sense®

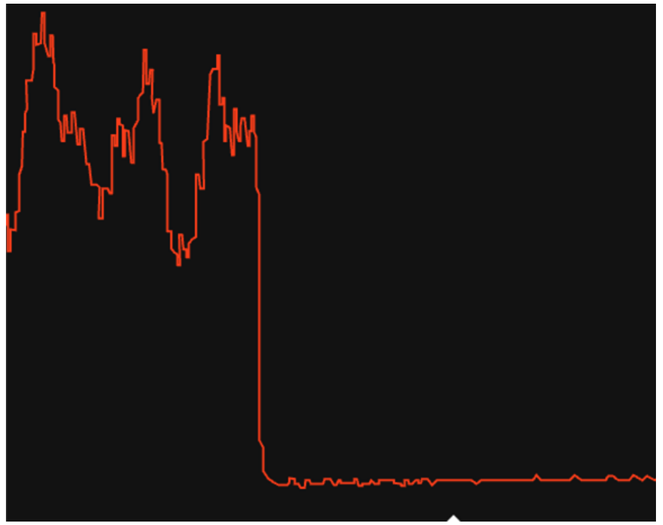
Sense Embedded Intelligence

Sense
Embedded Intelligence in the Electric Grid

How does Sense work?

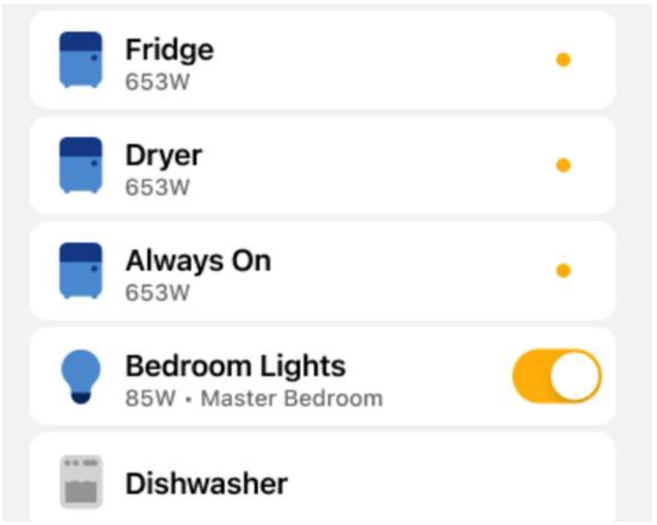
Embedded intelligence

Edge computing and low latency networking embedded in next generation AMI meters.



Machine Learning

Sense uses machine learning to identify the unique signature of each electrical device, determine its state and energy usage, tracks performance and failure signals



Network effect

Sense continues to build a library of device signatures. As Sense collects data in more homes, and samples a diversity of devices and appliances, the library grows.

Rollouts in Massachusetts

National Grid has led the push for AMI 2.0

- Worked with Sense and Landis+Gyr on meters capable of running software like Sense
- Rolling out in National Grid NY and National Grid MA

Unitil has adopted the same meters

Eversource is also rolling out next generation AMI meters

Software at edge of the grid

Safety + Resilience

Capacity

Modern Distributed Architecture

High Resolution Data
Edge computing
Real-time networking

Interaction between home/grid

Localized, real-time load flexibility

Service Upgrade Avoidance

Planning/forecasting

Outage management

Efficiency

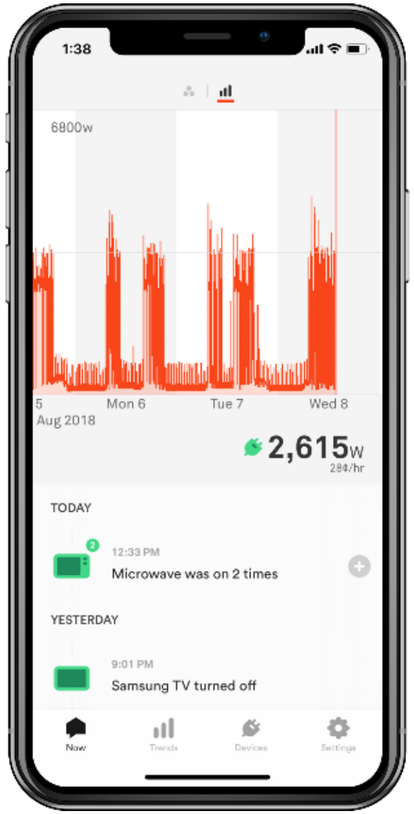
Load Flexibility

Electrification

Health and safety of home

Able to control devices through software

Next Generation
Utility Meter



Google Home
Voice-activated speaker

ecobee

wemo

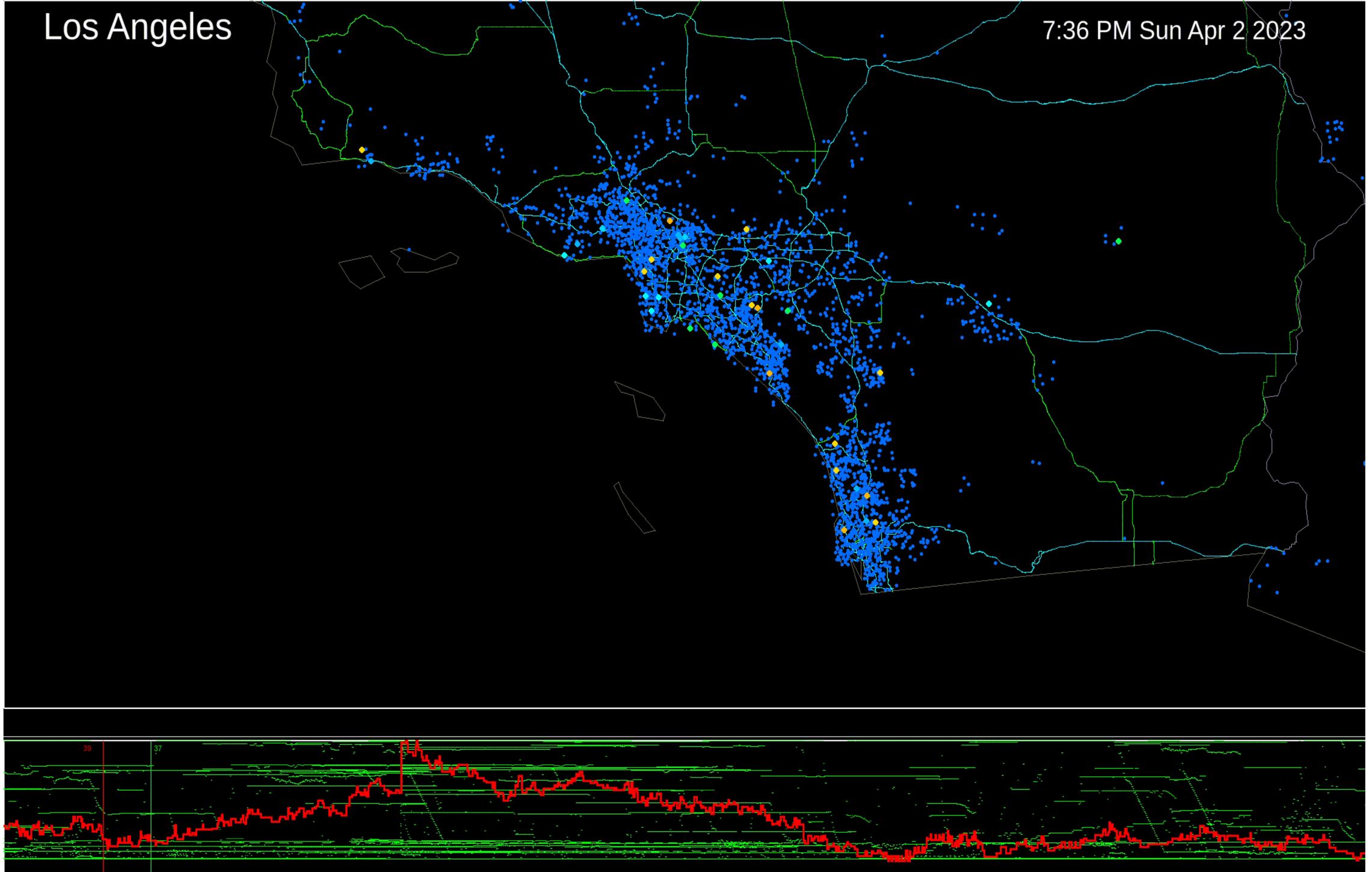
IFTTT

tp-link

hue personal wireless lighting

amazon echo

chargepoint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Load Flexibility

Most focus has been on demand response programs

- behavioral, focused on system-level peaks
- Real-time consumer applications can help increase targeting and participation
- Sense + OhmConnect (Renew) saw 2.5X peak savings compared with OhmConnect alone

Intelligence in meters allows

- Automated control of devices in the home
- Real-time view of power flow in grid

Can automate load based on

- Consumer preference
- Grid constraints
- Energy cost
- Carbon intensity

Joint optimization allow best tradeoffs between constraints

Policy Support Needed

Incentives for consumers to allow some degree of automation of devices

- Consumer should remain in control (through consumer-friendly apps)
- Need some reward for allowing flexibility
- Could be program-based or performance based

Policies to push industry to support controllable devices

- Some devices are allowing automated control, but far from being universal
- CA is starting to have mandates for devices sold in state (pool pumps for example)
- Should at least tie incentive and rebates to devices which allow control from the smart meter

Thank you

Sense.com