

Capturing the next 10%:  
Finding, verifying, and preserving  
operational savings with circuit-level  
monitoring

Paul Gromer  
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## The challenge

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We are # 1, and  
# 1 is not good enough.



Looking for 25% GHG reduction by 2020  
and 80% by 2050. Much of that needs  
to come from efficiency.

Even the best retrofit and new construction programs in the country will not  
get us to those goals. We need more.



# The case for operational savings

## LBNL Study

- “Significant and highly cost-effective energy savings”
- Energy savings of 10% across 24 buildings
- Median electricity savings of 9%



## NRDC Study

- 13% savings
- “Large amounts of electricity are used in commercial office buildings to do no useful work. The electricity is simply wasted, every day and night, to power systems that do not improve the operation of the buildings or supply tenants needs.”
- “Many programs . . . are focused . . . on retrofits. This case study shows that emphasis on operational improvements is also warranted.”





# Challenges and a solution

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## Challenges for operational programs

- Finding the opportunities
- Verifying the savings
- Ensuring persistence

## A solution

- Circuit-level monitoring
- Coupled with expert advice
  - Key finding of NRDC study:

Better information is necessary but not sufficient.  
Information + expert advice is the key to success.



# What is circuit-level monitoring?





# 3 case studies



Commercial



Multi-family



Municipal



# Commercial building





# Where are the savings opportunities?



More information is needed.  
The electric bill is not enough.

## Electricity Used

Rate B2-Large General-Secondary  
Meter 5035298

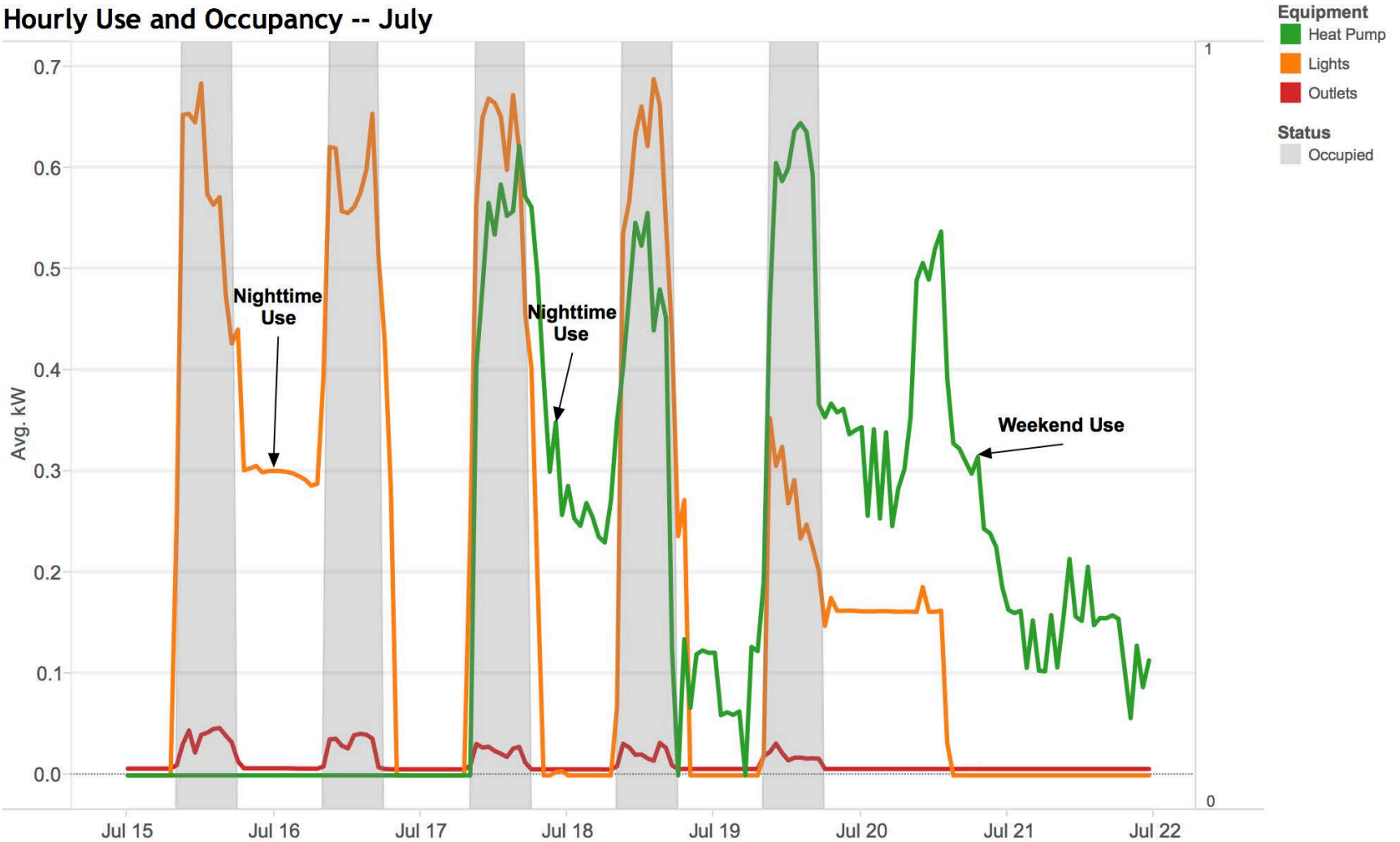
Sep 25, 2013 Actual Read		74395
Aug 25, 2013 Actual Read	-	72241
31 Day Billed Use		<u>2154</u>

5035298	KWH	DMD
09/25	2154	10.0
08/25	2515	8.5
07/25	2729	10.1
06/25	2071	10.6
05/25	1831	7.6
04/25	1779	6.5
03/25	2031	6.3
02/25	2682	7.0
01/25	2686	8.8
12/25	2381	6.9
11/25	2228	7.9
10/25	1784	6.9



# Finding opportunities

## Hourly Use and Occupancy -- July





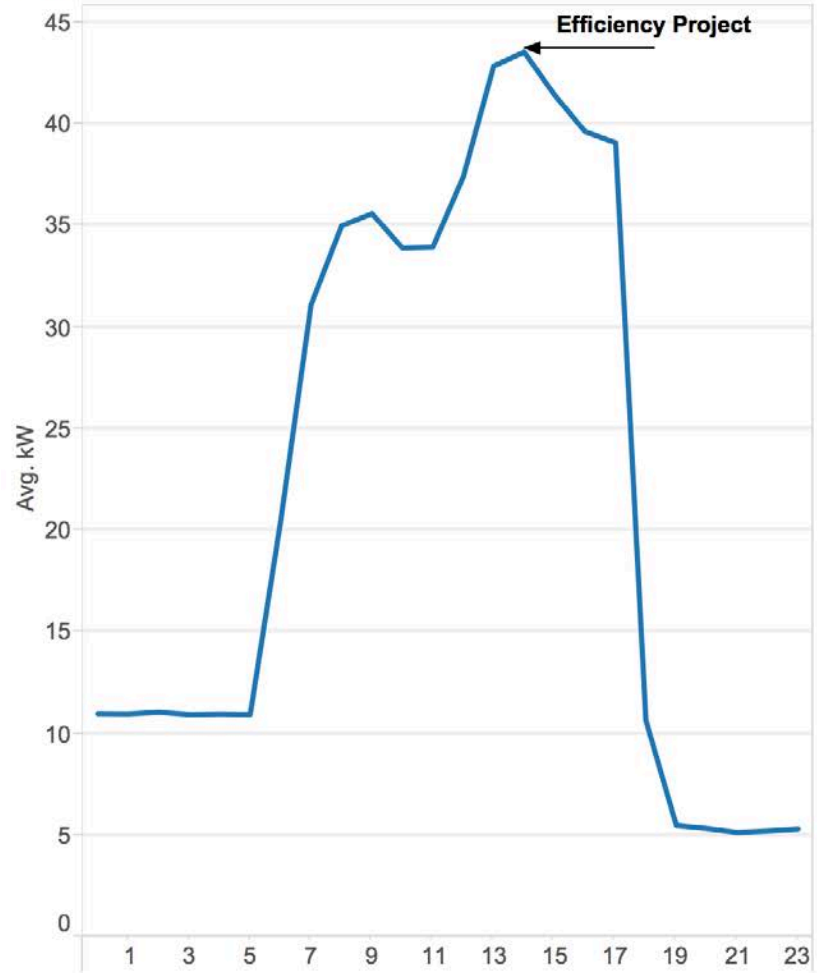
# Municipal



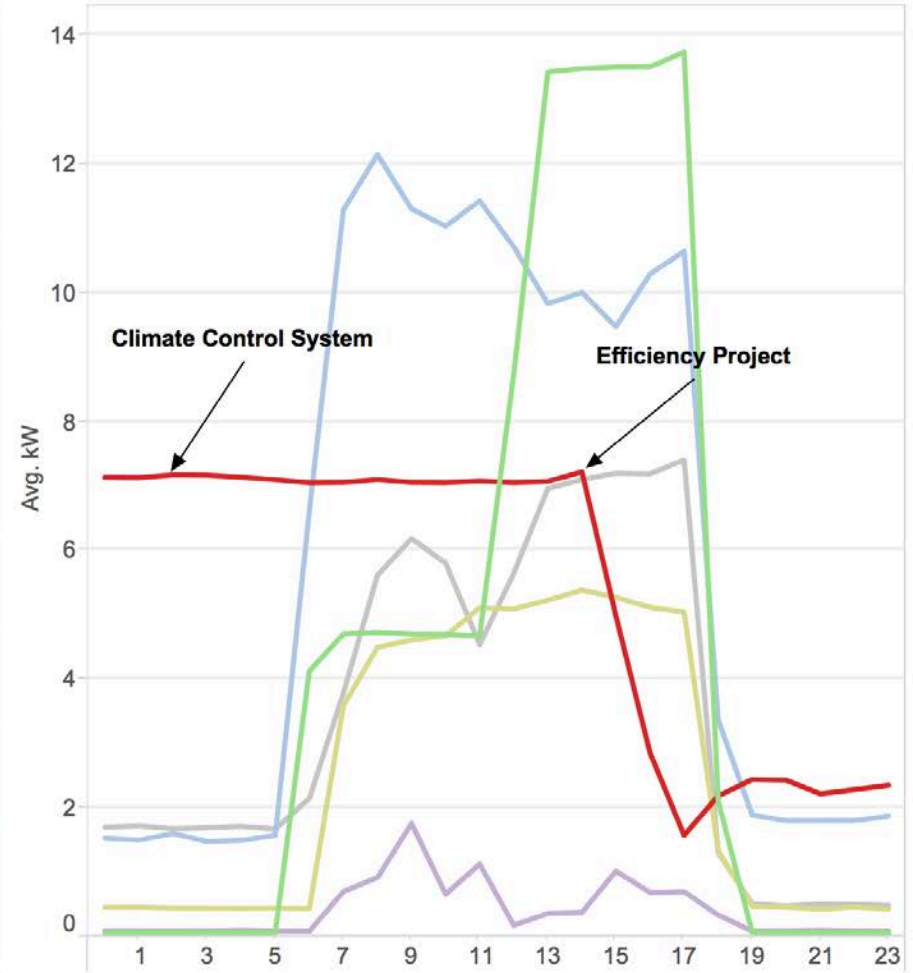


# Verifying savings

### Building-Level Data



### Circuit-Level Data





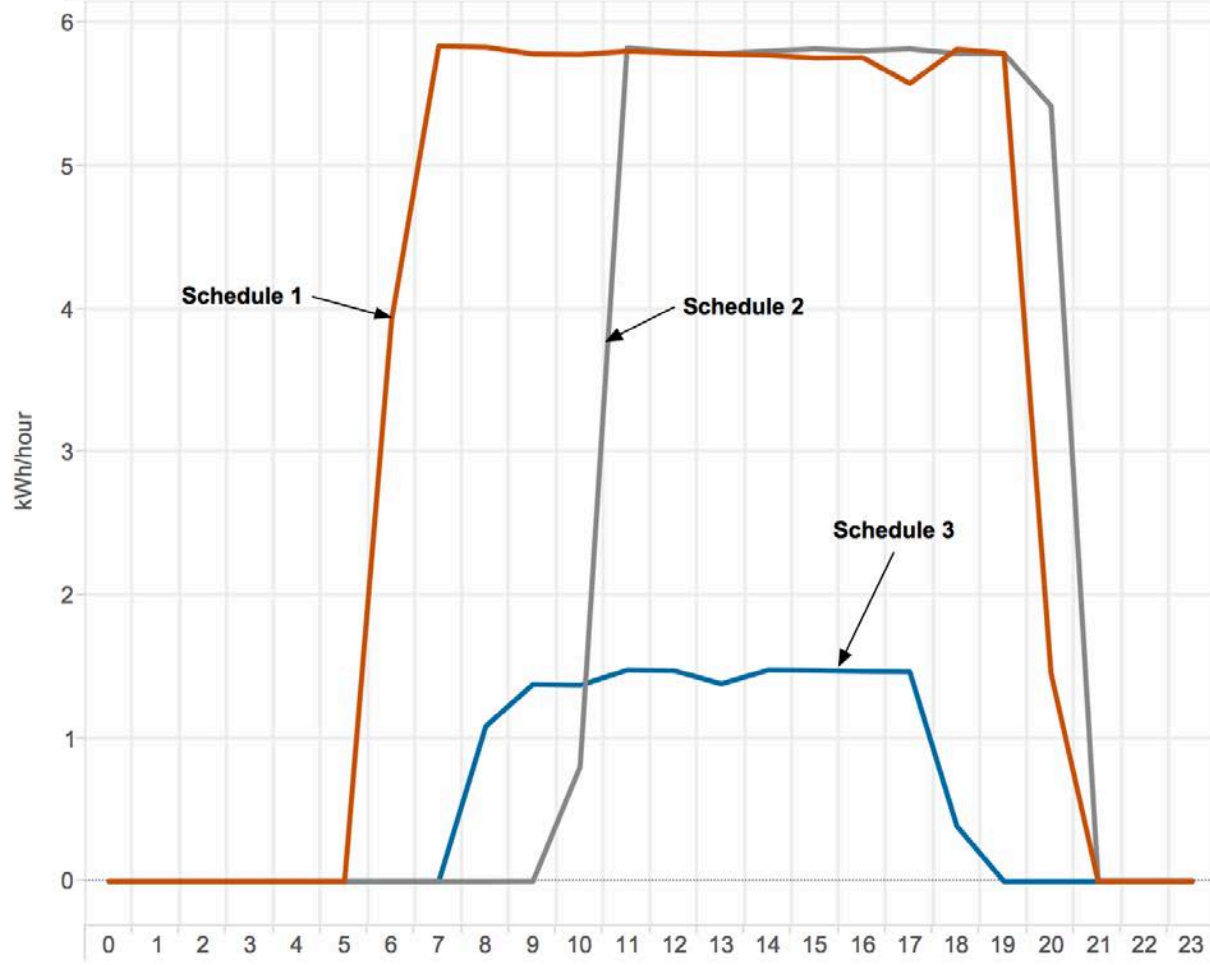
# Multi-family



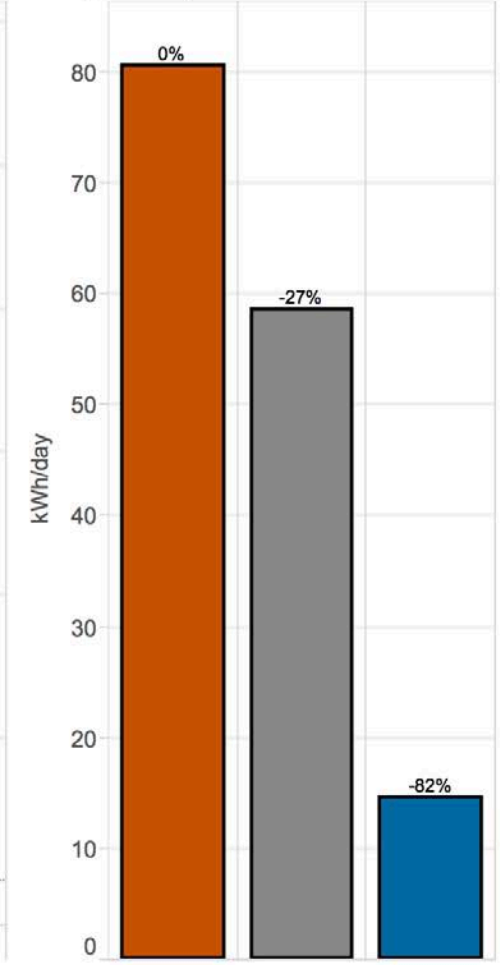


# Verify the savings

Use per Hour



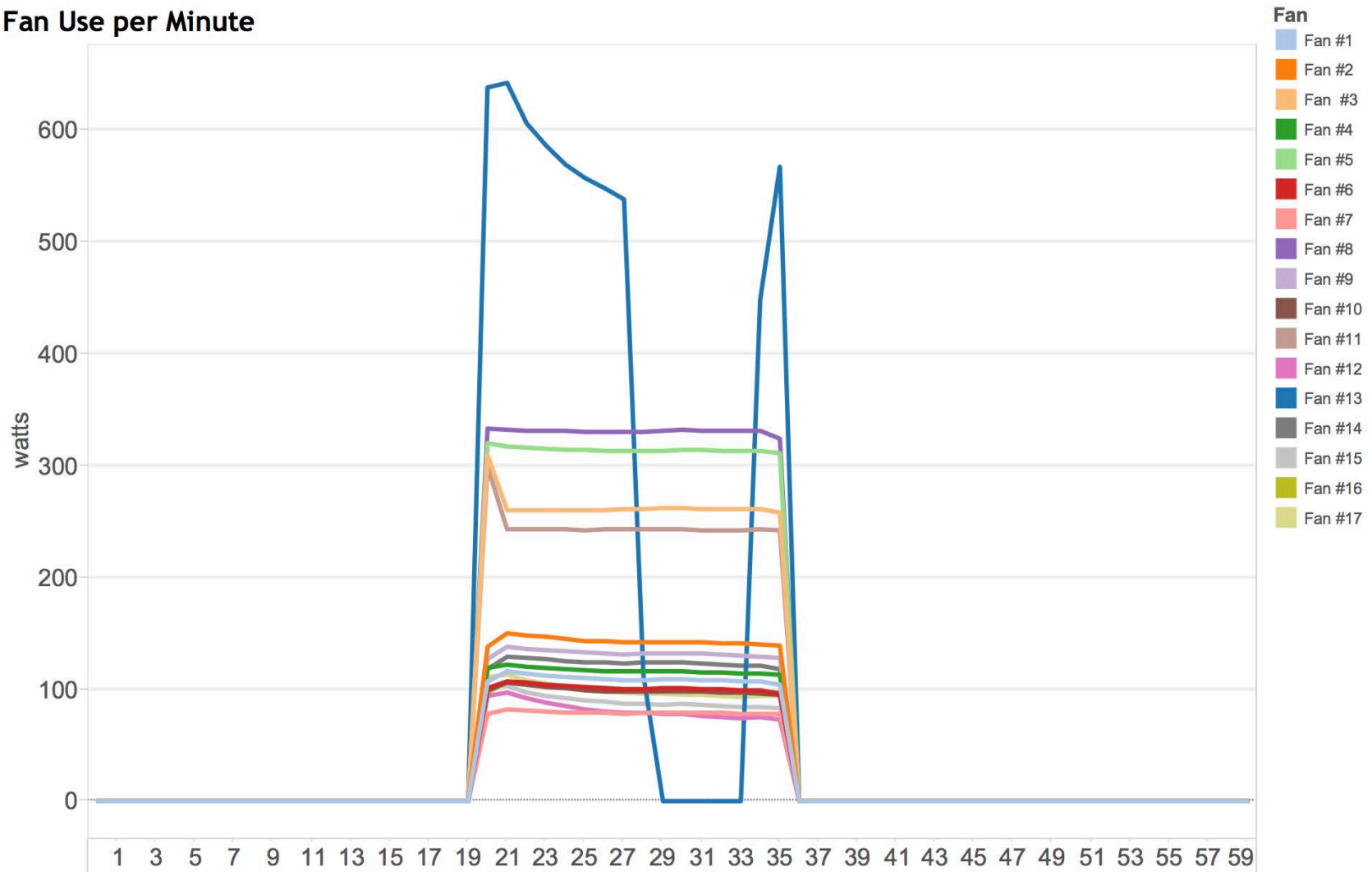
Use per Day





# Flagging equipment problems

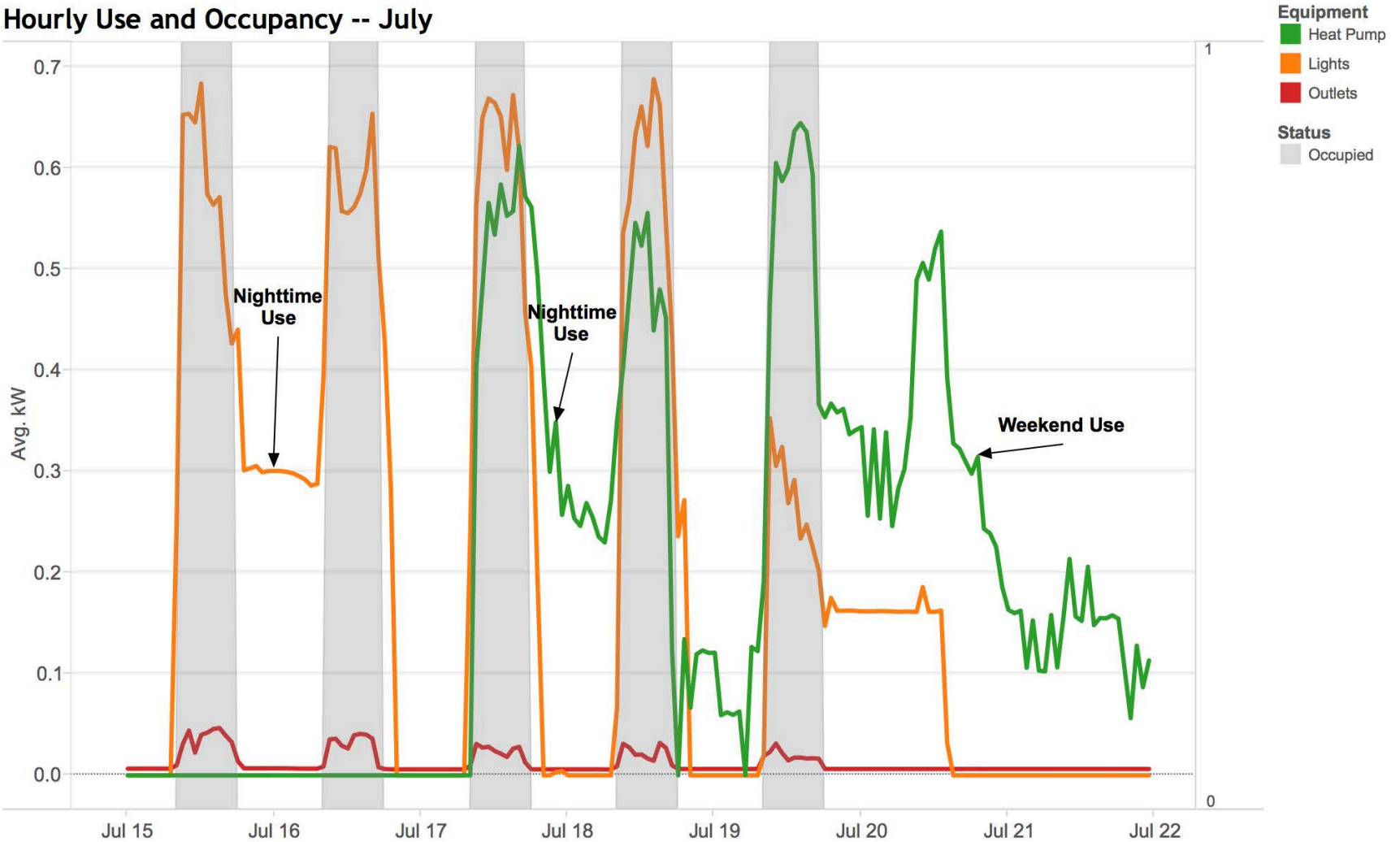
## Fan Use per Minute





# Ensuring persistence

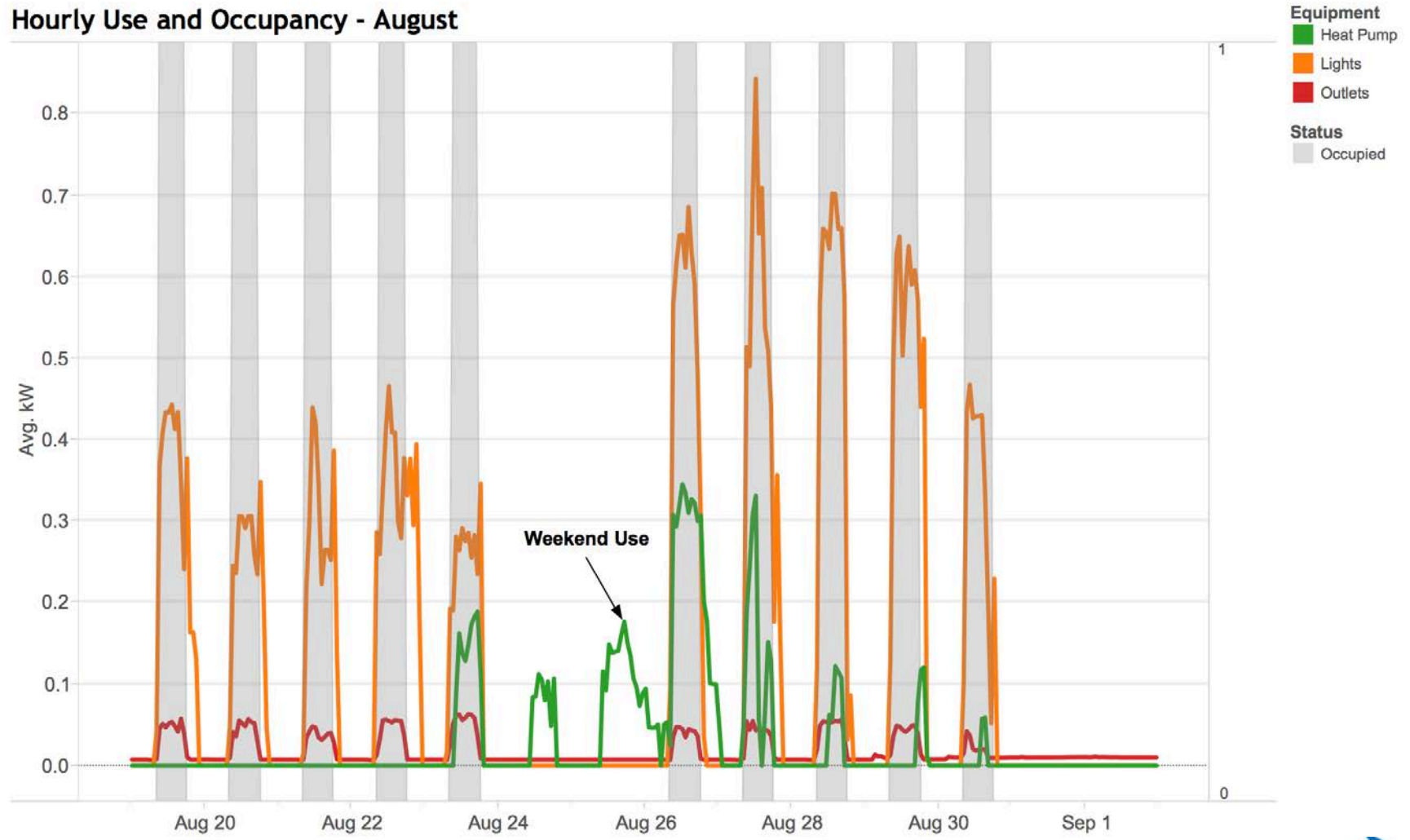
## Hourly Use and Occupancy -- July





# Ensuring persistence

## Hourly Use and Occupancy - August





# Conclusions

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Retrofit programs are providing huge benefits, and they are not enough.

Operational initiatives offer enormous potential – an additional 10% savings at very low cost.

The challenges for operational programs include:

- identification of savings
- verification
- persistence

Circuit-level monitoring (coupled with expert advice) can resolve those challenges and unlock the benefits of operational savings.

Circuit-level monitoring can get us the next 10%.