

Residential Market Advisory Group

Membership Showcase

August 19, 2021



Residential Market Advisory Group

- **The RMAG's mission is to bring together residential market actors to envision the next generation of residential clean energy solutions and to facilitate deployment of strategies that stimulate market growth, deliver customer value, and enable achievement of New York State's energy policy goals.**
- **It provides a forum for the residential market that advances collaboration among stakeholders and enables the market to provide input to NYSERDA.**

Agenda

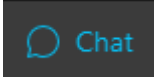
1:00-1:45

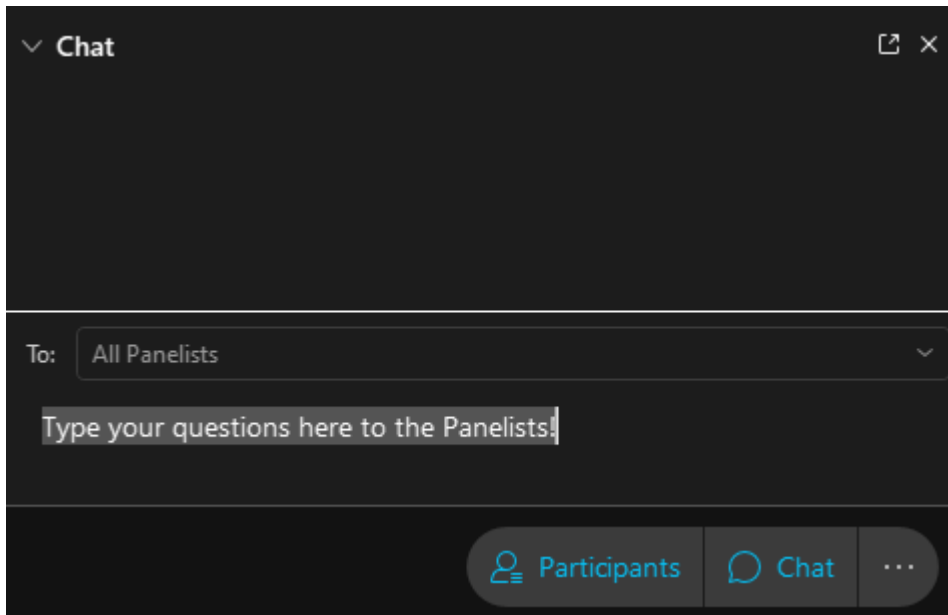
- Presentation by Copper Labs
 - Enhancing home improvements with wireless real-time electric and natural gas monitoring.


1:45-2:30

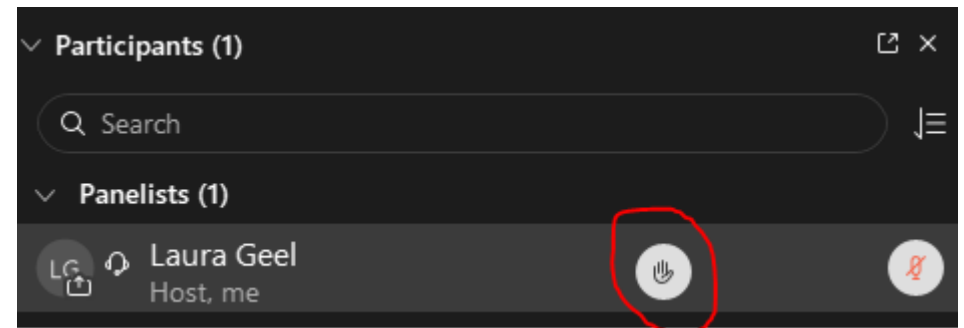
- Presentation by HubControls
 - Learn how the HubController® Automatic Energy Management System takes the pain out of decarbonizing the heating and cooling of family homes.

Audience Participation

At any time, type in a question to “All Panelists” using the Chat Feature 



During Q&A, you can “Raise Your Hand” to be unmuted and ask your question. 



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copper

Wireless Real-Time Energy Management

Eric Van Orden

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copperlabs.com/demo-video



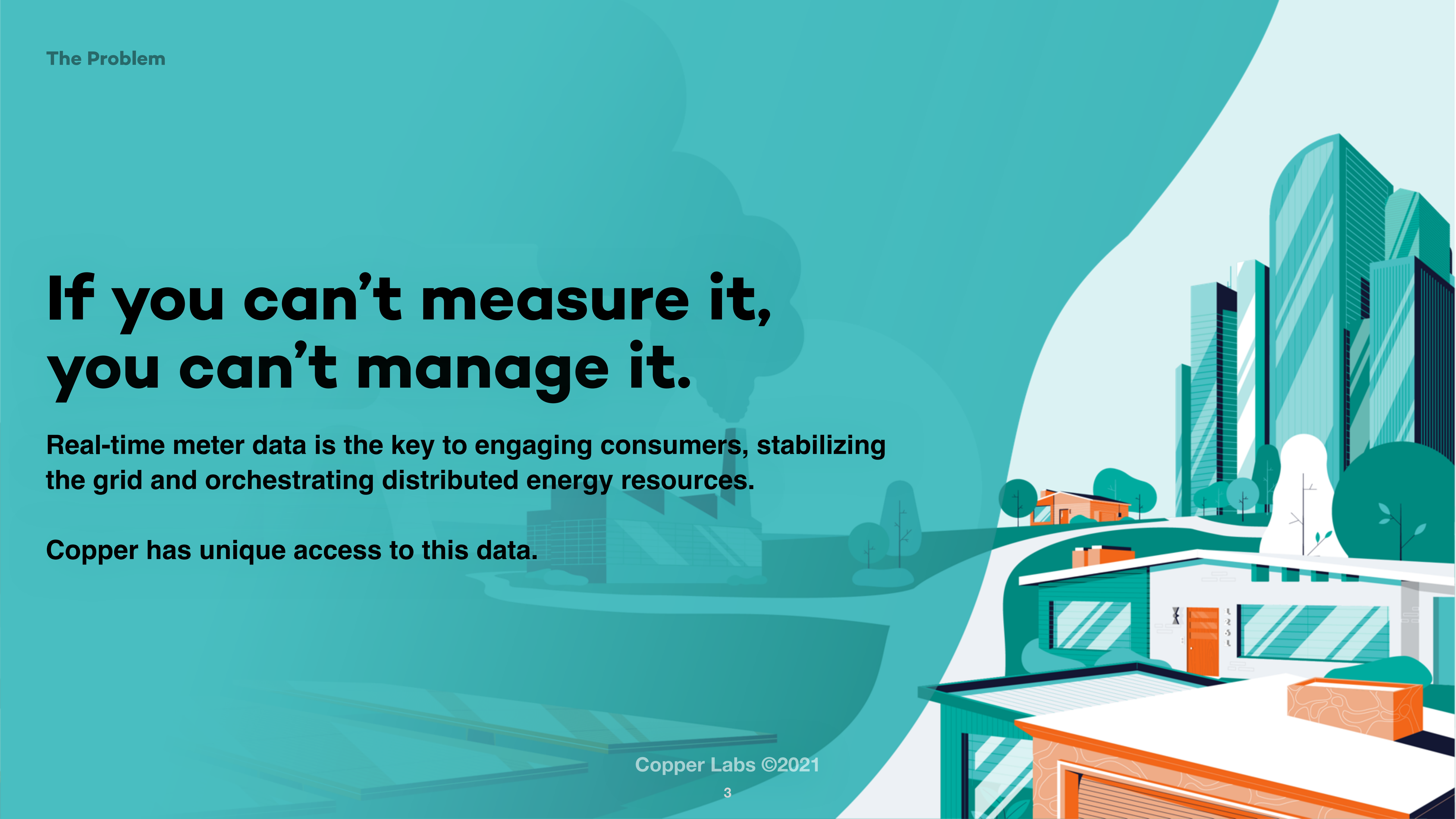
Constant challenges to provide safe, reliable, affordable and clean energy.



If you can't measure it, you can't manage it.

Real-time meter data is the key to engaging consumers, stabilizing the grid and orchestrating distributed energy resources.

Copper has unique access to this data.



Residential demand response capacity will more than triple in the next decade with increasing distributed energy resources

Global Residential Demand Response Capacity:

13.8 GW → **47.4 GW**
2019 2028

North American Distributed Energy Resources:

46% of capacity from residential DER
28% of capacity from EV charging



The Time and Location in Which Energy is Used is Increasingly Important

Real-time grid edge intelligence is required to manage an increasingly distributed and decarbonized grid.

Traditional, centralized power grids were built to manage one-way power flow.

Distributed, two-way grids require real-time energy management and control.

Decarbonization and decentralization are disrupting the utility industry.

Copper is the only solution that delivers real-time electric, gas and water meter data, with or without smart meters.

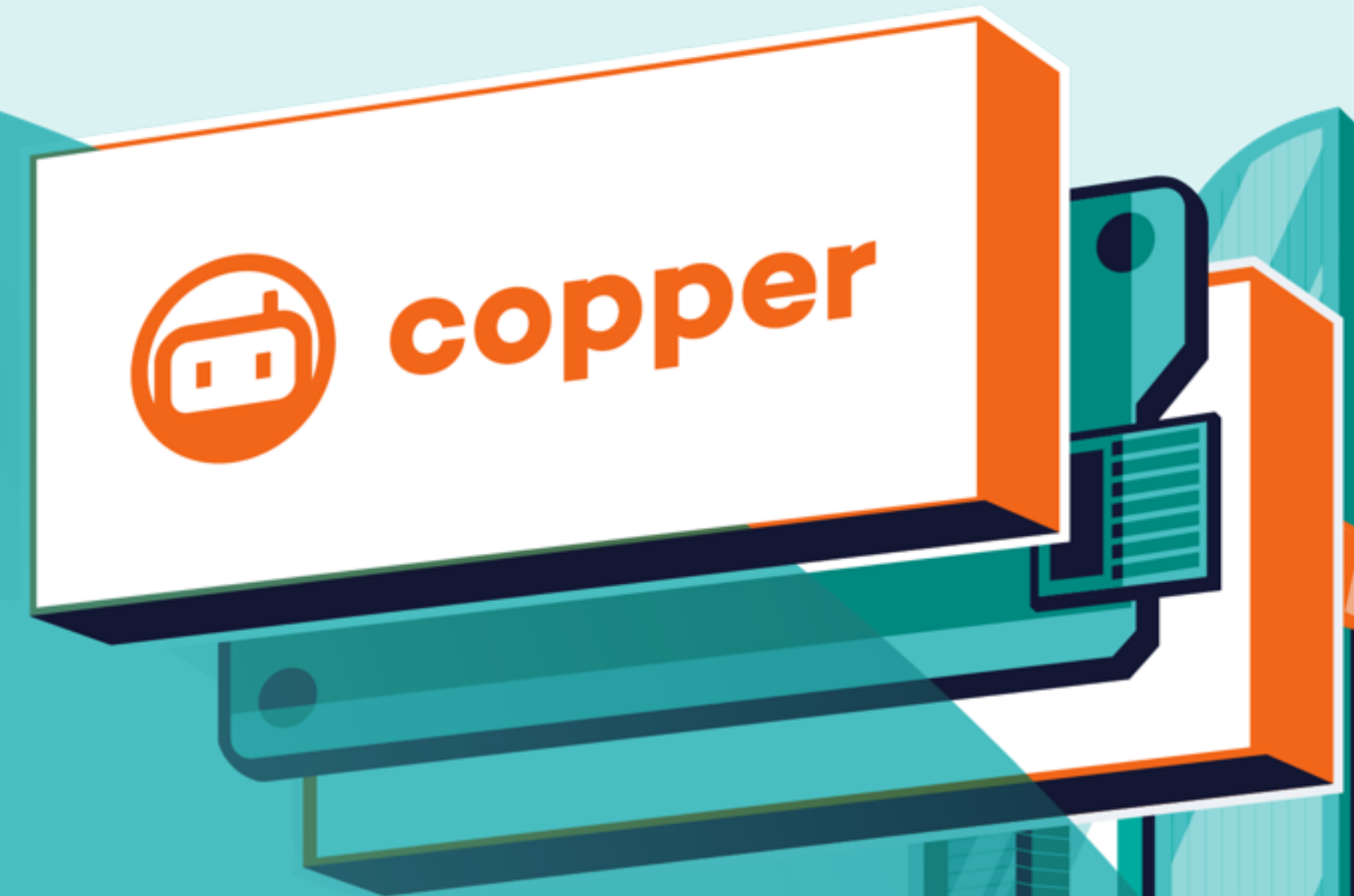
Only With Copper:

Utility Data Access: 30-second interval

Consumer Data Access: 30-second interval

Customer Engagement: targeted, real-time

Grid Edge Intelligence: real-time voltage and frequency



Built for Consumers

Copper was designed to be set up by a consumer in less than 5 minutes.

Distributed as energy audit leave-behinds, direct installs, marketplaces, new construction, and more



Real-time electric & natural gas meter data for demand management and more

nationalgrid



National Grid selected Copper to reduce peak demand through customer engagement and targeted notifications, while also using interval data to measure & verify smart t-stat program savings.

Guidehouse



Guidehouse is working with Copper Labs to provide electric and natural gas data from multiple utilities to help regulators and stakeholders understand load profiles for capacity planning, model the impact of electrification, identify the amount of energy usage by major appliances, and more.

Real-time electric & natural gas meter data for demand management and more



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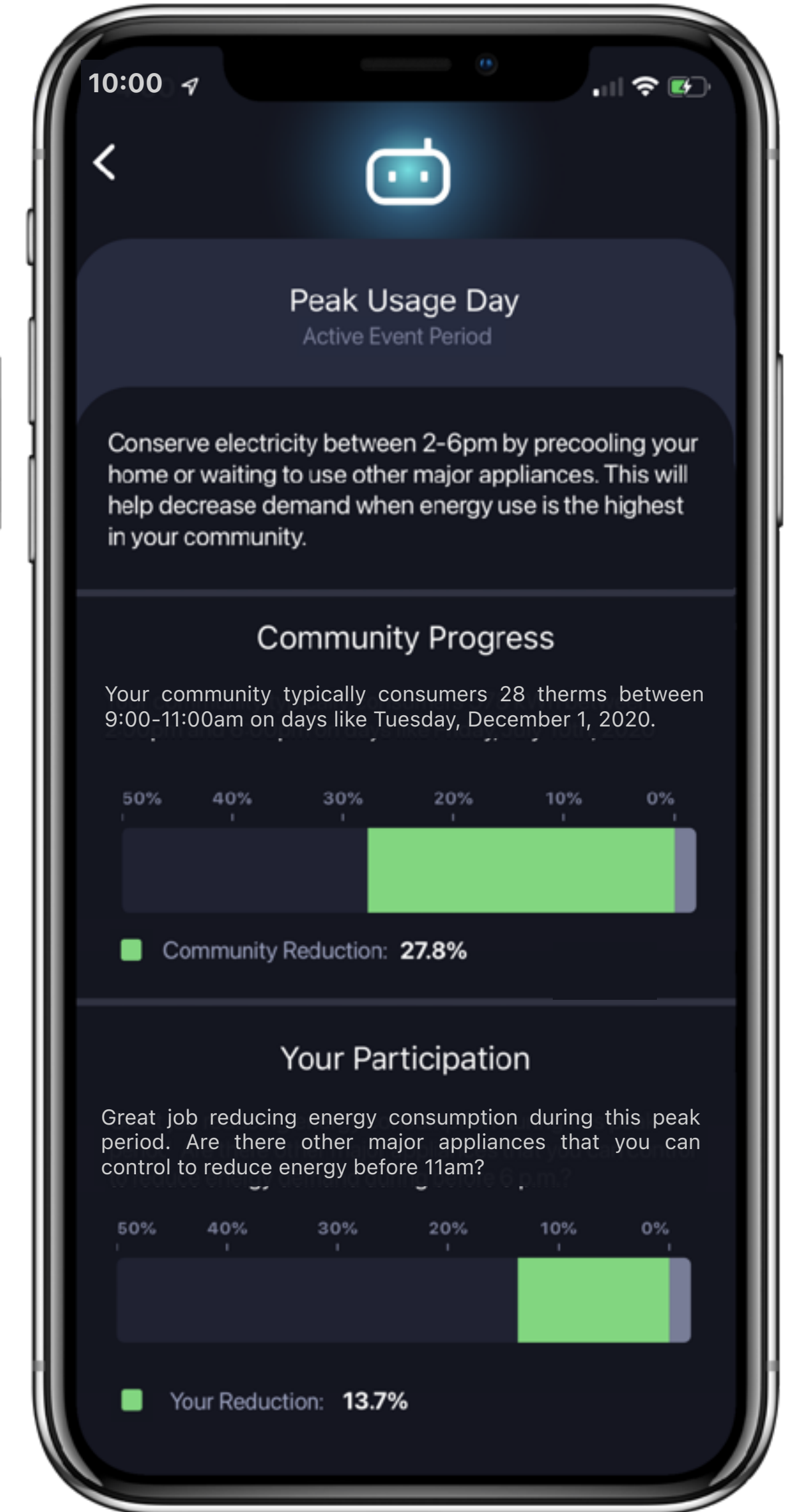
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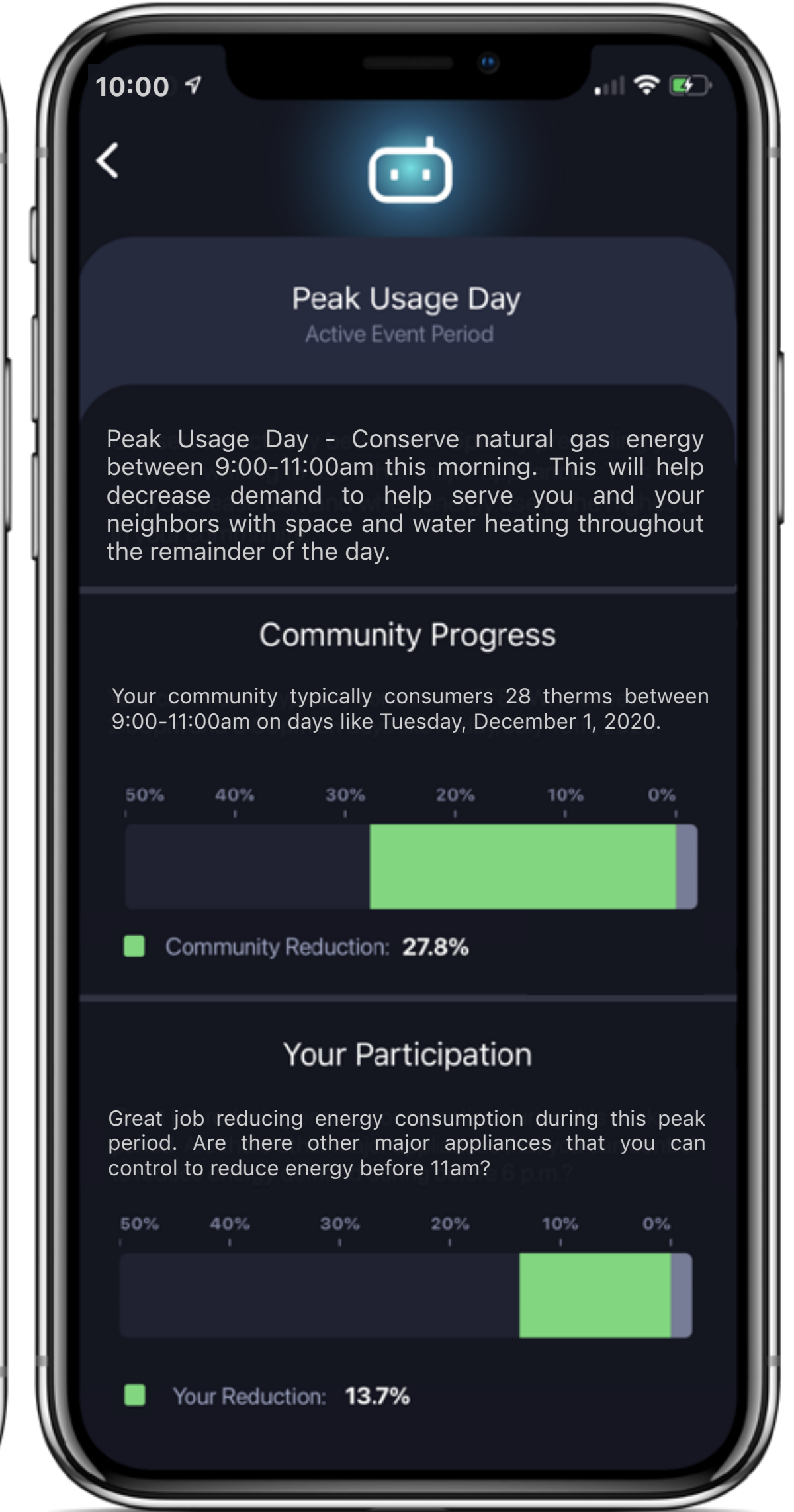
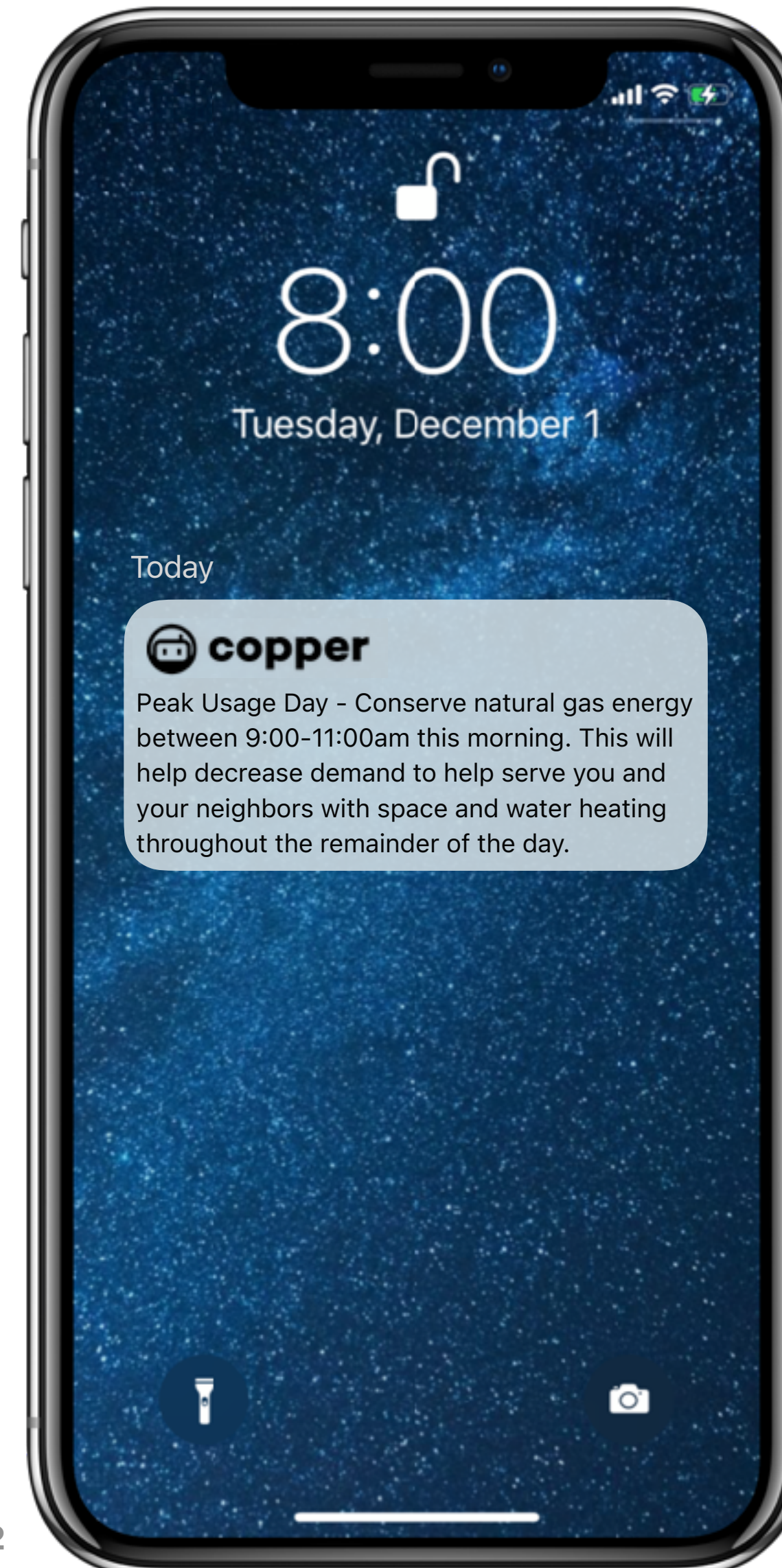
copperlabs.com/demo-video

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Real-time Data, Relevant Energy Tips, Behavioral DR Gamification



Real-time Data, Relevant Energy Tips, Behavioral DR Gamification



The HubController®

Automatic Energy Management System




HubControls®

World Problem: The Energy Transition & Consumer Inertia

The energy transition includes decarbonizing heating, a sector the World Economic Forum says accounts for more than 40% of global carbon emissions, with 13% coming from direct residential heating alone.

The big challenge and problem for decarbonizing heating is **consumer inertia**.

- Consumers find it difficult to understand the complexities of home heating.
- They don't immediately see the benefits from the energy transition.
- Their residential energy bills are steadily increasing.



The Challenge

The decarbonization of heating presents one of the most challenging aspects in achieving net zero.

The complexity of decarbonizing this sector is increased by the upfront fixed costs and the range of technology options, both in terms of the primary energy supply and the conversion available to support the transition. Additionally, while regional variations in adopted systems exist, the demands of heat vary across economic sectors, such as the supply of affordable warmth to residential customers and high-temperature industrial processes. Further complexity is created by the several variables involved, such as network infrastructure needed to transport the energy vectors, and building efficiency necessary to achieve comfort.

Home heating represents a significant share of overall international final energy demand (final energy describes the energy consumed by end users and neglects delivery and transformation). For example, approximately 25% of final energy consumption in the EU is attributed to residential demand, and residential energy use is responsible for 20% of greenhouse gas emissions in the US.¹ It is expected that there will be an

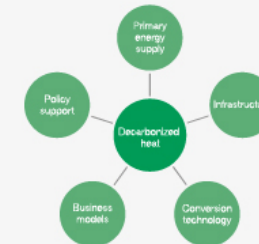
increasingly important role for heat in balancing increasing volumes of intermittent renewable electricity generation in net zero energy systems.

Achieving net zero will require major infrastructure and technology development, along with disruptive solutions, supporting policy and business models that have consumer acceptance and appeal.

It is unlikely, however, that there will be one winning technology, which increases the difficulty of setting clear policy to stimulate the market, therefore creating stagnation within the supply chain. There remains significant social, economic and political challenges, despite the advances made with technical innovation to date.

Collaboration between incumbent heating manufacturers and digital innovators will help to deliver business models, which transform the provision of heat, warmth and thermal comfort into a compelling and intuitive service proposition that captures the value of energy-as-a-service and distributes the associated benefits throughout the value chain.

Heat decarbonization has the potential to positively affect people's lives through more efficient, warmer and more comfortable homes and buildings ...



... but will require navigation through a complex web of interlinked components.

Technology options and key opportunities to decarbonize heating



Market penetration of low carbon heating technology must increase to 70% by 2030.



New York Problem: Residential Energy Reduction Targets v Actual Energy Use

Big Energy Reduction Targets

185 TBtu
end-use savings
in buildings and industrial sector
below forecasted energy use in 2025
by **2025**

Big Heating and Cooling Energy Use:

- ✓ HVAC consumes 40% of the energy used by residential and commercial buildings

Responsible for:

- ✓ 25% of the total energy used in NYS
- ✓ 36% of the GHG emissions in NYS

Cooling requirement for buildings

- ✓ the primary contributor to peak electric system demand (>32 GW) and average base-load system demand (<18 GW).

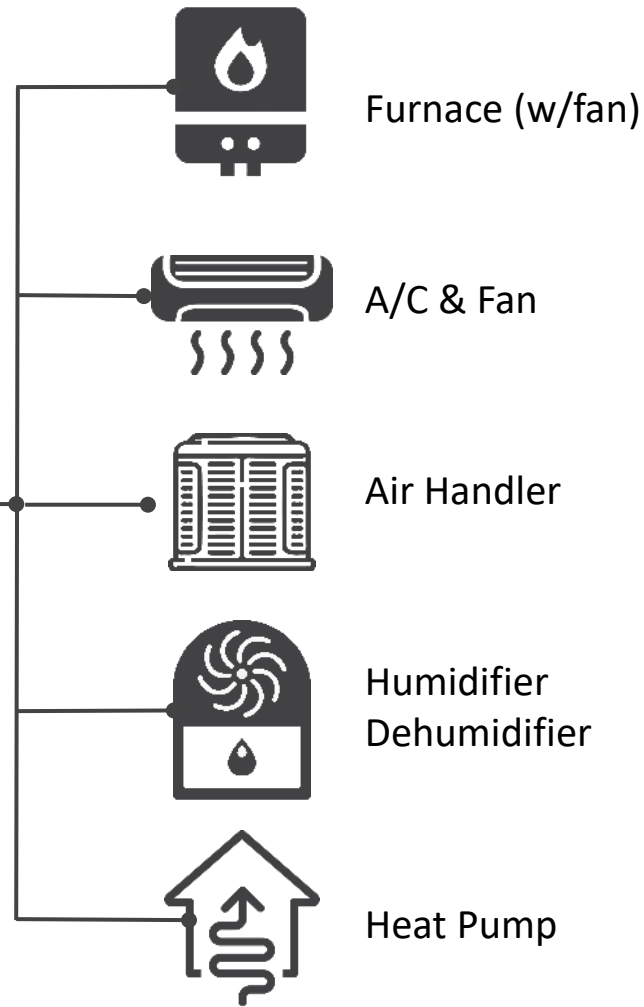


1 Part Smart Thermostat: Great Smart Control functionality for US Homes

Controls scheduling and temperature for all HVAC systems



Uses Wi-Fi & Bluetooth



- + **Customizable Screen**
so we can customize it for Partners marketing/ messages
- + **Over the air "OTA" Upgrades**
so we can add new features at any time
- + **IHD Functionality**
so we can display information to the customer in real time

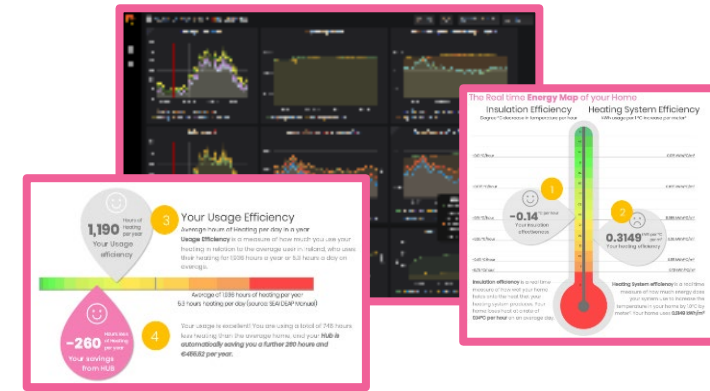


HubController®

Eliminating Energy Waste in the Home

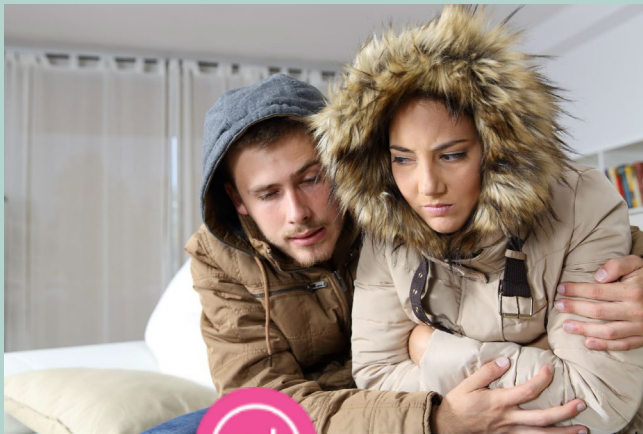
2 Part Smart Meter: Anonymized Real-Time Energy Use Data

- 175,200 home energy use Data Points are collected by the HubController® each year



We can tell you if...

...your home is poorly insulated...



...you could do with upgrading your heating system...



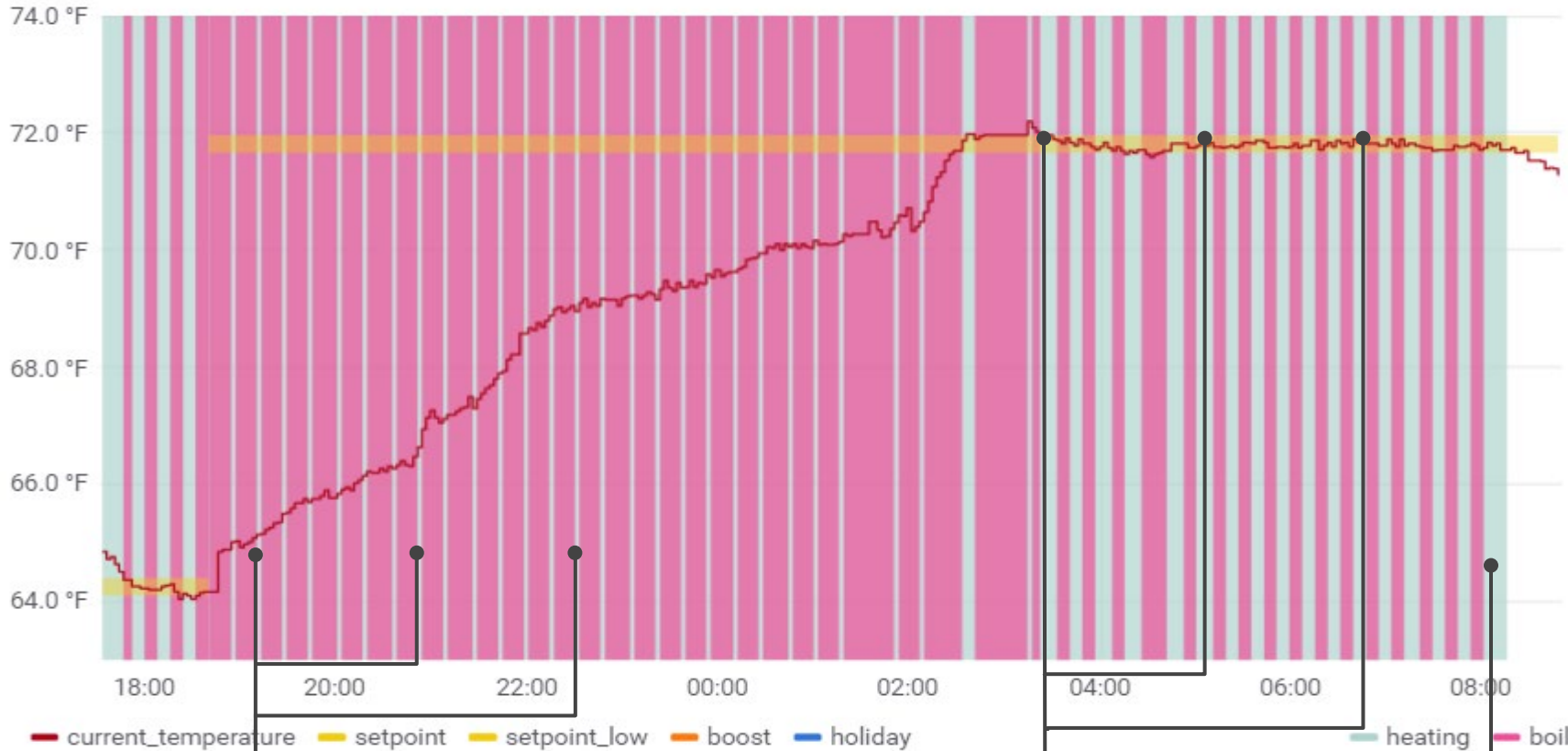
...your partner will leave because you keep changing the temperature...



HubController®

Eliminating Energy Waste in the Home

3 Automatic Energy Reduction Tech



Automatically reduces energy use by a proven* 34.7%

- + Duty cycle 7.3%
- + Smart temp. control 25.3%
- + Schedule shaving 2.1%

= Total Savings of 34.7%

Duty cycle
13 min on - 2.5 min off

Smart temp. control
8 min on - 8 min off

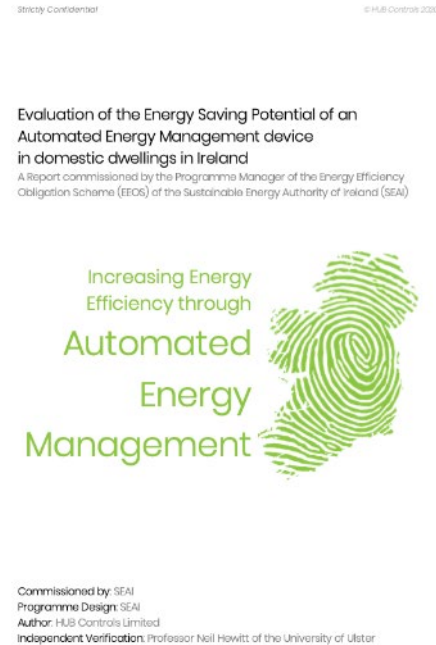
Schedule shaving
3 min + 5% scheduled event



4 Residential Carbon Reduction

Ulster University verified report on Irish Market Impact

- ✓ 3-year study
- ✓ 14.1 MMBTU average reductions per home per year
- ✓ 0.96 MTCO₂ average savings per home per year



Irish Market Use Case:
11,000+ HubController® installations



98,474 MMBTU Residential Heat Energy Savings to date and growing

6,242 Metric Tons of Carbon savings to date and growing



How it works...

1

Qualified installers connect the Hub Controller smart thermostat to customer home HVAC systems



2



Our Happy Hub Controller customers save money on their utility bills and gain smart control of their heating and cooling systems

3

This Produces...

- Energy/ carbon reductions
- Data-driven identification of home energy deficiencies
- Promotion of further energy efficiency measures



4

HVAC installer partners and other portfolio managers implement additional energy efficiency measures



5

Single Family Home benefits...

- ✓ Reduce their energy bills
- ✓ Further savings from data-driven energy efficiency upgrades
- ✓ Gain smart control of their heating and cooling systems

6

Utility benefits...

- ✓ Low cost per Therm & kWh energy efficiency measure for mandated heating decarbonization targets
- ✓ Reduced operations costs through gas and electric peak load reduction
- ✓ Existing customer revenue protection through better service

Next Steps... New York State HubController® Demonstration Project

NYSERDA Nextgen HVAC Innovation Grant

✓ \$500k partial funding

Objectives:

- ✓ Install 500+ HubControllers® in New York single family homes
- ✓ Independently Measure & Verify the HubController® induced residential energy and carbon savings over 1 year
- ✓ Build partnerships with all stakeholders...



Demo Project Partnerships...

- ✓ Housing Authorities, Social Housing Agencies
- ✓ Municipalities, Energy Smart Communities
- ✓ Utilities
- ✓ Retrofit & HVAC Contractors

Investment Partnerships...

- ✓ Investors interested in
 - Carbon Trading
 - Residential Energy
 - Retrofitting



Thank You



Ollie Hynes, CEO

ollie@thehubcontroller.com



Residential Market Advisory Group

Save the Dates!

- **Annual Residential Market Advisory Group Meeting with Breakout Session Topics**
 - Virtual
 - November 4, 8-10, 15
- **The Clean Energy for Homes Conference**
 - Presented by the Building Performance Association and hosted by NYSERDA
 - February 9 – 10 in Saratoga Springs, NY

Interested in Presenting?

- Email resmarket@nyserda.ny.gov to present at a future RMAG Membership Showcase
- Visit www.building-performance.org/ for information on the 2022 conferences.

Thank you!

