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 AND THE BANATAO INSTITUTE

ACEEE

becc
behavior, energy & climate change

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

California's renewable policies and system consequences

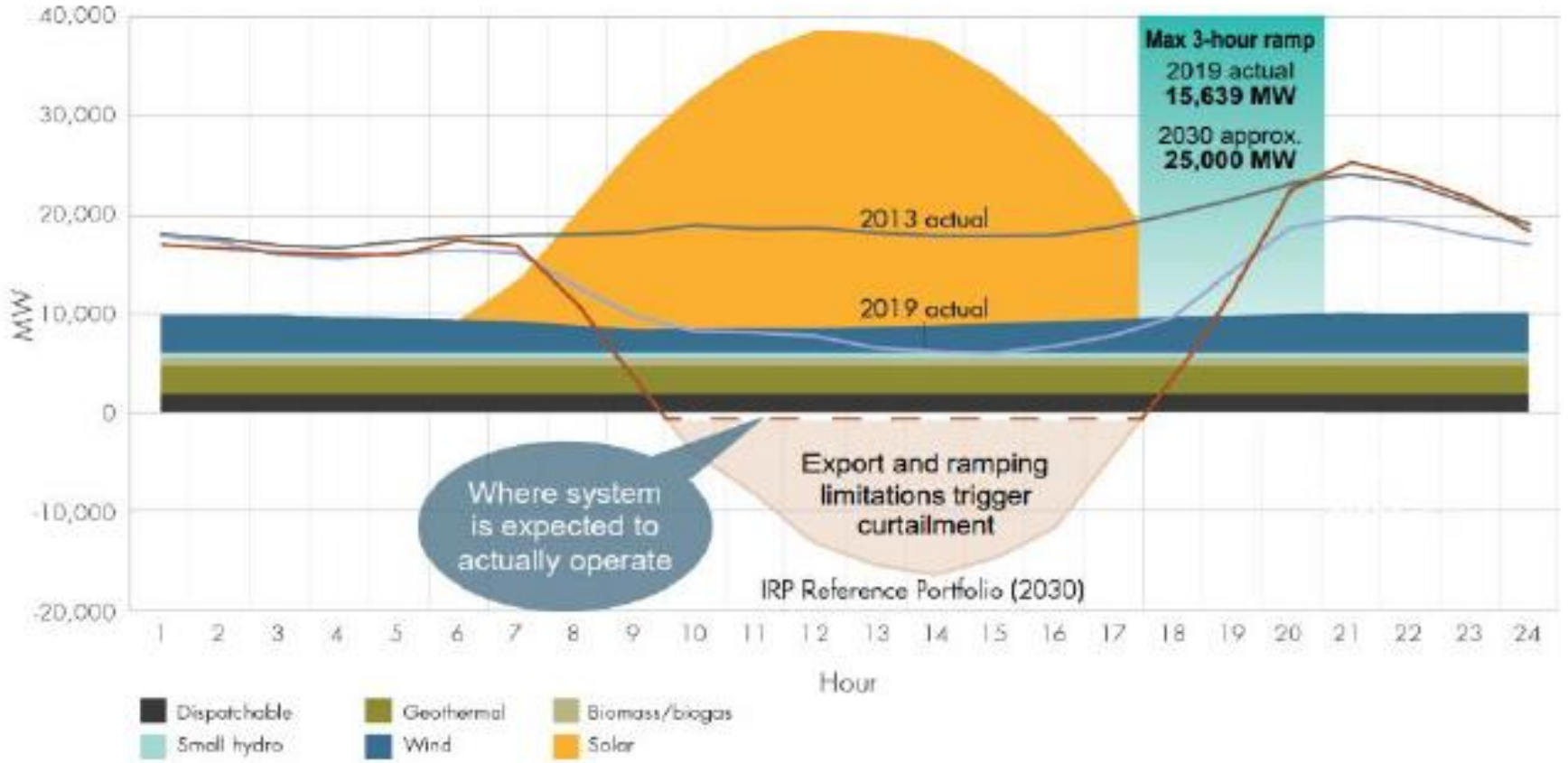

Figure 3-2: CAISO's outlook for projected curtailment and max 3-hour system ramp in 2030.[24]

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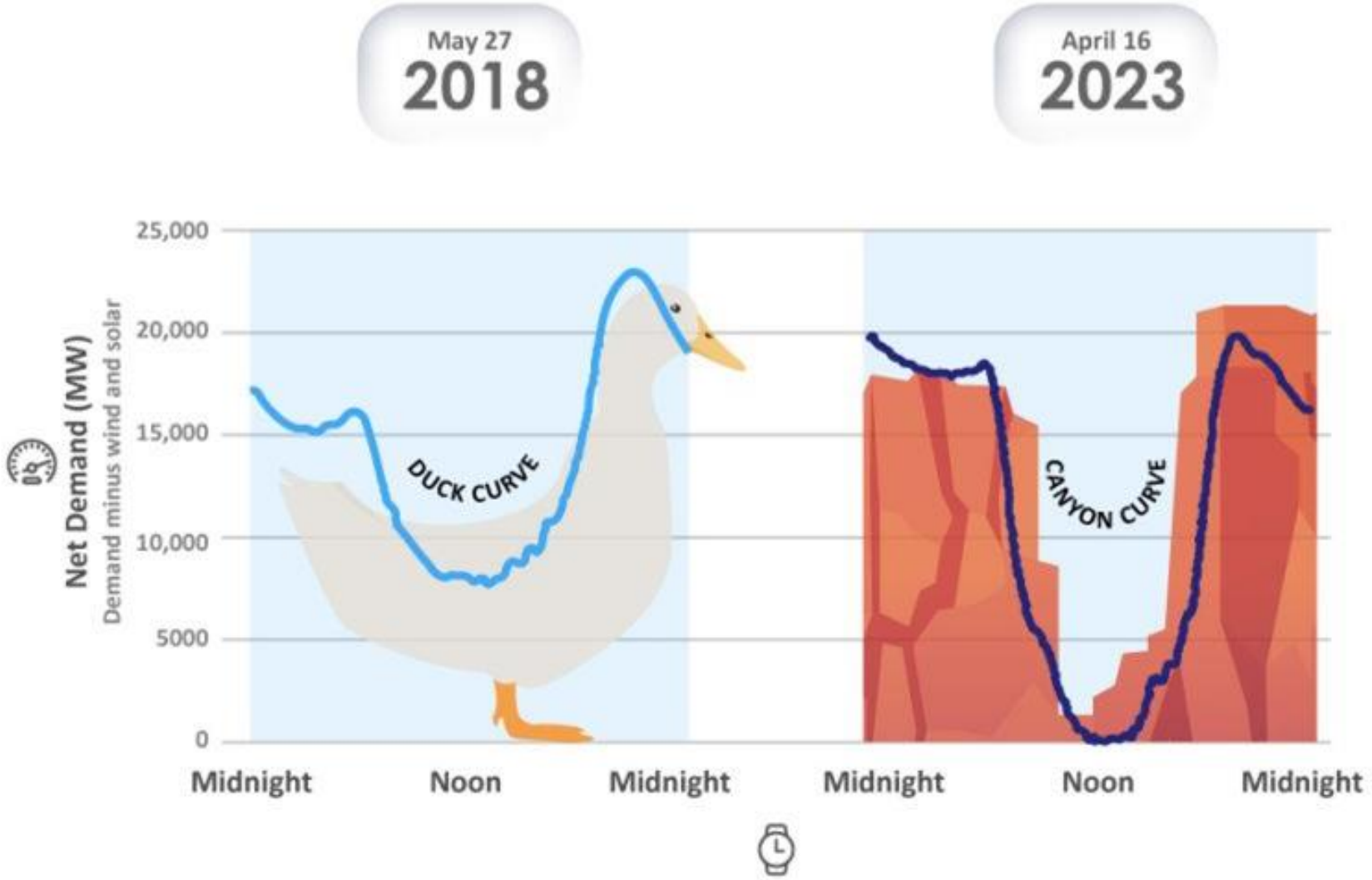
We've now gone from the "duck curve" to the "canyon"



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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)

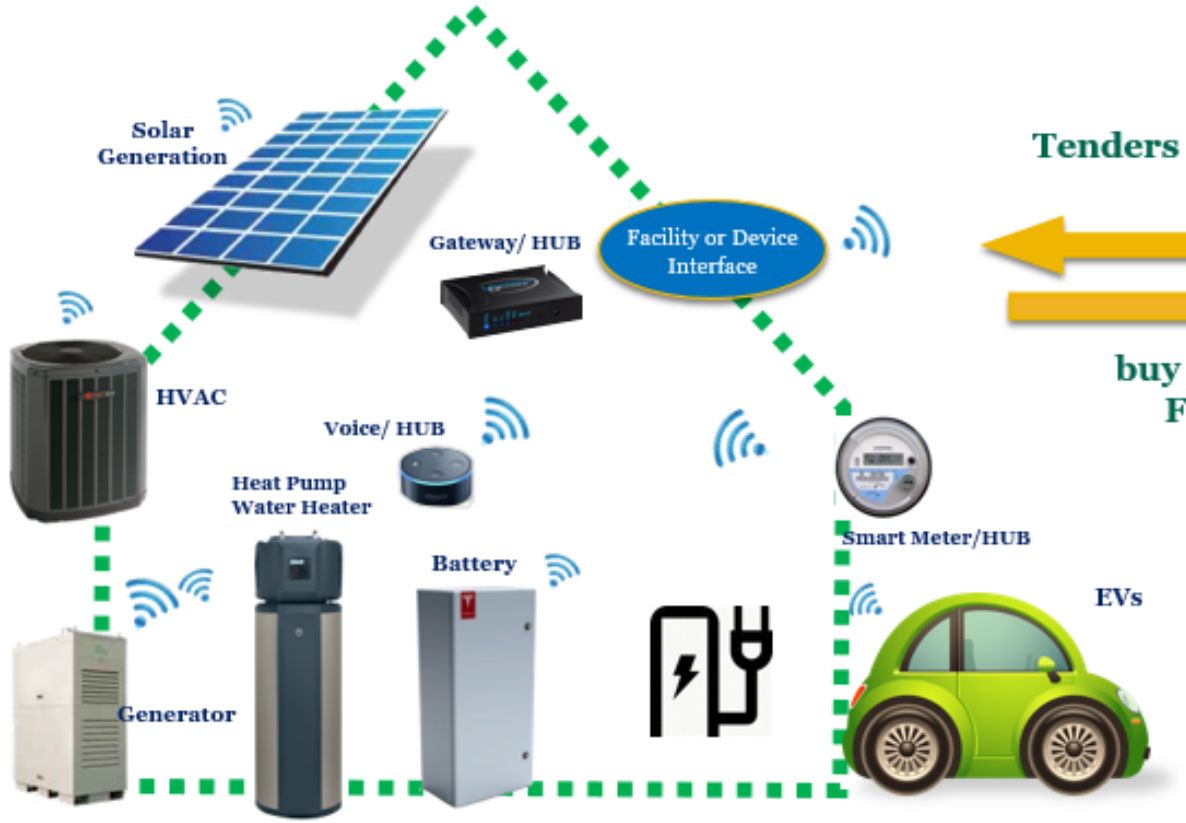
- Increased cost of service due to higher load, if unmanaged

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



Tenders (price & quantity) for Forward Time Interval

buy or sell -- Transactions (for Forward Time Intervals)

California ISO

Transactive Energy Platform

SOUTHERN CALIFORNIA EDISON

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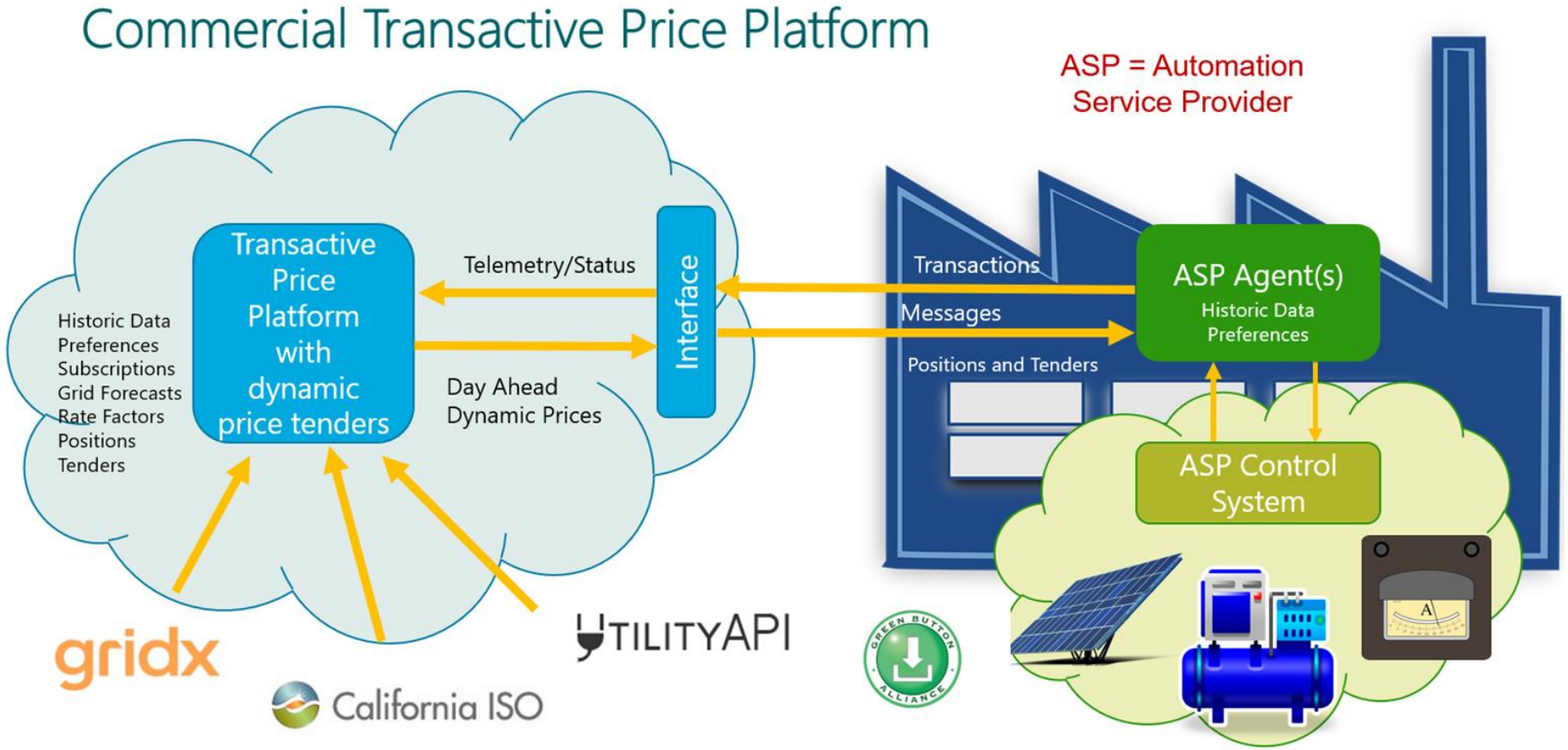
Automated Service Providers

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.



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


Spin

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

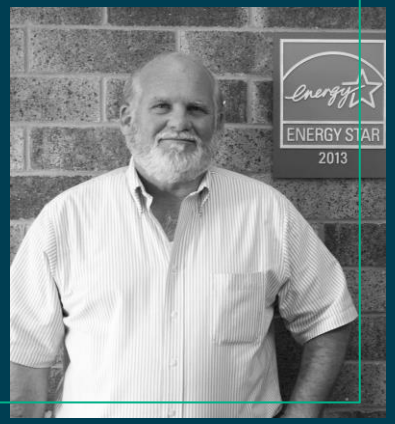
District Superintendent

⇩ CAPEX

1 million ft.^{2}

$3M energy bill

Net Zero by 2025



GLENN

Facilities Manager

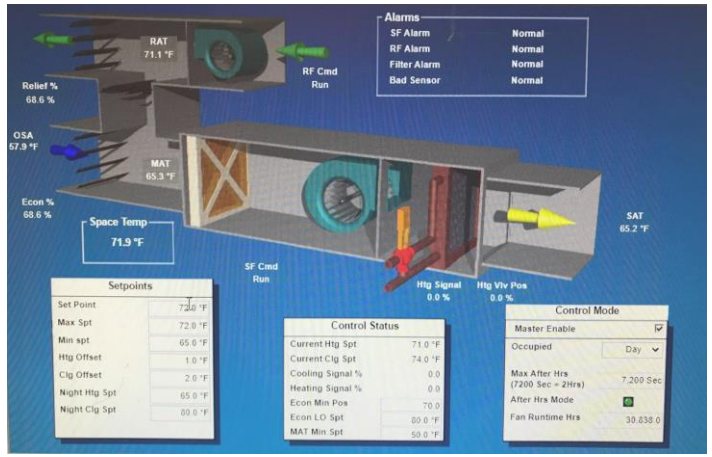
4-20 buildings

1-3 staff

⇧ backlog

↑ CAPEX $3MM

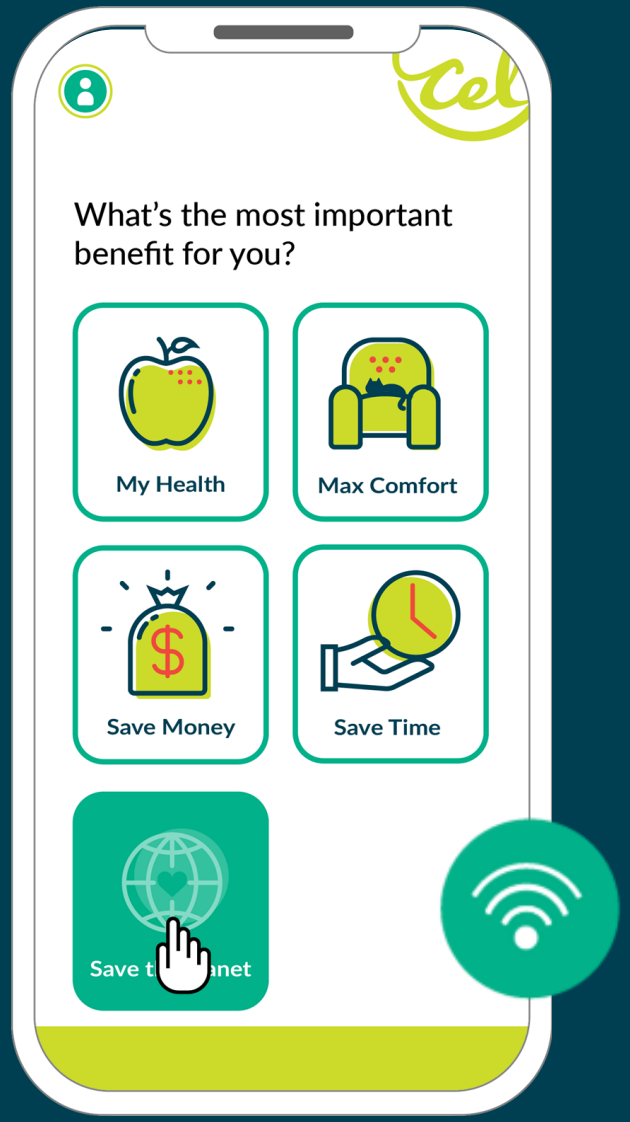
→ CARBON



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

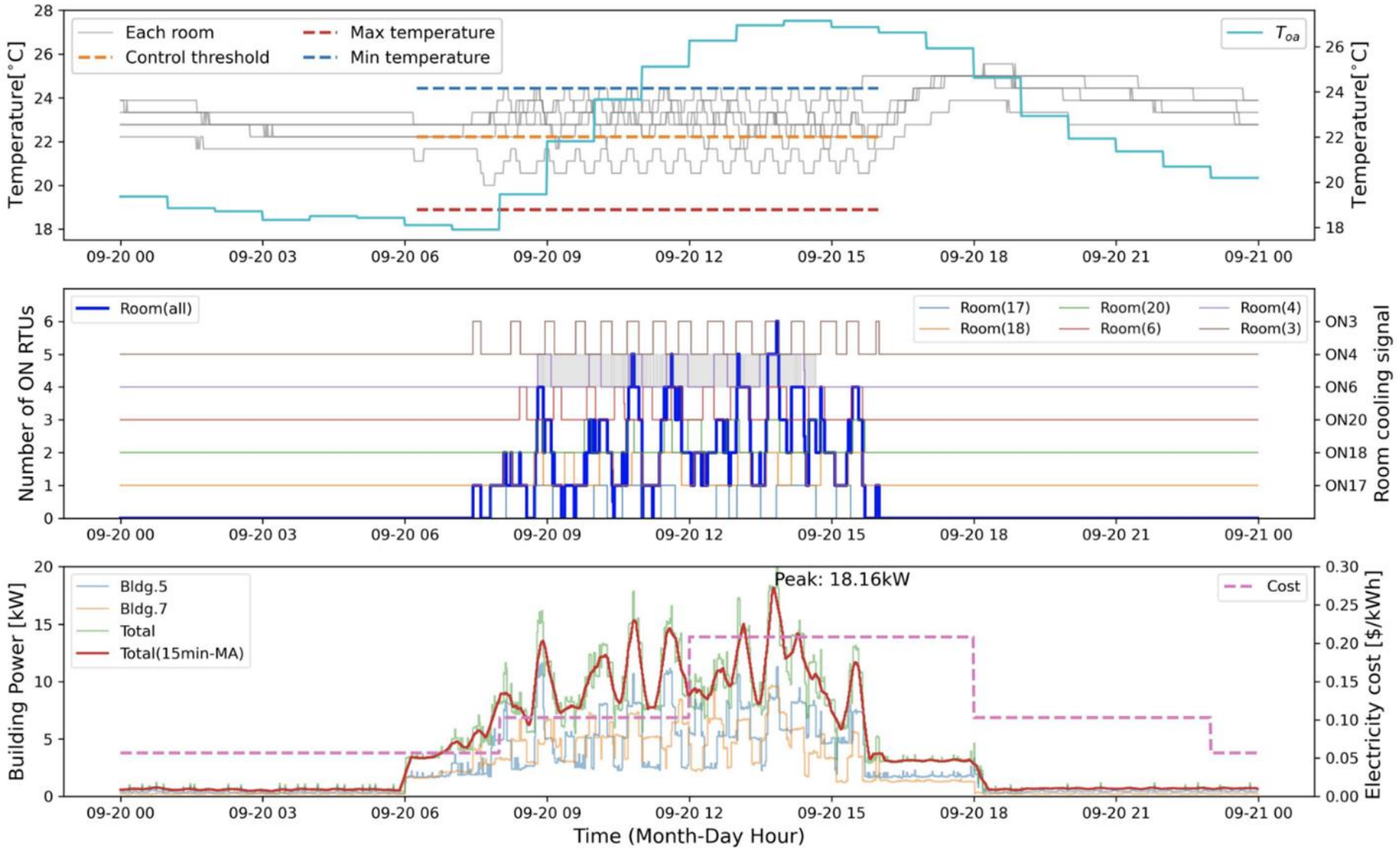


Figure 12: Summary of RTU operation in a default schedule day (Baseline); top: room temperatures with min/max comfort boundary (thermostat deadband adjusted setpoints) and outdoor air temperature, middle: RTU signals and override period (grayed area), bottom: building power and electricity price signal.

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COOL
AFTER

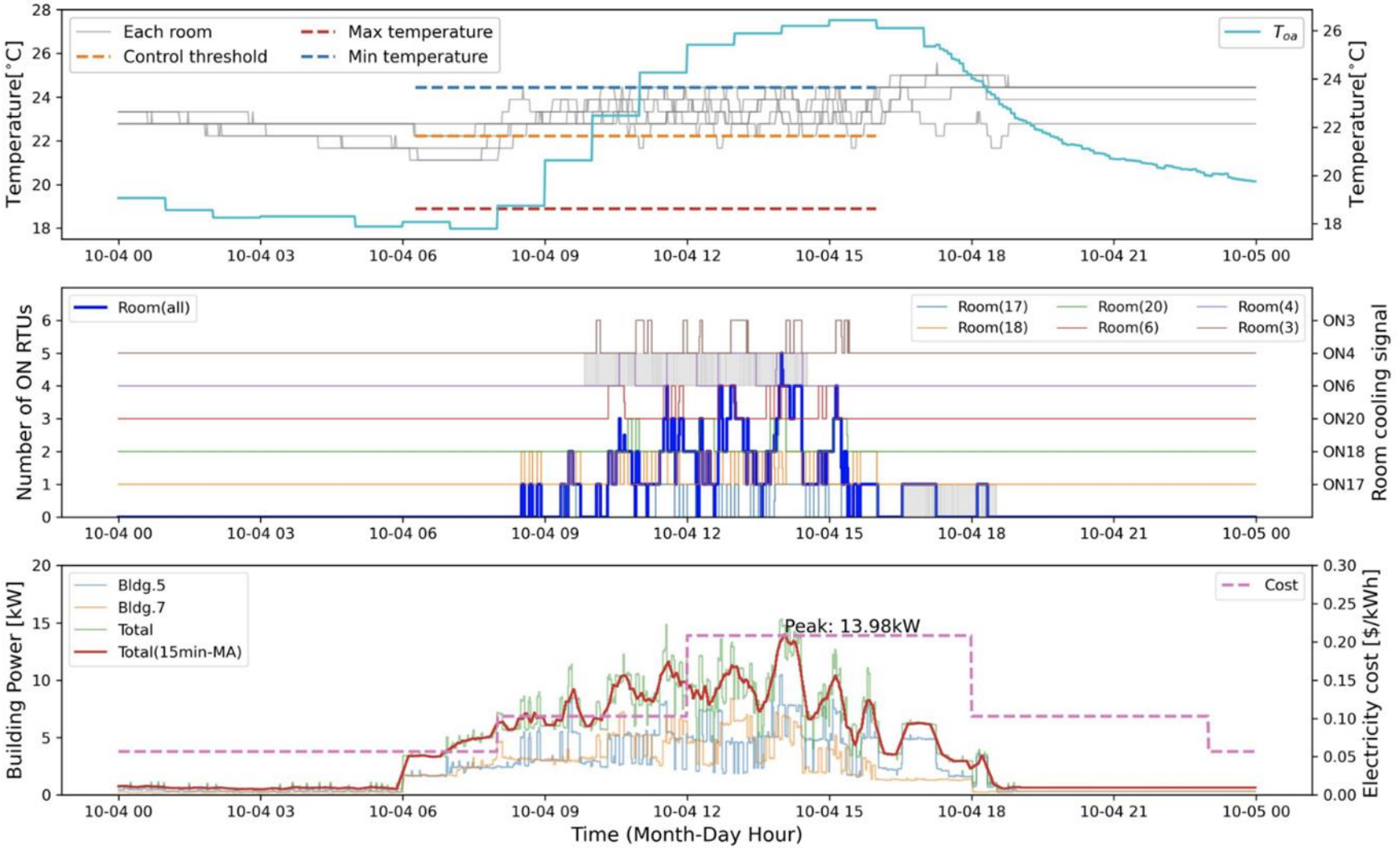


Figure 13: Summary of RTU operation in an MPC day (MPC); top: room temperatures with min/max comfort boundary (thermostat deadband is included) and outdoor air temperature, middle: RTU signals and override period (grayed area), bottom: building power and electricity price signal.

COOL
SHIFT

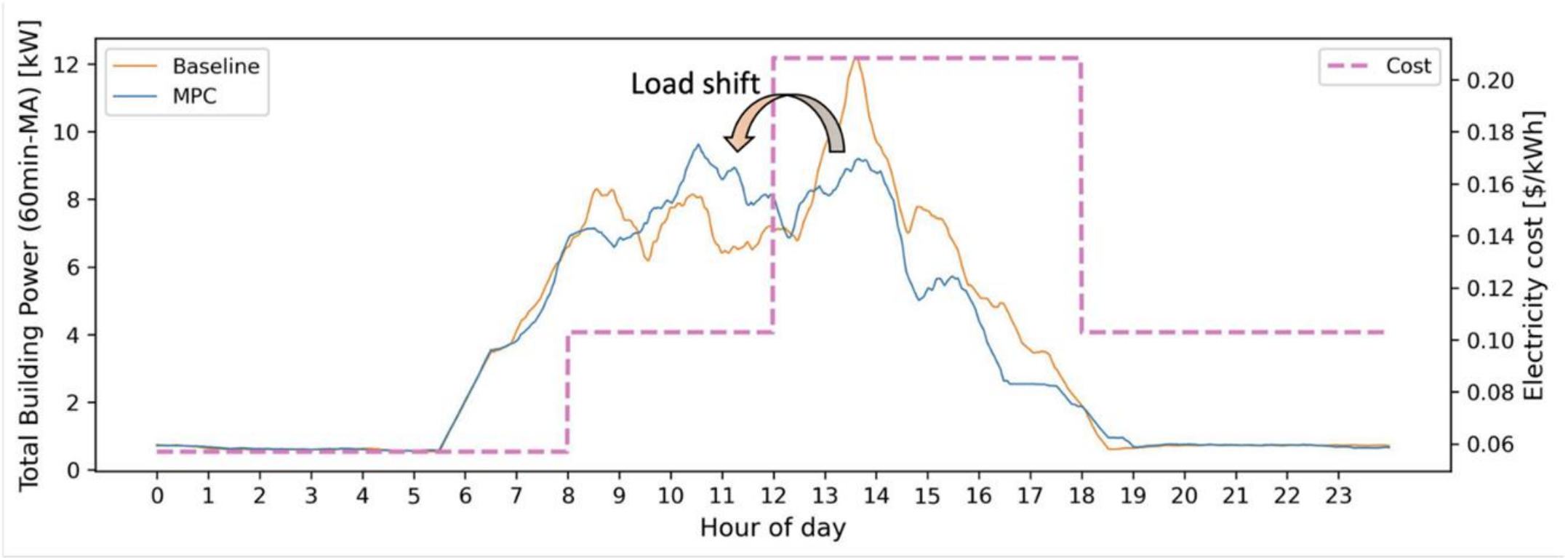
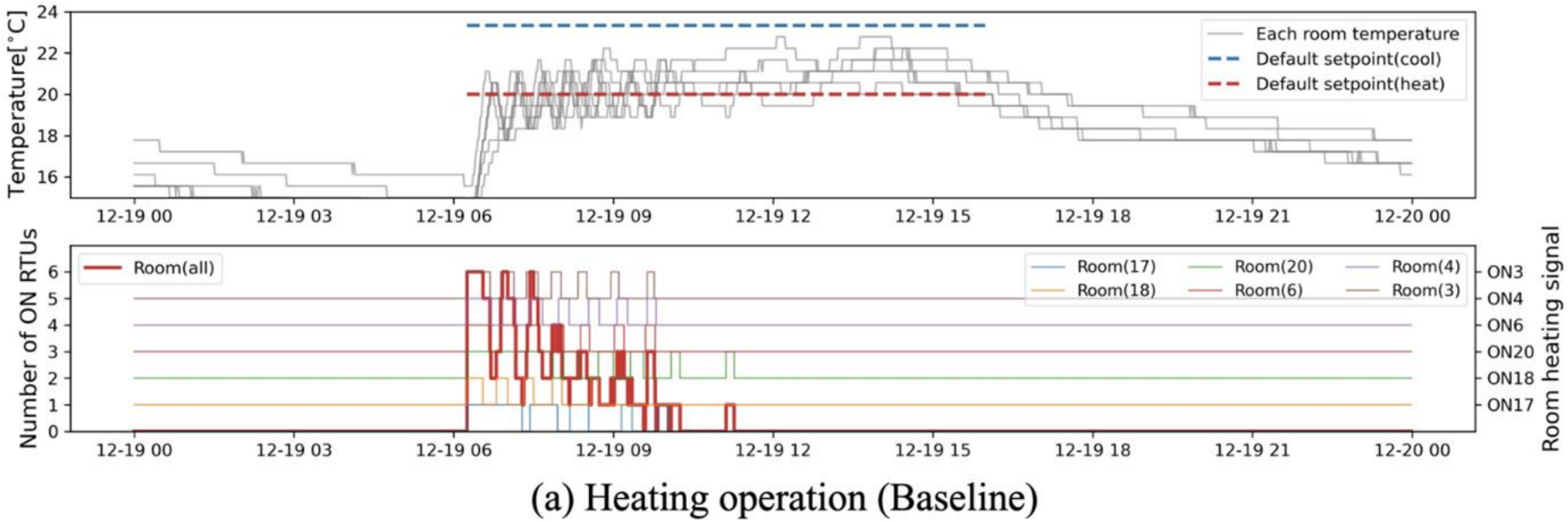
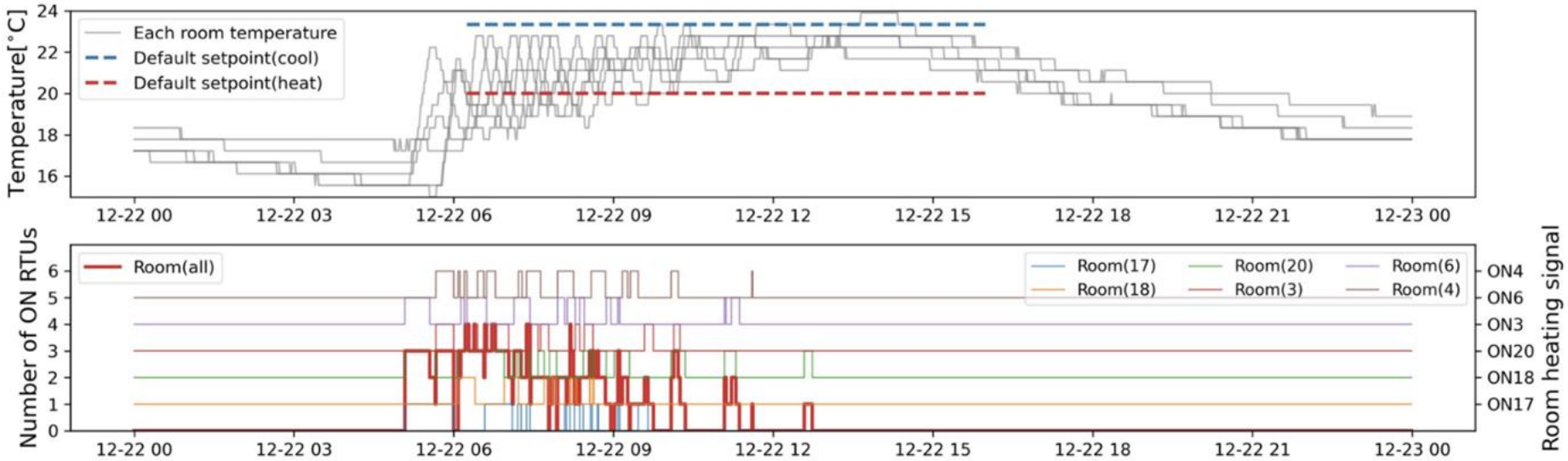


Figure 17: Comparison between the load profiles in a Baseline and an MPC day with the utility tarrif

HEAT



(a) Heating operation (Baseline)



(b) Heating operation (MPC)

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Thank You!

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