



DRIVING TRANSFORMATION

Behavior, Energy & Climate Change (BECC) / November 12-15, 2023 / Sacramento, CA

Co-Convened by

Stanford

Environmental and Energy
Policy Analysis Center

ciee
California Institute
for Energy and Environment

CITRIS
THE BANATAO
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ACEEE

SCE Dynamic Rate Pilot

How Flexible Pricing, Education and a “Robot” Reduced Energy Costs for K-12

November 15, 2023

Tanya Barham | CEO and Founder, Community Energy Labs

Julie Hayes | Principal and Founder, JHC

Convened by:

California's renewable policies and system consequences

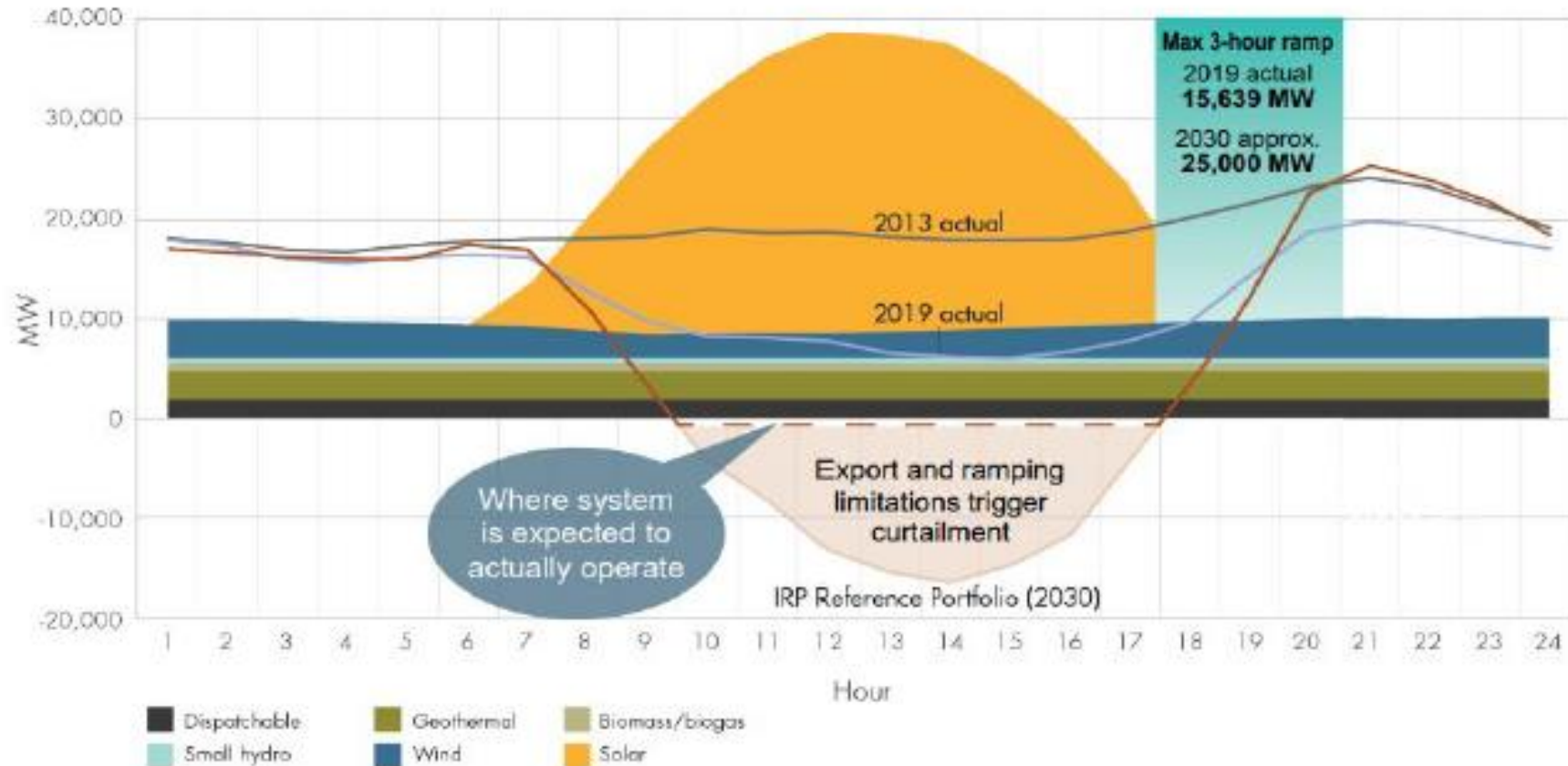
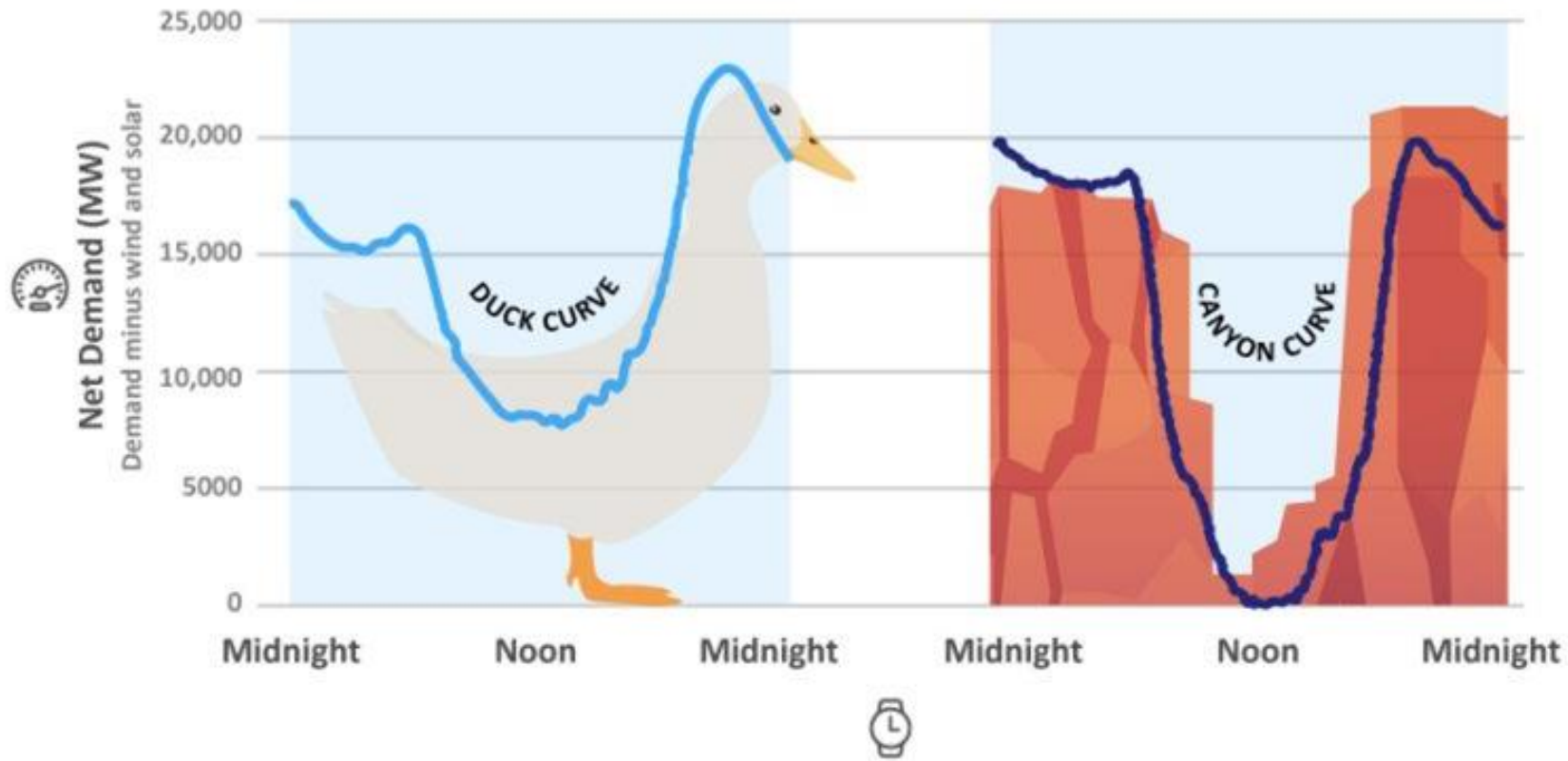


Figure 3-2: CAISO's outlook for projected curtailment and max 3-hour system ramp in 2030.²⁴

We've now gone from the "duck curve" to the "canyon"

May 27
2018

April 16
2023





Anticipated Issues over the Next Decade

Increasing renewables penetration

- Increased curtailment
- Steeper ramps → reliability challenge
- Increased reliance on intermittent, use-limited supply → reliability challenge

Increasing electrification of end uses (buildings, transportation)

- Increased cost of service due to higher load, if unmanaged

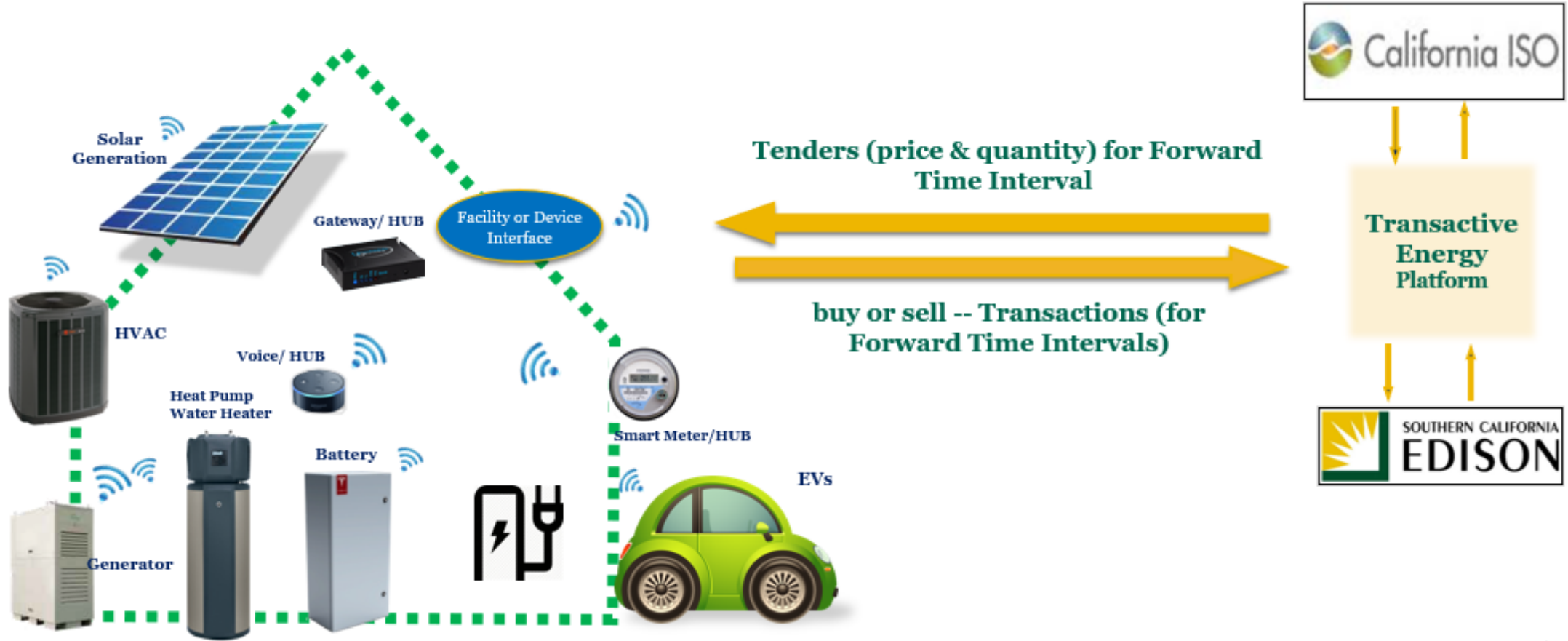
Increasing DER deployment

- Grid instability and increased cost of service, if unmanaged
- Fair compensation and cross-subsidy challenges



The SCE Dynamic Rate Pilot

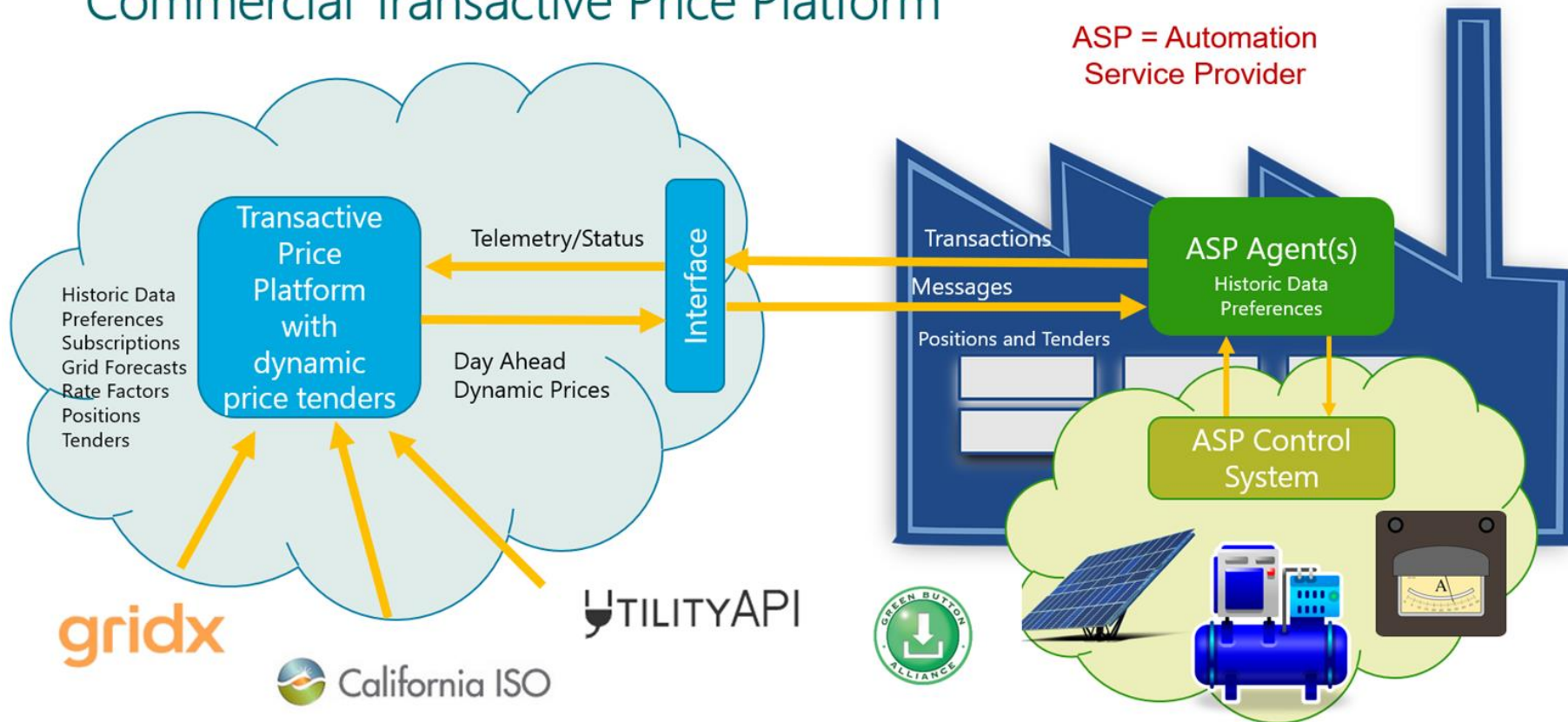
A new way to price electricity



Automated Service Providers

SCE is working with **automated service providers (ASPs)** that have existing SCE (bundled) customers available with installed communicating enabling technologies that are compatible with the TeMix software messaging platform.

Commercial Transactive Price Platform



SUSTAINABILITY

1393 PJ (1.32 quads) of efficiency

200 GW of peak flexibility

\$15B per year to US ratepayers

DOE's Roadmap for grid-integrated efficient buildings (GEB),

Schools // Public Buildings // Colleges // Warehouses

EQUITY

Simple, affordable tool for managing energy costs, GHG, and reliability..



Pictured: Jamboree Housing Community Engagement in Santa Ana, CA



Pictured: Sonora Elementary in Costa Mesa, CA



PROBLEM

Existing solutions are too expensive, too complex and create nearly as many problems as they solve for the 90% who don't use controls.



KIM

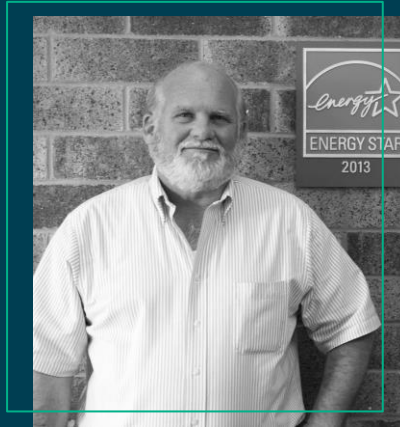
District Superintendent

↓ CAPEX

1 million ft.²

\$3M energy bill

Net Zero by 2025



GLENN

Facilities Manager

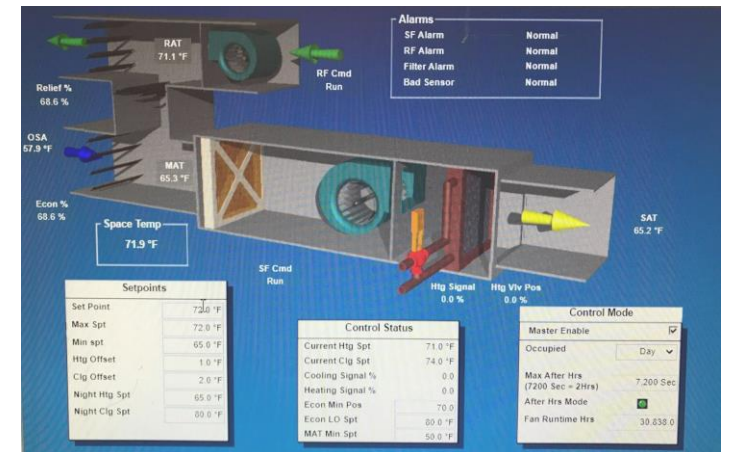
4-20 buildings

1-3 staff

↑ backlog

↑ CAPEX \$3MM

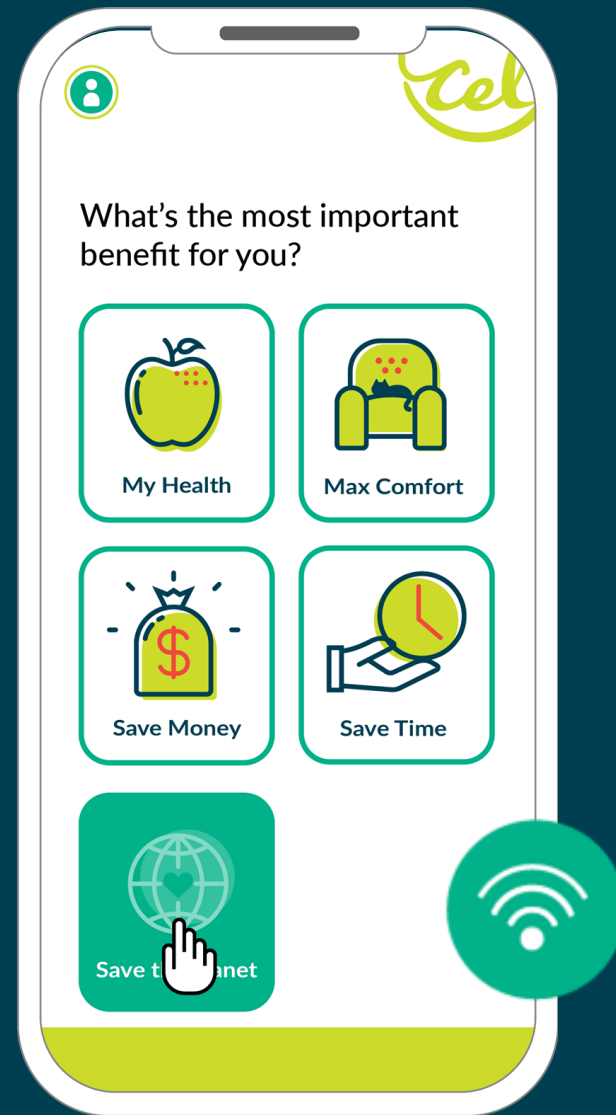
→ CARBON



SOLUTION

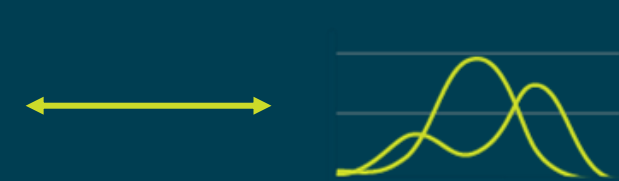
CEL is an IoT & Software as a Service control platform for building operators who find it complex, frustrating and very expensive to meet long term building energy mandates using standard building control options.

- // Simple & intuitive
- // Single-day installation
- // Autonomous control
- // Future ready & Scalable
- // Works with solar & battery



CUSTOMER BENEFITS

- COST SAVINGS OF 5-25%
- GHG REDUCTION
- REGULATIONS COMPLIANCE
- LOW BARRIER CAPEX <\$20k
- ROI IN UNDER 2 MONTHS



Hands-off Peak Load Shifting

PILOT PROCESS & RESULTS



1

CHOOSE

- // Smart T-Stat
- // BACnet over IP



2

SETUP &
INSTALL

- // Audit ½ - 1 day
- // Install ½ - 1 day



3

TURN ON THE
SYSTEM

- // Pilot pays for 1 year
- // Then \$.06-.10 sq ft/yr



4

TESTING
CAMPAIGNS

- // 20-40% Demand Charge Reduction
- // Comfort Rules

PROCESS



GATHER.

CEL's friendly team gathers your building data.



TRAIN.

We train your virtual engineer to your specific needs based on findings from your data.



GO!

After six full days of training, your virtual engineer is ready to work!

COOL BEFORE

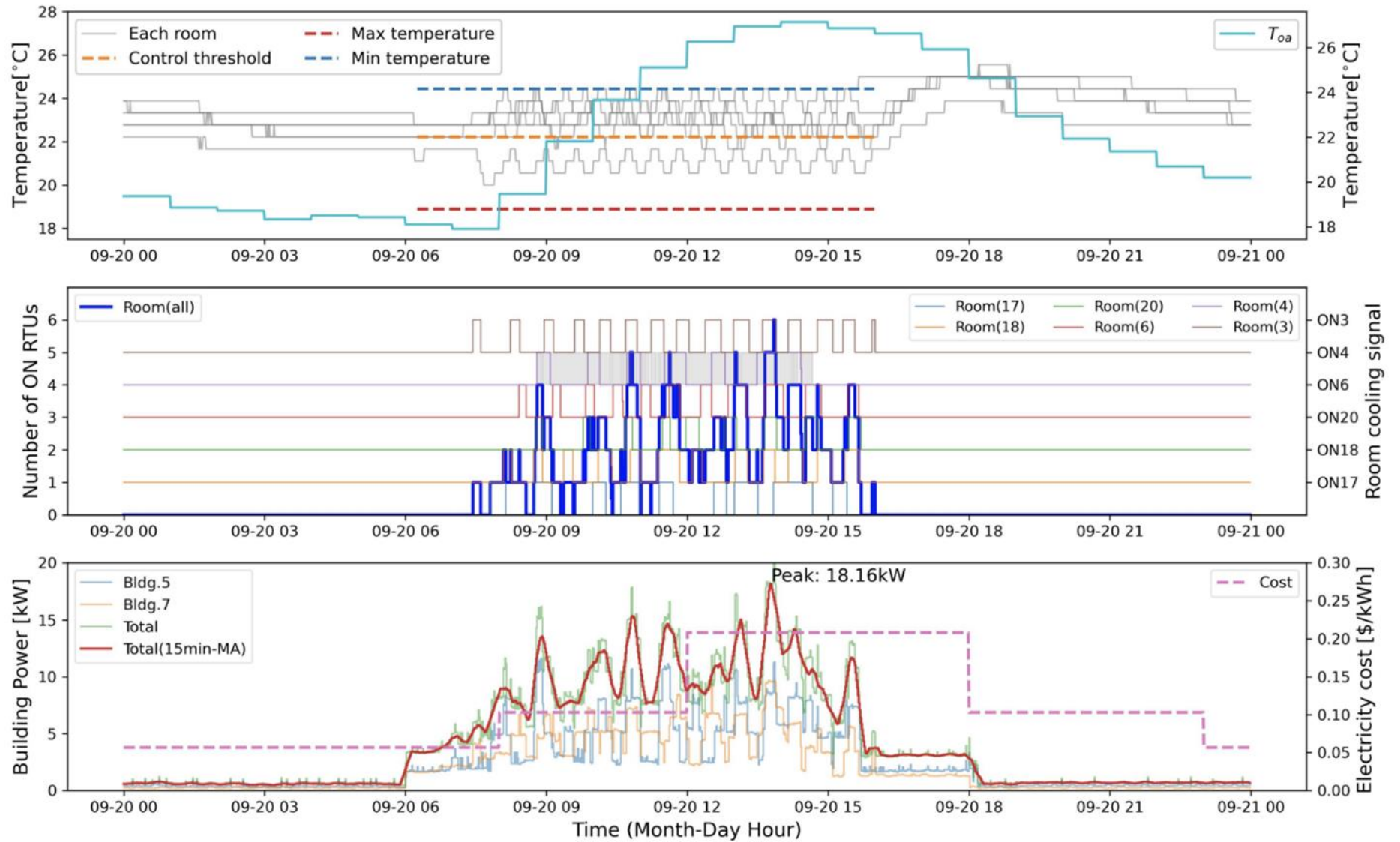


Figure 12: Summary of RTU operation in a default schedule day (Baseline); top: room temperatures with min/max comfort boundary (thermostat deadband adjusted setpoints) and outdoor air temperature, middle: RTU signals and override period (grayed area), bottom: building power and electricity price signal.



COOL AFTER

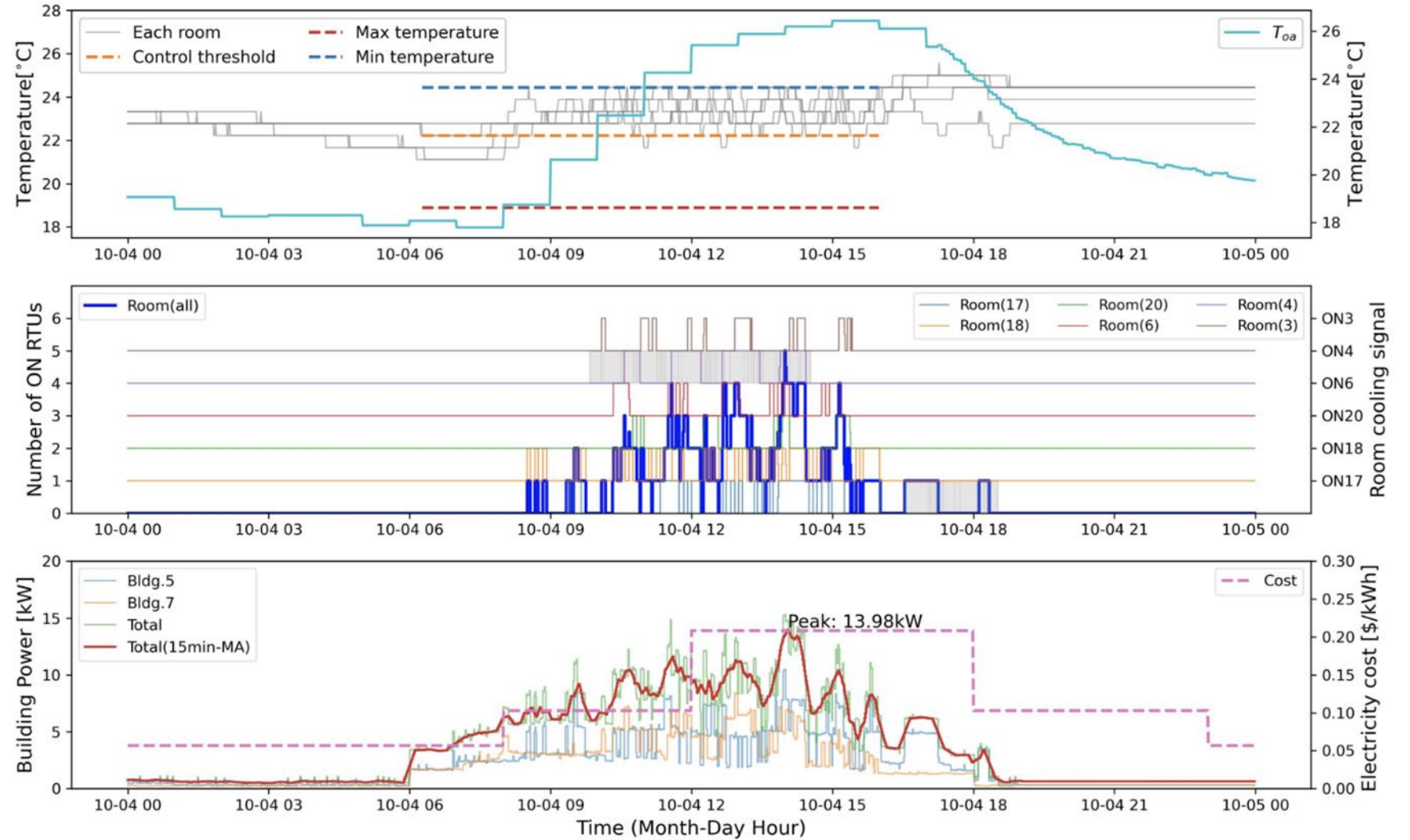


Figure 13: Summary of RTU operation in an MPC day (MPC); top: room temperatures with min/max comfort boundary (thermostat deadband is included) and outdoor air temperature; middle: RTU signals and override period (grayed area), bottom: building power and electricity price signal.



COOL SHIFT

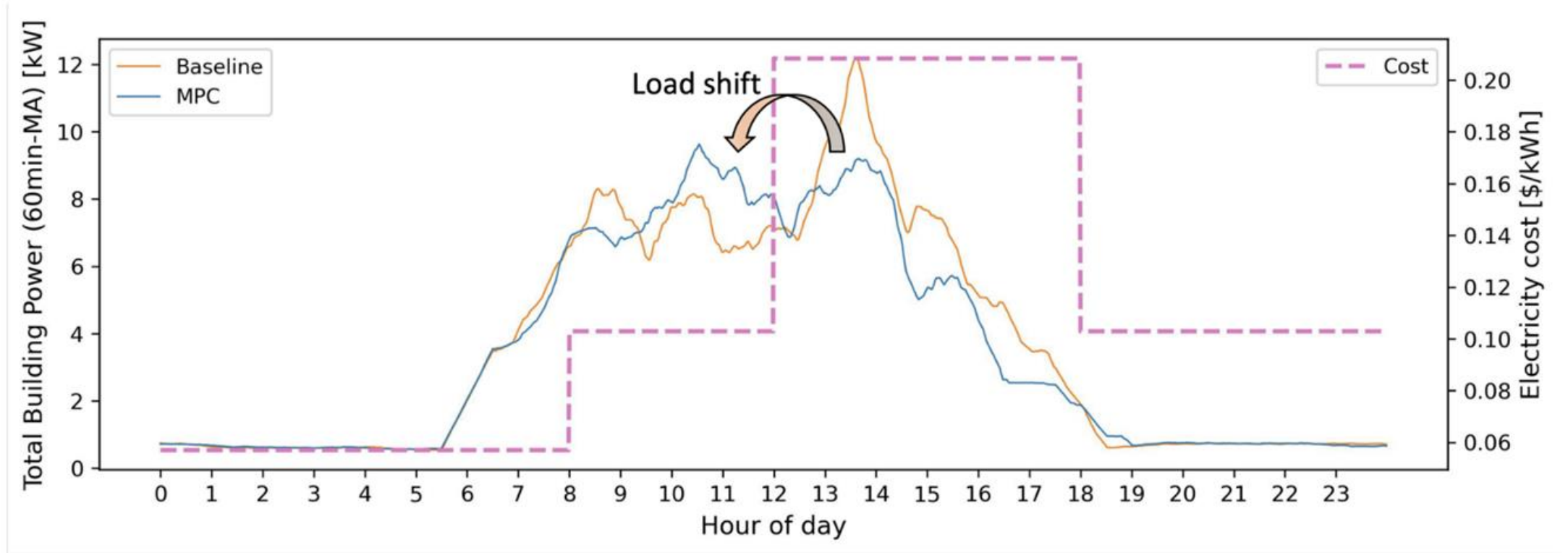
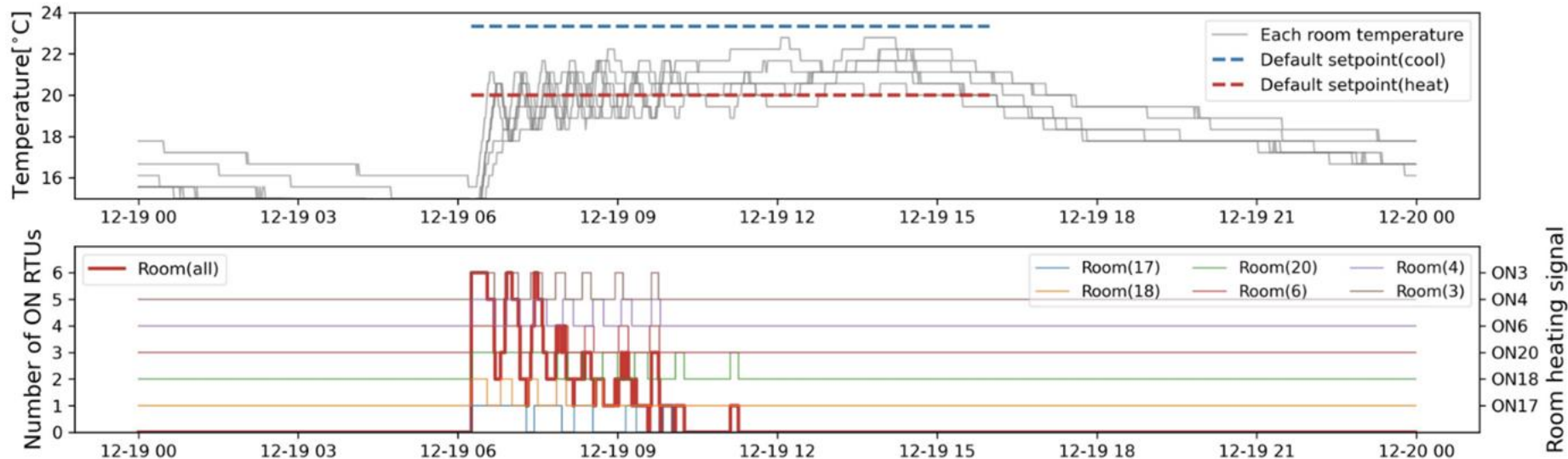


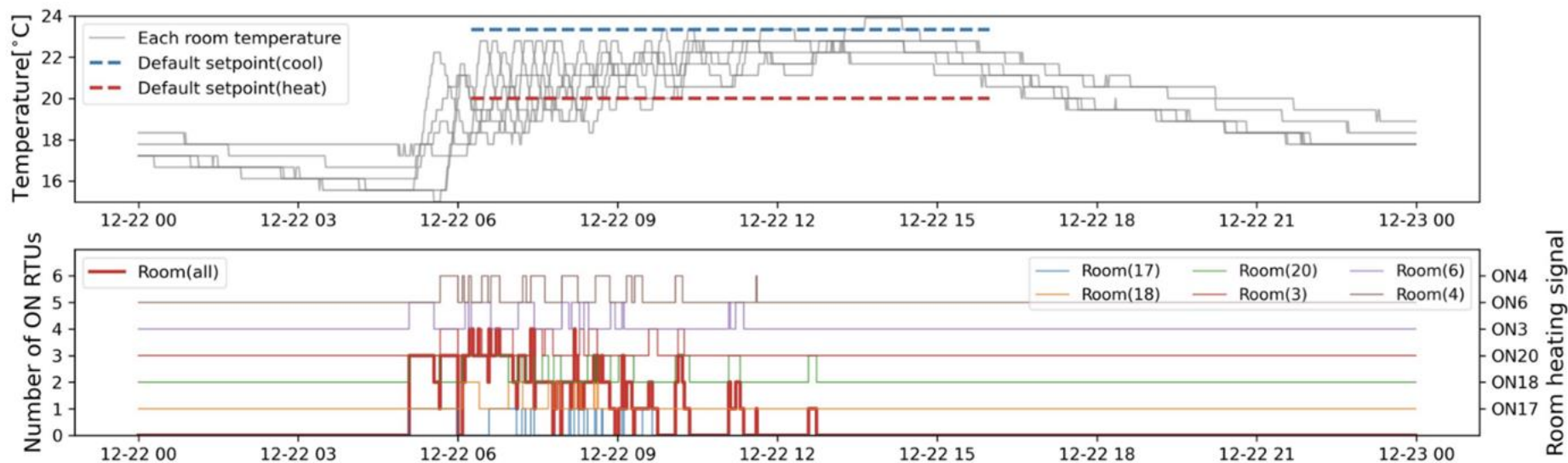
Figure 17: Comparison between the load profiles in a Baseline and an MPC day with the utility tariff



HEAT



(a) Heating operation (Baseline)



(b) Heating operation (MPC)



Thank You!

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