

Power Management User Interface



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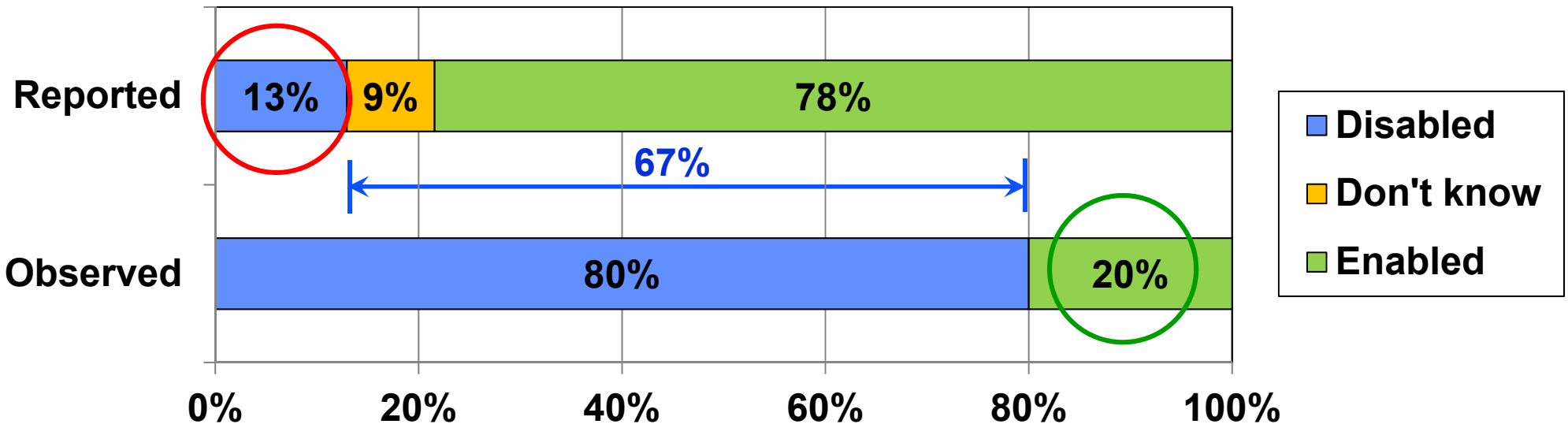
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Desktop Computers and Sleep

- **Problem:** Existing low-power modes on desktops are not being efficiently employed by users.

Are Computer Sleep Settings Enabled?



- **Proposal:** Design and test new user interface software to facilitate and encourage engagement of power management options.
- **Funding:** CEC GFO-15-310, Plug Load Technologies and Approaches for Buildings, through the EPIC program



Power Management User Interface Project

➤ Stage I: Design interface

- **Manages computer sleep and display sleep**
- **Designed to be easier to access, easier to use, and motivating**
- **Features based on research and theory on human-computer interaction, behavioral change, and effects of feedback on pro-environmental behavior**



Power Management User Interface

The screenshot shows a web-based interface for power management settings. The window title is "PMUI". The main header is "pmui Sleep Settings". A left sidebar contains navigation options: "Sleep Settings" (selected), "Reports" (with sub-items "Usage Report", "Time Spent Idle", and "Patterns Over Time"), and "FAQ". The main content area is titled "Sleep Settings" and is divided into two sections: "Computer" and "Display".

Computer
Computer goes to sleep after

How can I reduce my computer's idle time?

1 min 3 mins 10 mins 20 mins 30 mins Never

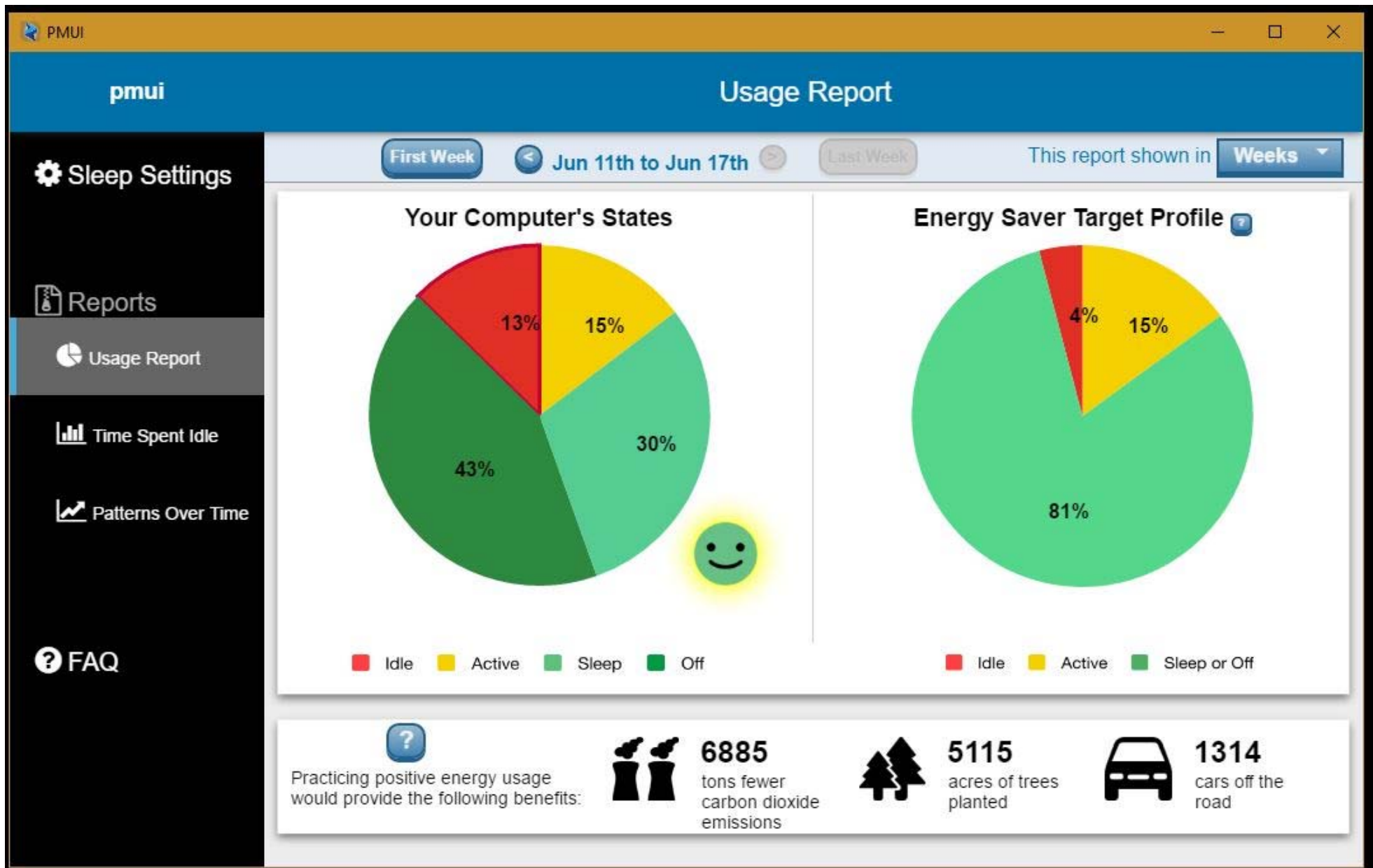
Display
Display goes to sleep after

1 min 2 mins 3 mins 5 mins 10 mins Never

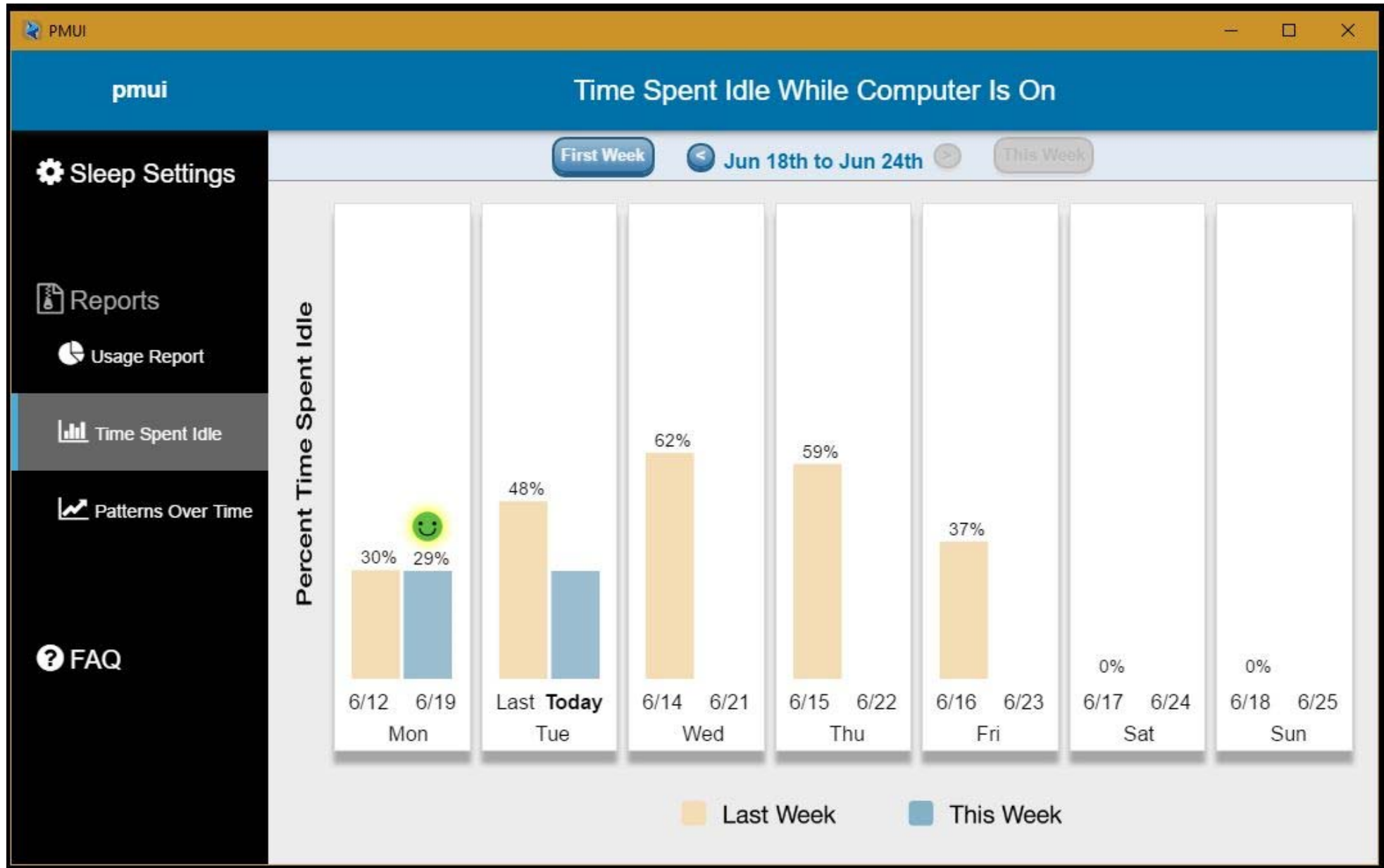
To temporarily disable your sleep settings, click this box:

1 hour

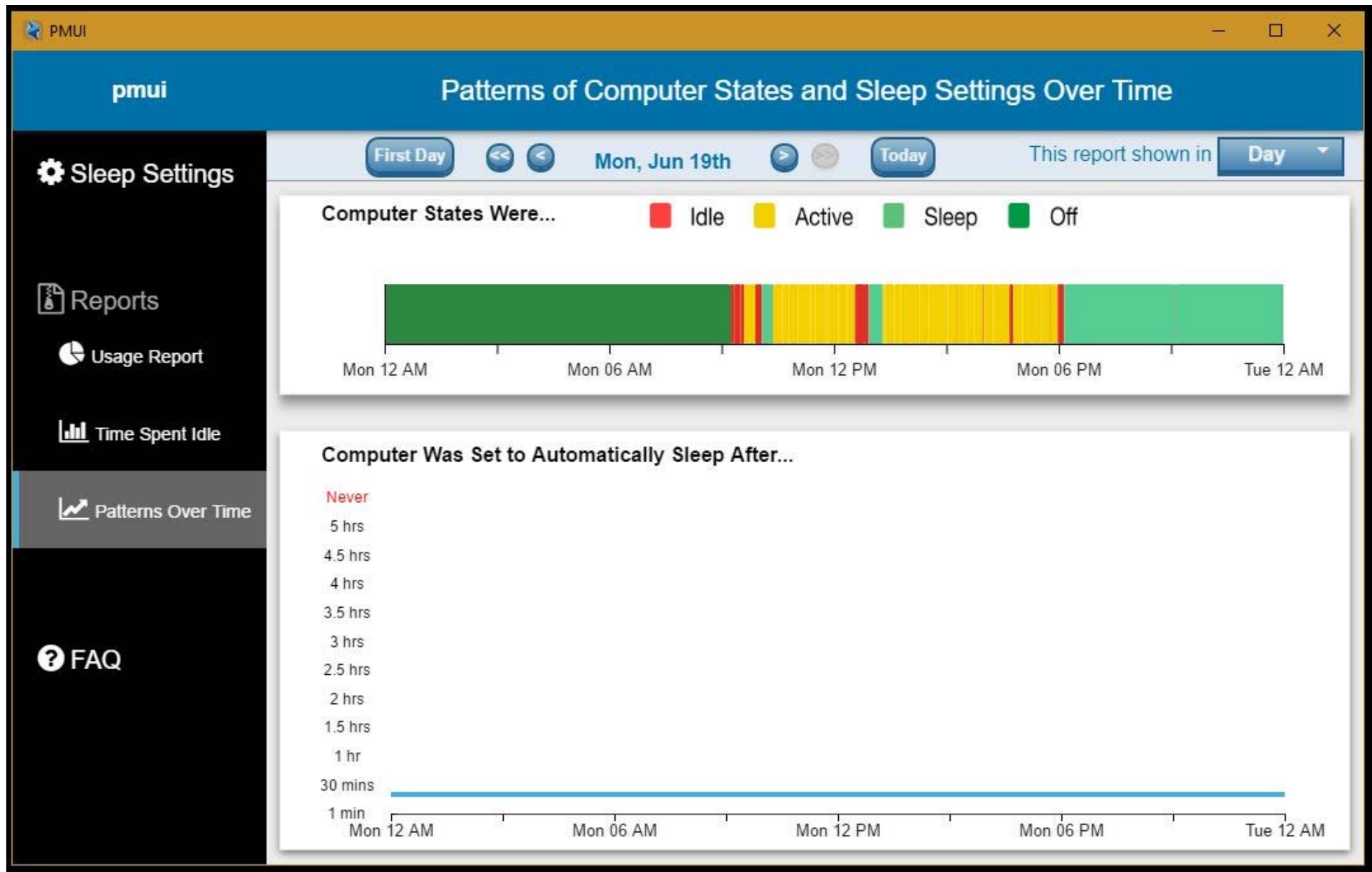
Power Management User Interface



Power Management User Interface



Power Management User Interface



Power Management User Interface

PMUI

pmui

FAQ

Sleep Settings

Reports

- Usage Report
- Time Spent Idle
- Patterns Over Time

FAQ

Frequently Asked Questions

Need more help? Contact us at pmui@calit2.uci.edu

- + What does PMUI stand for?
- + What do the terms "off," "sleep," "active," and "idle" mean?
- + How much energy does my computer use in each of these states?
- + How can I save more energy with my computer?
- + What about the energy used by my computer display/monitor?
- + What is the Energy Saver Target Profile?
- + Why is some of the data missing on my report pages?
- + Why do the reports say my computer went off if I didn't turn it off?

Data Collection

➤ Stage II: Field test

- Desktops on UCI campus
- Collect data on energy use, sleep settings, computer states, self-reports

1 month

2 months

Visit 1

Visit 2

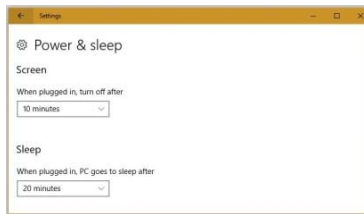
Visit 3



PMUI in
observation
mode



Experimental:
shown PMUI
interface



Control:
shown standard
sleep settings



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Hypotheses



- More subjects change sleep settings *after* RV2 than before.
- More Experimental than Control subjects *enable* sleep (if disabled).
- More Experimental than Control subjects *improve* sleep settings (if already enabled).
- *But*, Experimental no more likely than Control subjects to disable sleep or to make existing sleep settings worse.

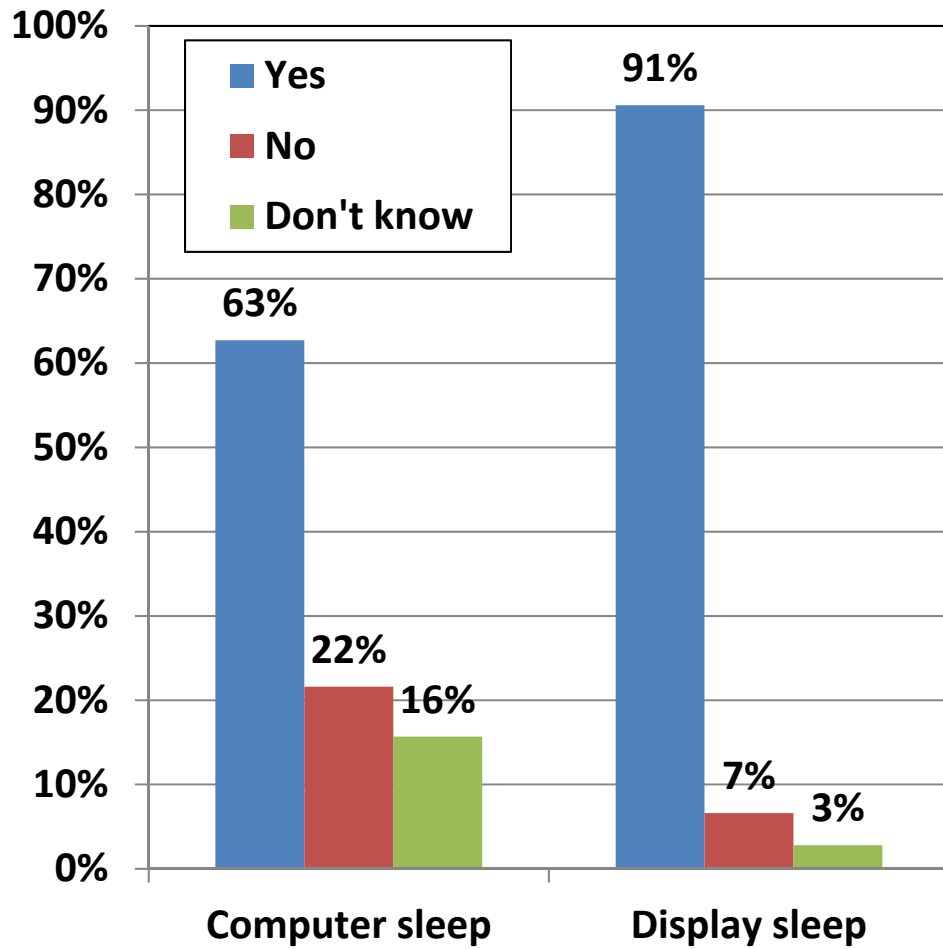


Data Collection: Current Status

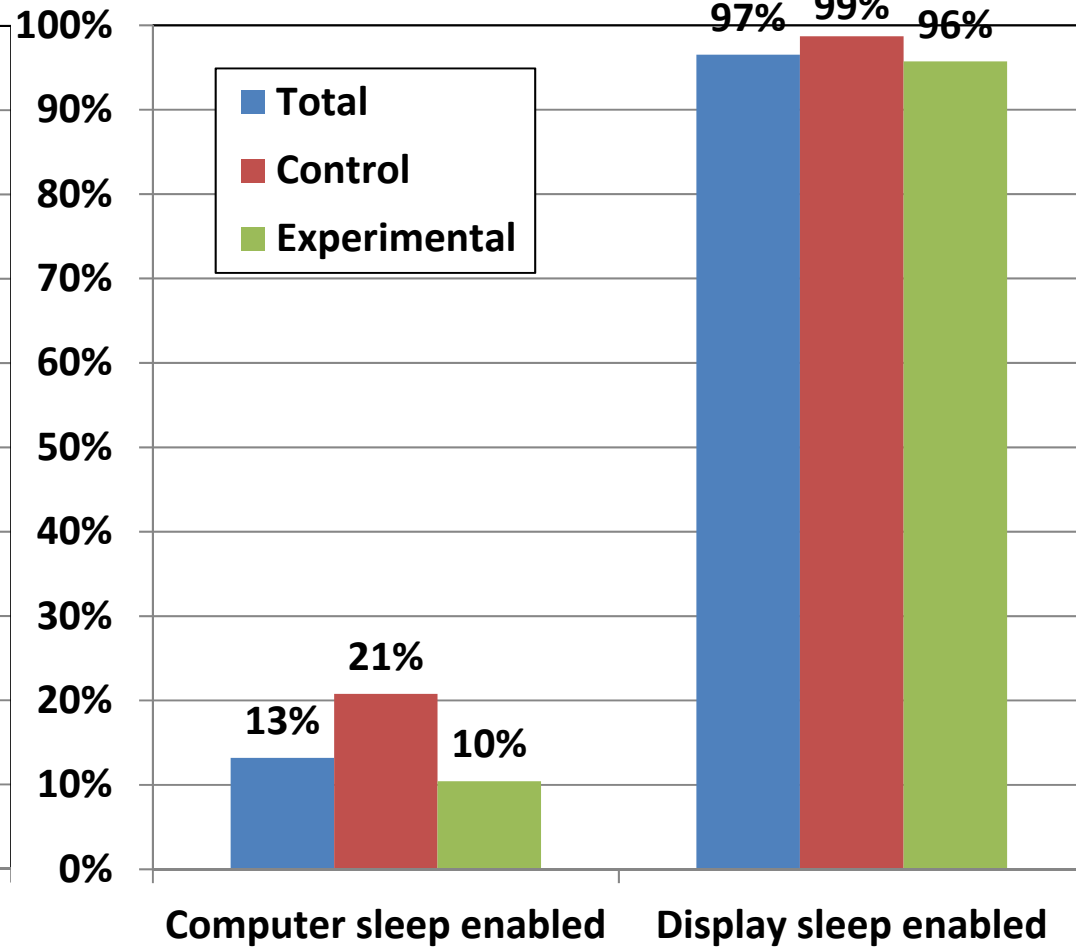
- **419 Subjects started (Research visit 1)**
- **415 Subjects completed baseline period (Research visit 2)**
- **341 Subjects finished (Research visit 3)**
 - **Preliminary full results available:**
 - **Sleep settings from software data: N = 288**
 - **RV2 questionnaire: N = 287 valid**
 - **RV3 questionnaire: N ≤ 273 valid**



Is Sleep Enabled?



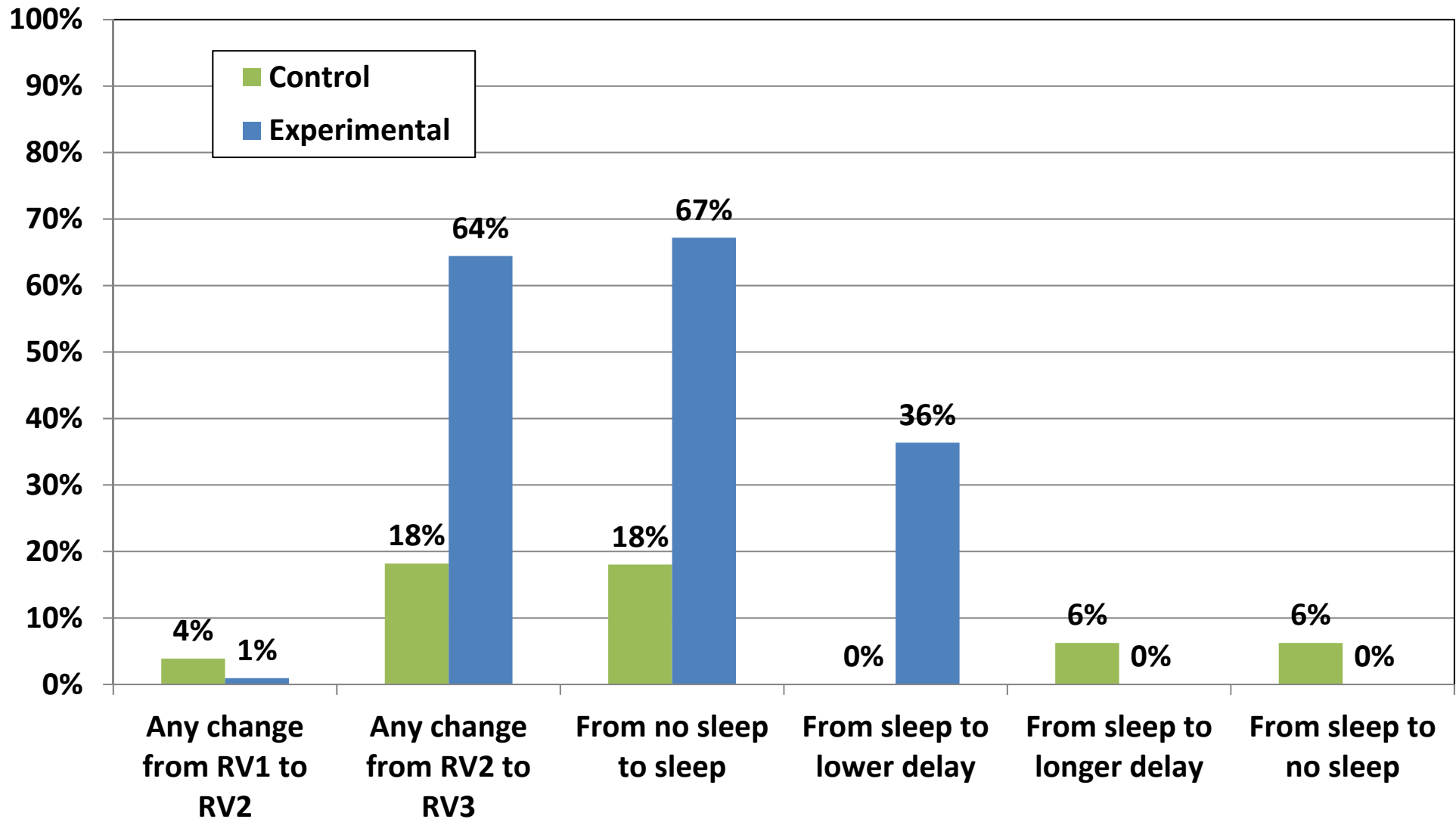
Self-reported at RV2



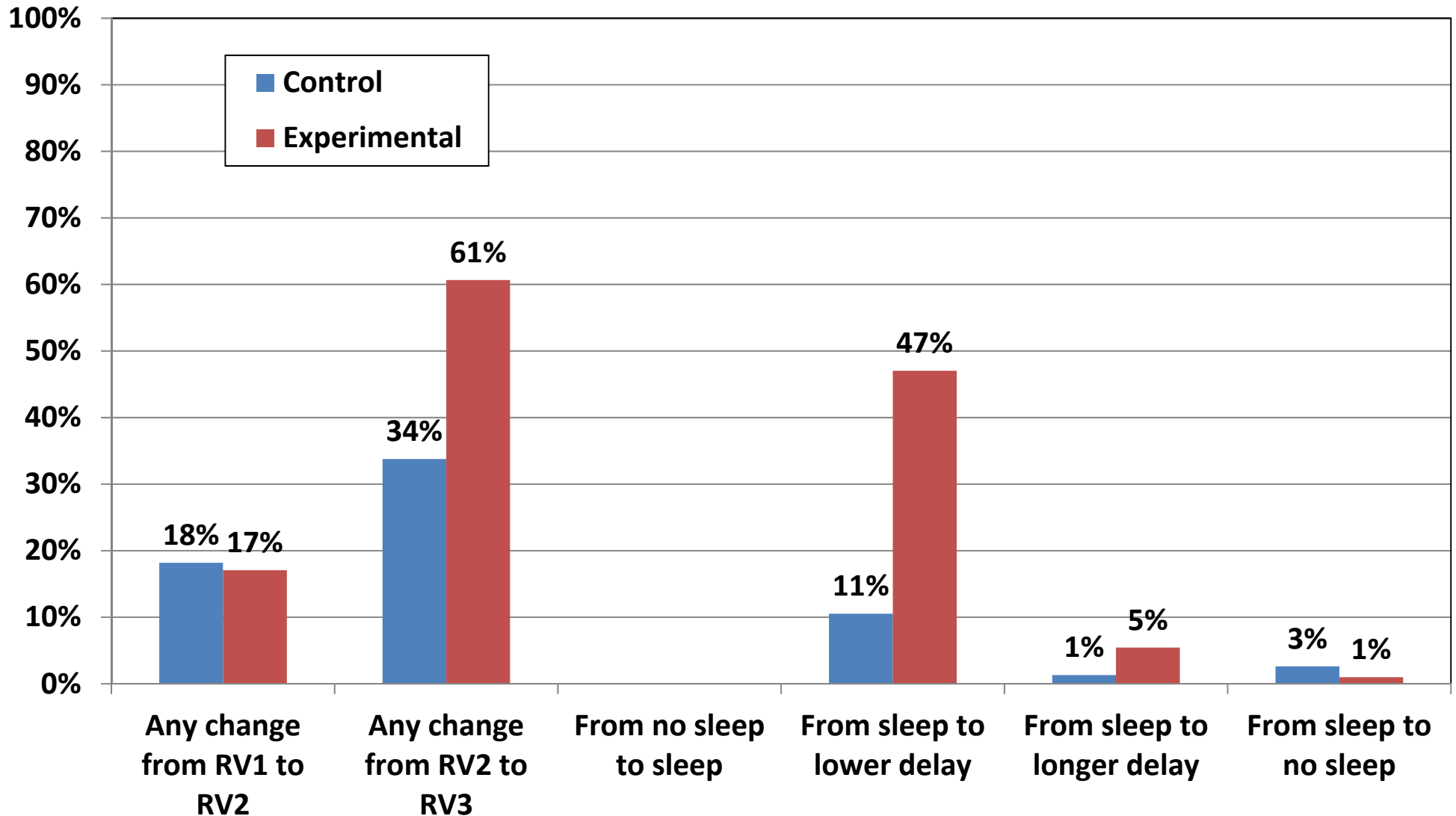
Observed at RV1



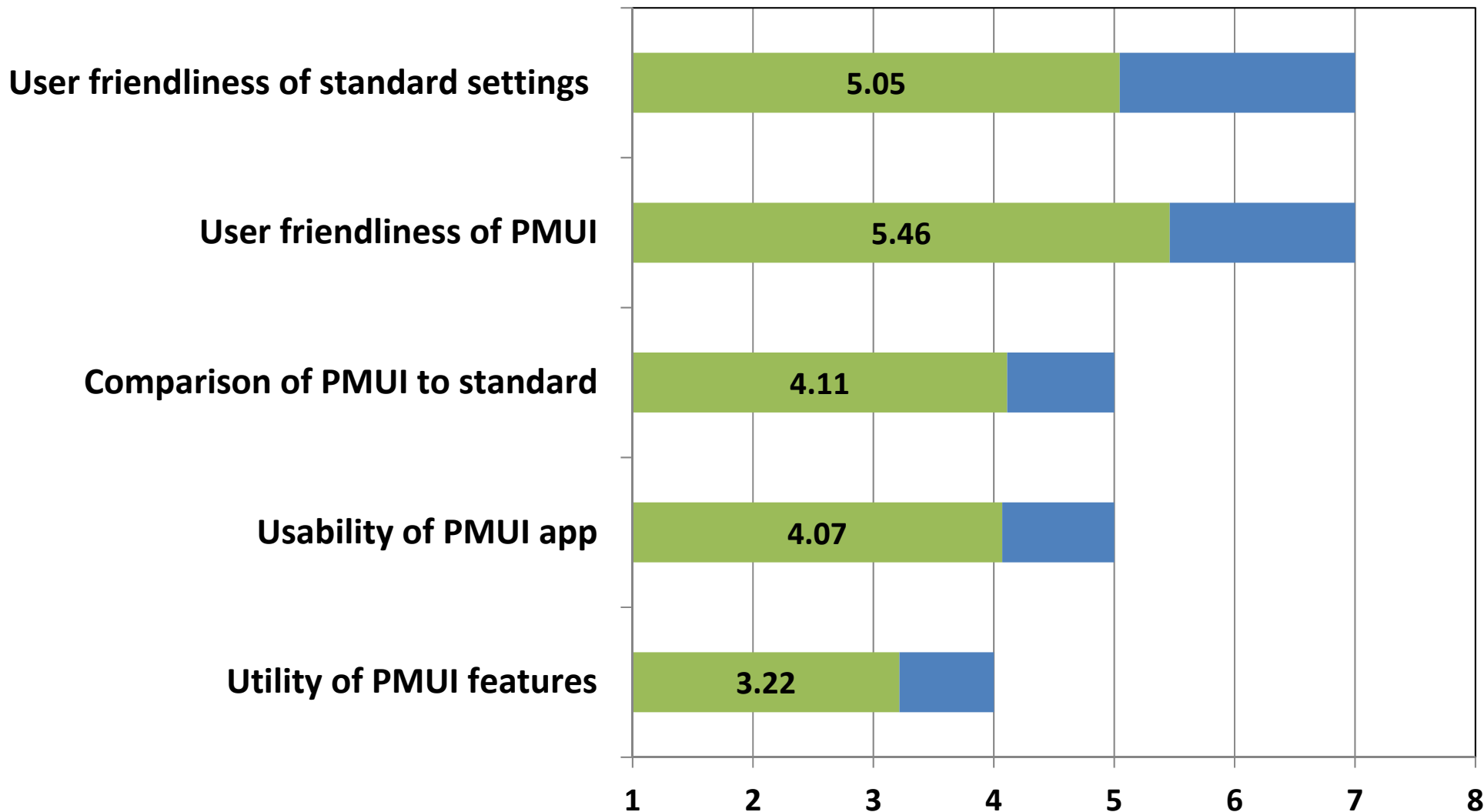
Changes in Sleep Settings for Computer



Changes in Sleep Settings for Display



Ratings of PMUI Program



Note: Limited to Experimental subjects.



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PMUI Next Steps

- **Stage III: Process results**
 - **Did the feedback change user behavior?**
 - **Estimated energy savings attributed to new user interface**
 - **Feedback on the interface and possible improvements**
 - **Data on user behavior toward computers and power management**

Planned

- **Stage IV: Revise and distribute**
 - **Update software**
 - **Create standalone (non-research) version**
 - **Seek partners to distribute**
 - **Seek funding to develop and test version for laptops**



Later today: PMUI demo

Thank you!

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