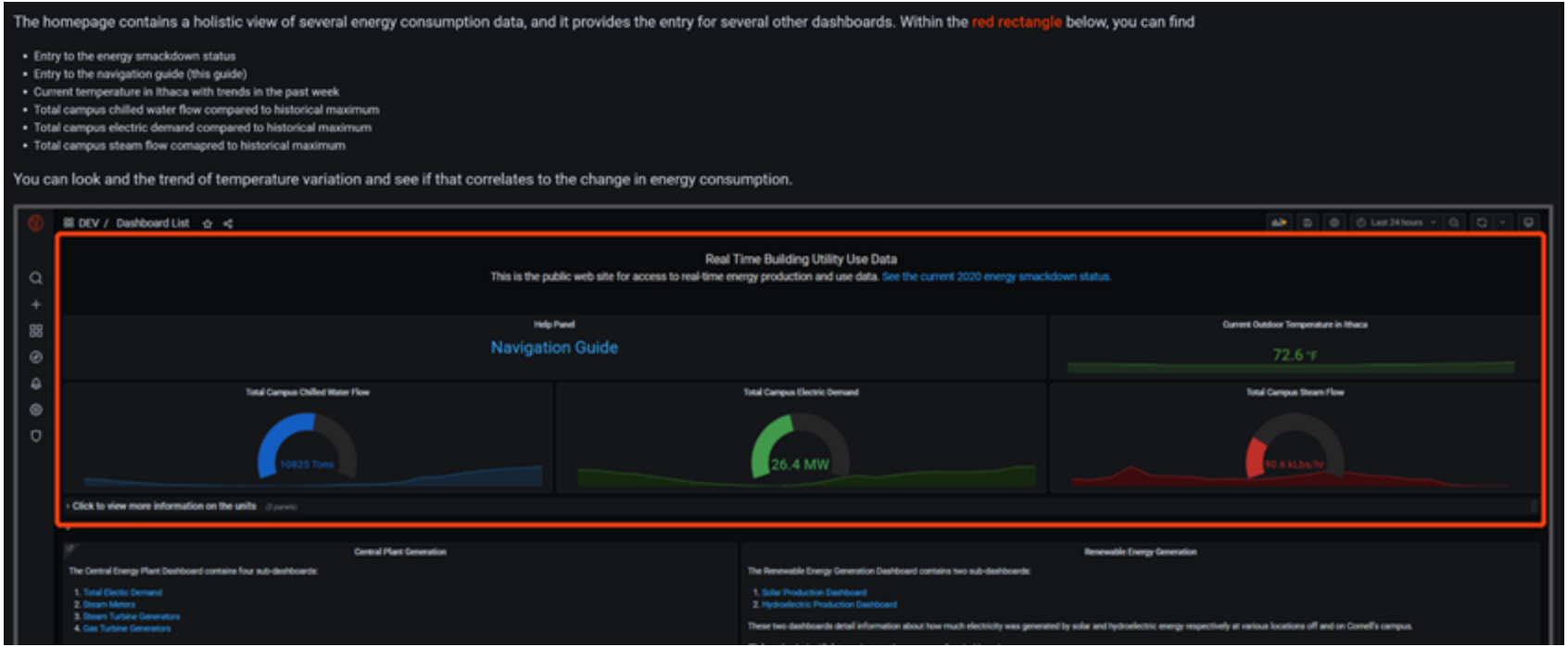
# The original EMCS homepage lacked navigation guidance



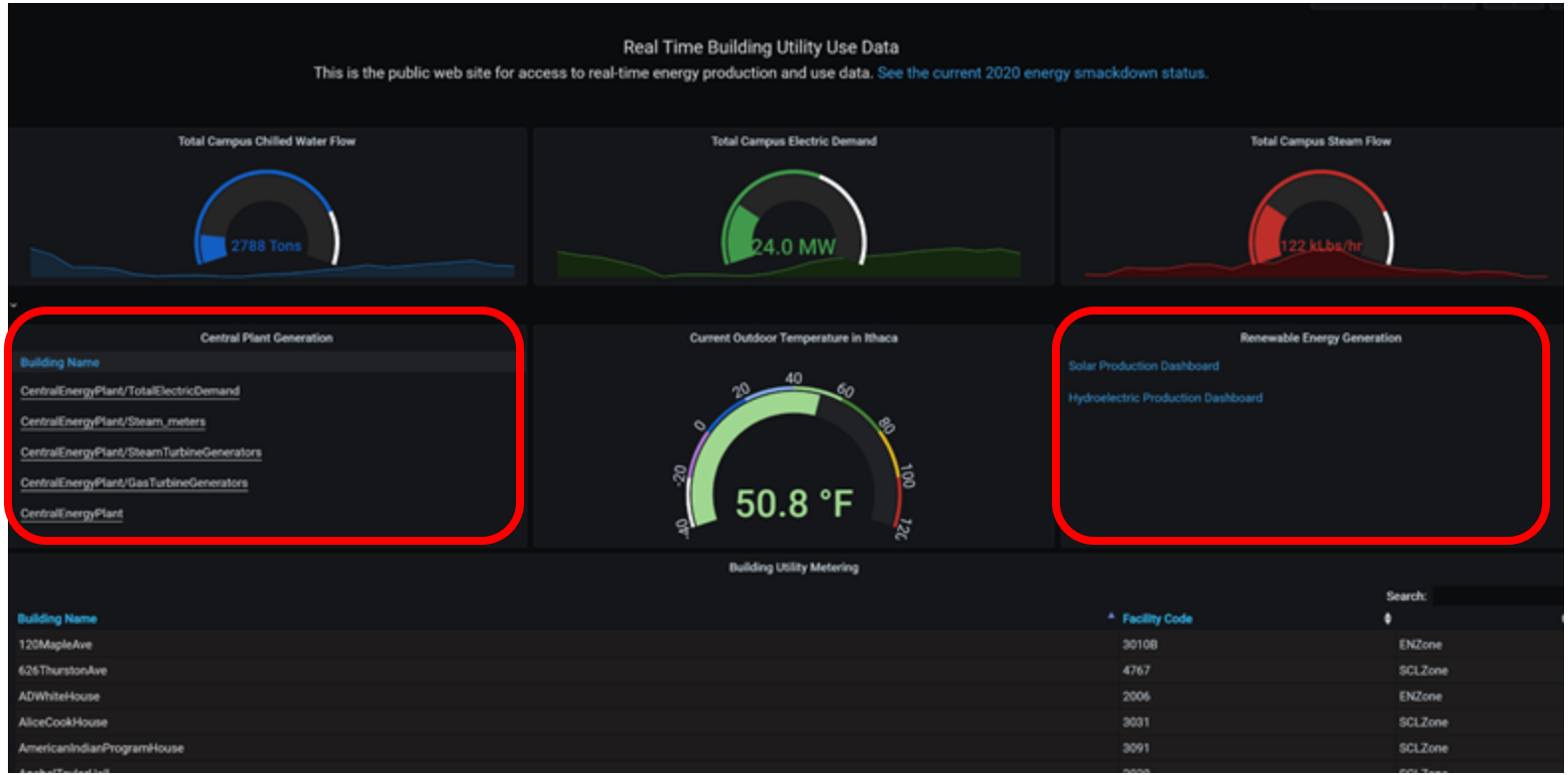
# A link to the navigation guide was added



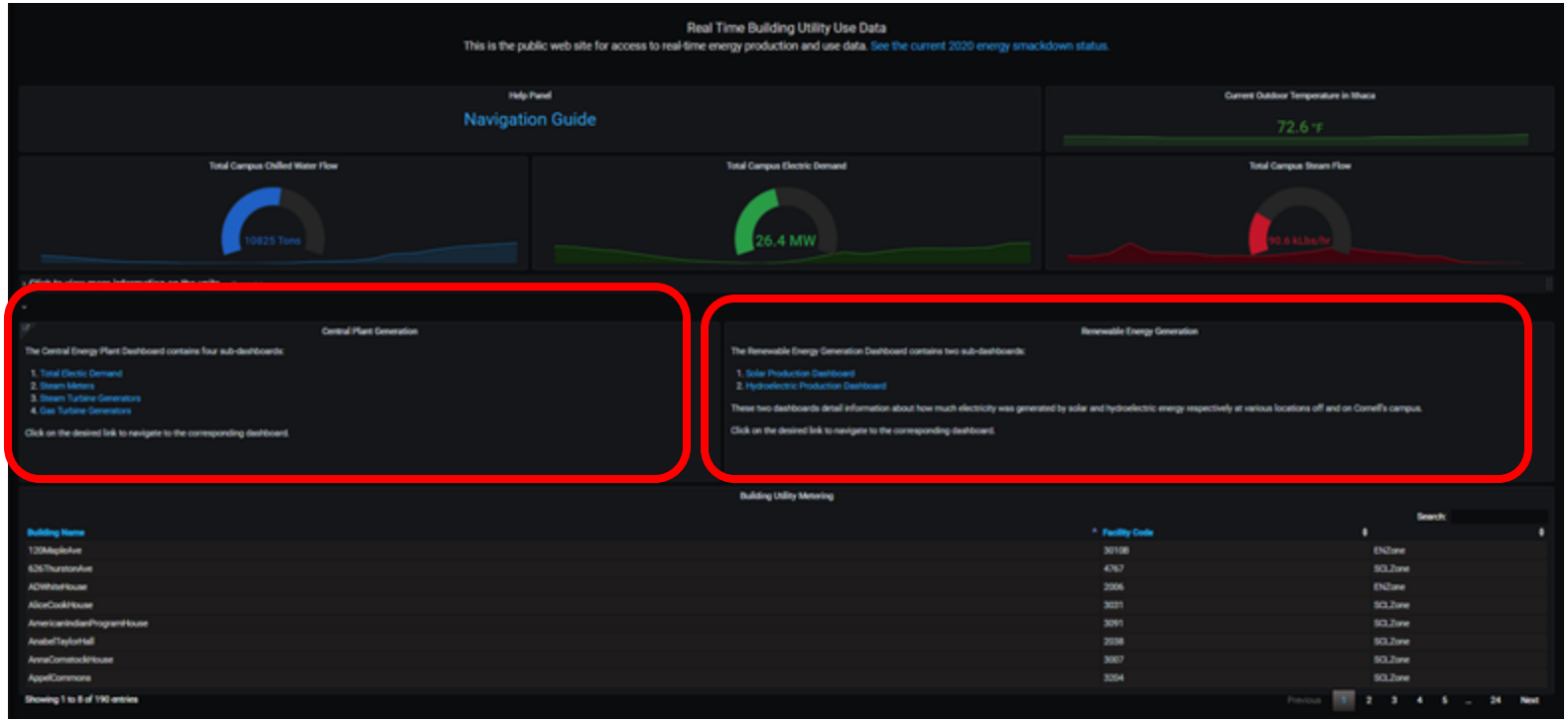
# We added screenshots for homepage navigation



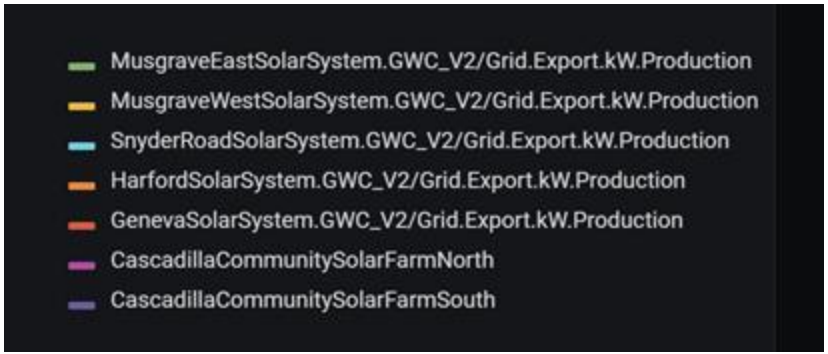
# The original EMCS homepage lacked panel explanations

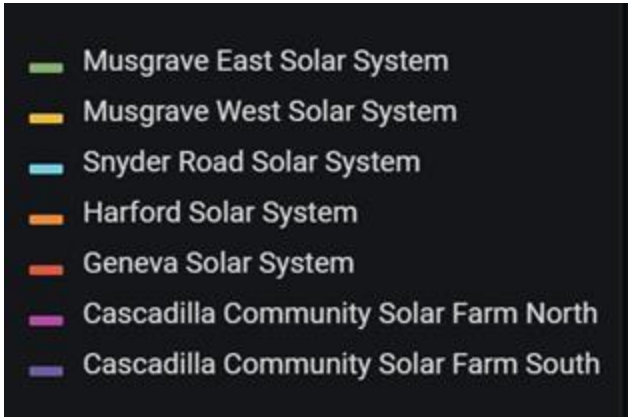


# We added explanations to help navigating into specific panels

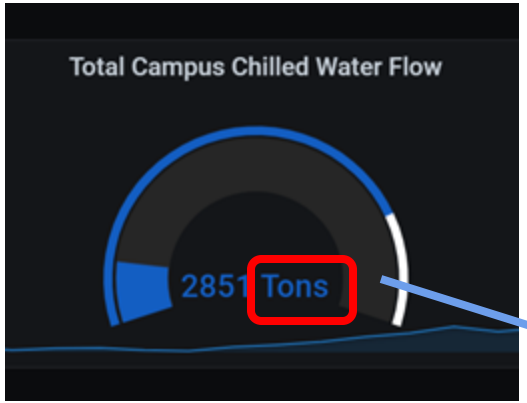


# Plot legends were changed to be user-friendly



# Original panels lacked explanations for units




# Specialized plots lack in-dashboard documentation


# We conducted usability testing to gather feedback

1

**First Step**

Familiarize the units for chilled water flow, steam flow, and electricity consumption

2

**Second Step**

Navigate to the Solar Production Dashboard. Play around with changing the time range and visualizing the data

3

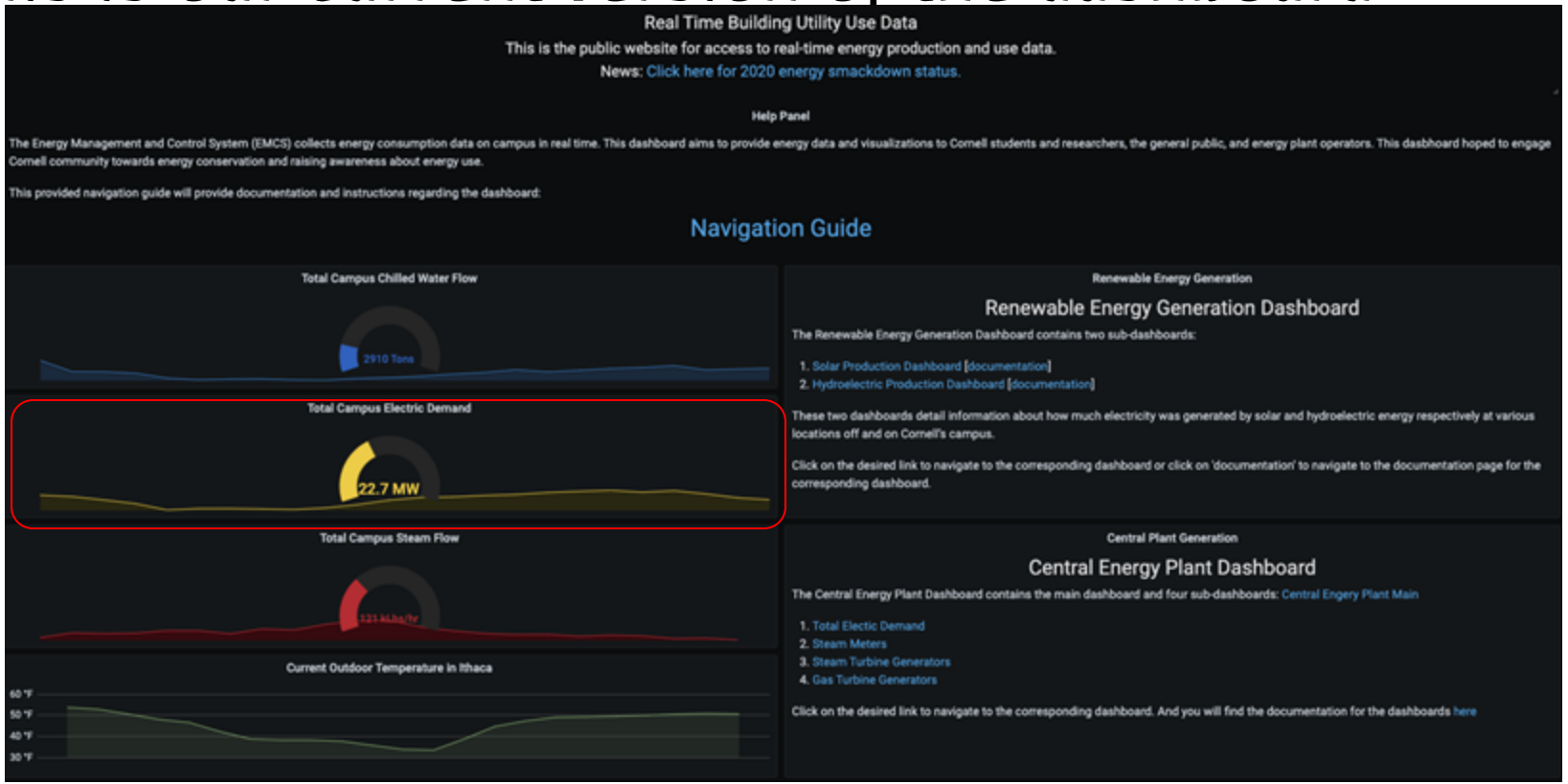
**Third Step**

Download the electricity consumption data of Upson Hall

# We revised the homepage according to suggestions

| | | |
|---|---|---|
| 01 | Marlaina | • Suggested splitting up the portal help page & comparison between solar power generation and electricity consumption |
| 02 | Kevin | • Navigation of the graphs and timeline was confusing. Ex. zooming out<br>• Resizing issues |
| 03 | Jack | • Suggested larger dashboard title headings<br>• Make fonts for renewable energy and CEP larger |
| 04 | Samuel | • Font size issues and resizing issues |

# This is our current version of the dashboard



# Thank you!

# References


[1] G. Sedrakyan, E. Mannens, and K. Verbert, "Guiding the choice of learning dashboard visualizations: Linking dashboard design and data visualization concepts," *Journal of Computer Languages*, vol. 50, pp. 19–38, Feb. 2019, doi: 10.1016/j.jvlc.2018.11.002.

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[3] L. K. Murugesan, R. Hoda, and Z. Salcic, "Design criteria for visualization of energy consumption: A systematic literature review," *Sustainable Cities and Society*, vol. 18, pp. 1–12, Nov. 2015, doi: 10.1016/j.scs.2015.04.009.

[4] MIT, "MIT Shares Energy Data with New Website: Energy Dashboard Will Provide Access to Campus Building Data." *Buildings*, no. 6, 2017, p. 12. *EBSCOhost*, search.ebscohost.com/login.aspx?direct=true&db=edsgbe&AN=edsgcl.498485228&site=eds-live&scope=site.

[5] Harvard University, "Harvard's 2019 Sustainability Report," Mar. 05, 2015. https://report.green.harvard.edu/ (accessed Mar. 28, 2021).

[6] University of California, Berkeley, "UC Berkeley Energy Dashboard." https://engagementdashboard.com/ucb/ucb (accessed Mar. 28, 2021).