STEPWISE

Beyond the Panel Upgrade

Using data and load management to unlock home electrification

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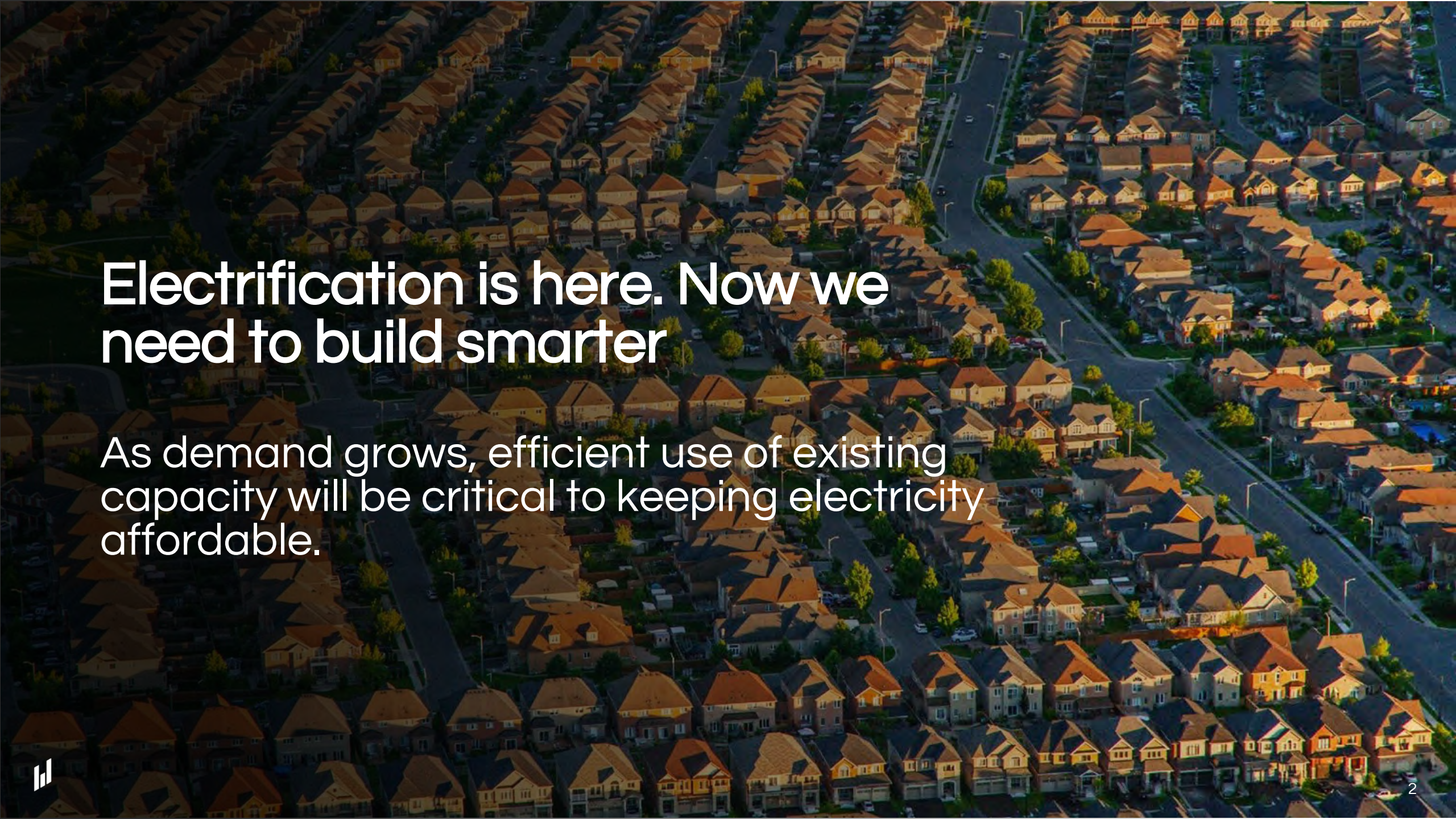
Stepwise Electric



Electrification is here. Now we need to build smarter

As demand grows, efficient use of existing capacity will be critical to keeping electricity affordable.

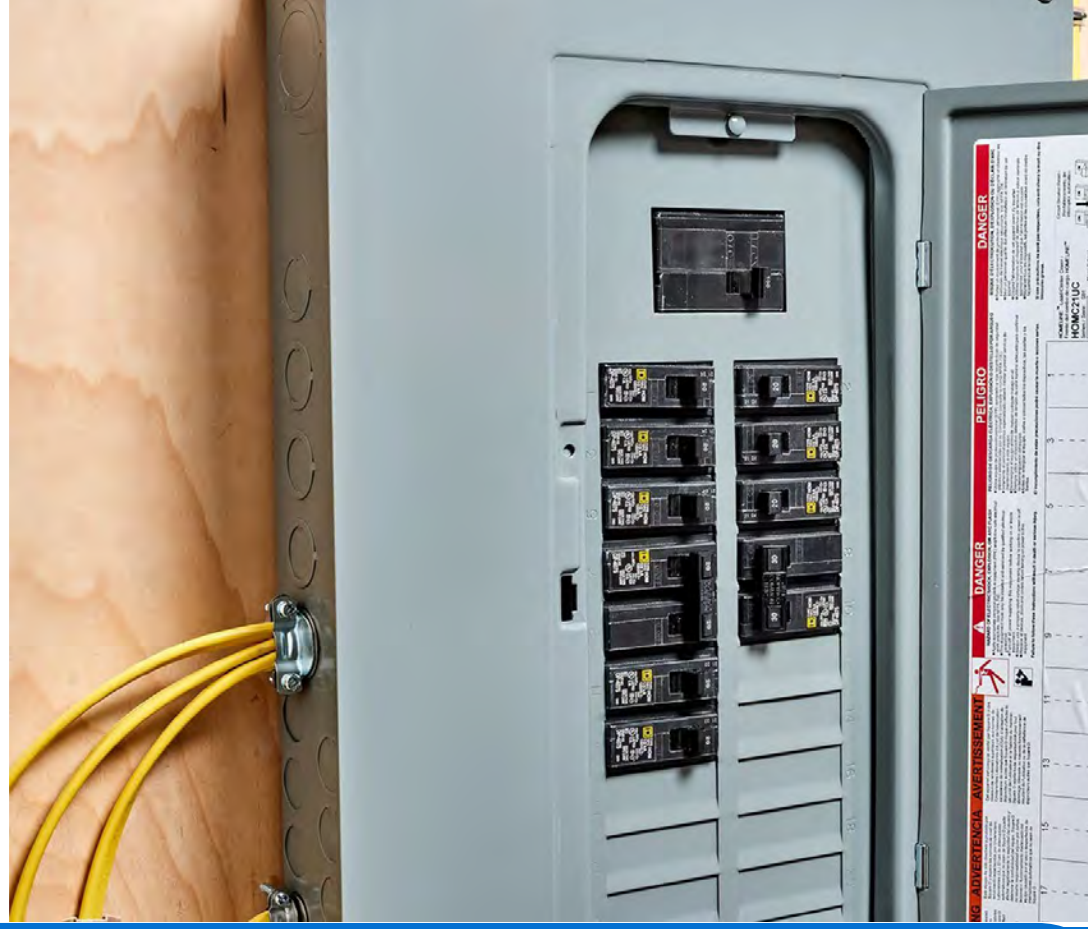
I saw first hand the problem with defaulting to electric panel upgrades

MIT MANAGEMENT SLOAN SCHOOL

What we will cover

1. Why the upgrade-first status quo persists
2. How intelligent load management changes the decision
3. Case Studies
4. MA policy learnings

Most electrification projects get stuck at the panel



Limited service capacity

Most building units have **60A-100A** panels

Budget Constraint

$4-10K on avg. of out of pocket consumer costs

Long delays

Due to material shortages and **utility permits**

WHY DEFAULT UPGRADES PERSIST

The status quo is upgrading and over-building

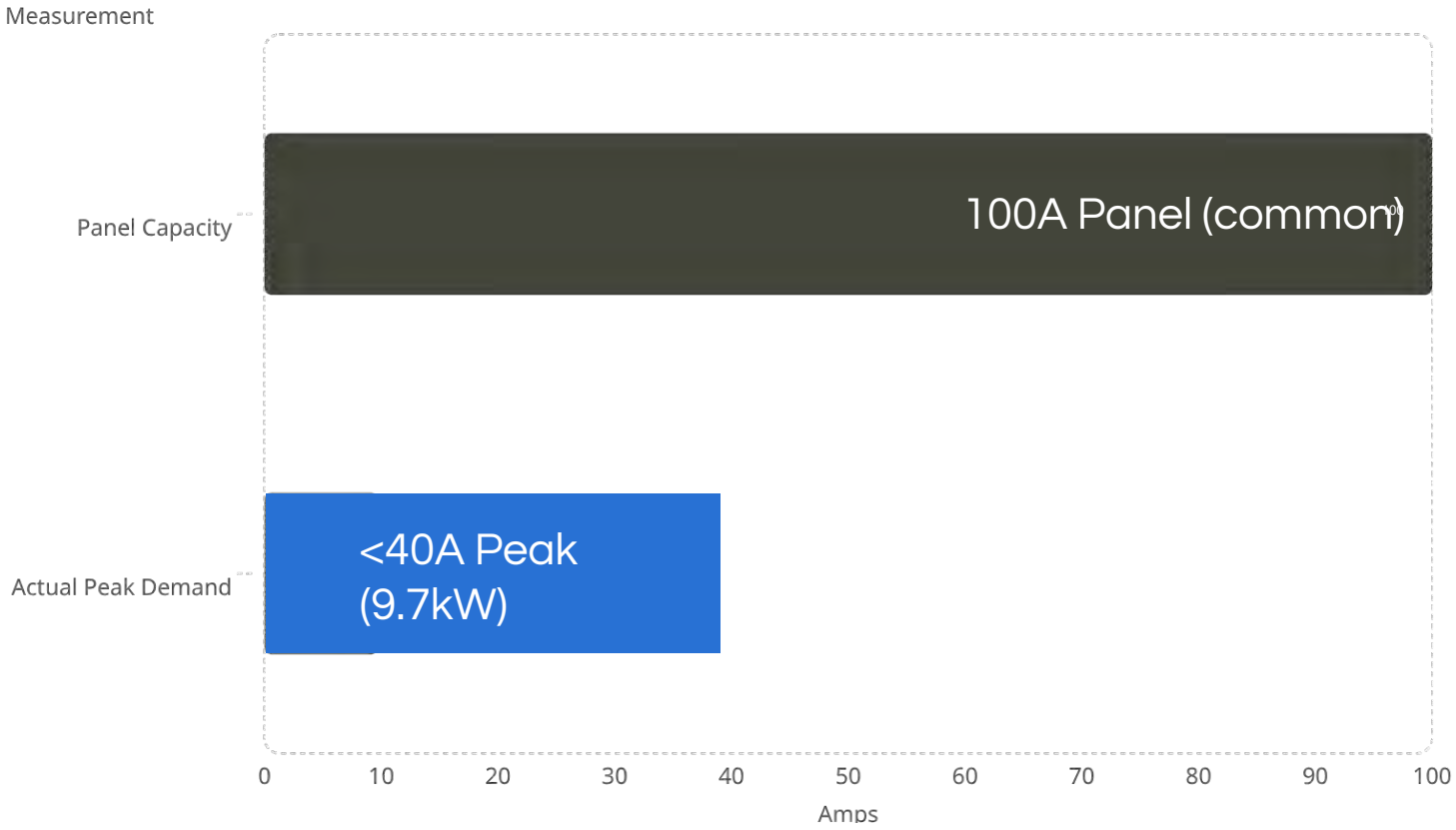
Homeowners

Electricians

HVAC installers

Utilities

You have more room than you think



- 98% of homes have available capacity
- Mean peak demand across all homes was <40% capacity

Data from 11,940 U.S. dwellings from 2026 LBNL study. (consistent with Stepwise data)

It’s not just an infrastructure problem.

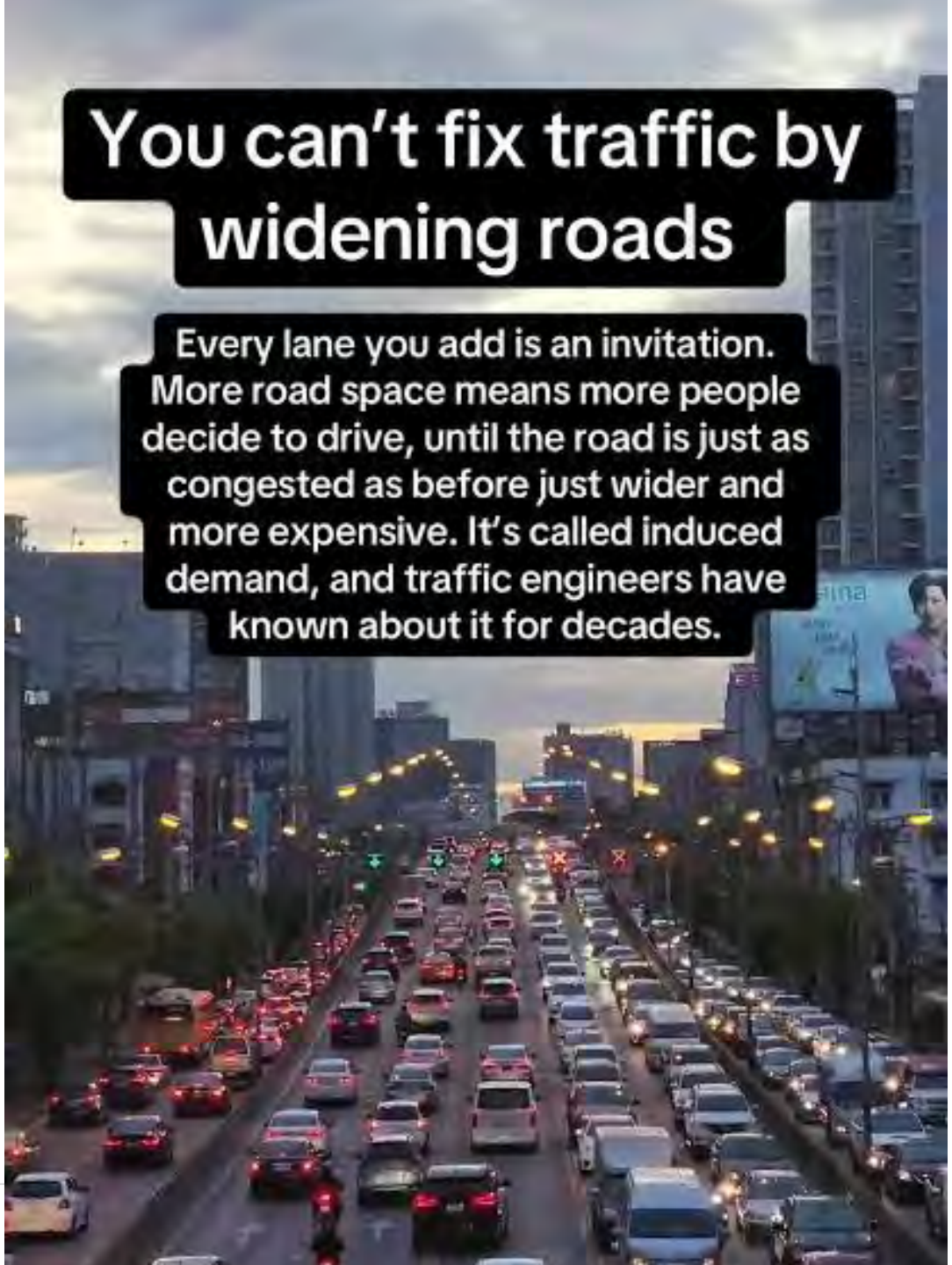
It’s a timing problem.

This gap between average and peak demand drives billions in unnecessary infrastructure costs.

REFRAME

A better analogy:

Widening roads vs.
Decreasing cars on the road



Intelligent Load Management: Requires 2 active ingredients

DATA

Visibility into whole-home usage, appliance behavior, panel limits, and peak events

+

CONTROL

Ability to adjust, sequence, or pause non-critical load during the few true peaks

SOLUTION LANDSCAPE

The load-management market is a spectrum and the middle is the opportunity

Smart panels

Maximum data + control
Highest cost
Least retrofit friendly

$7K Avg.

Intelligent load management

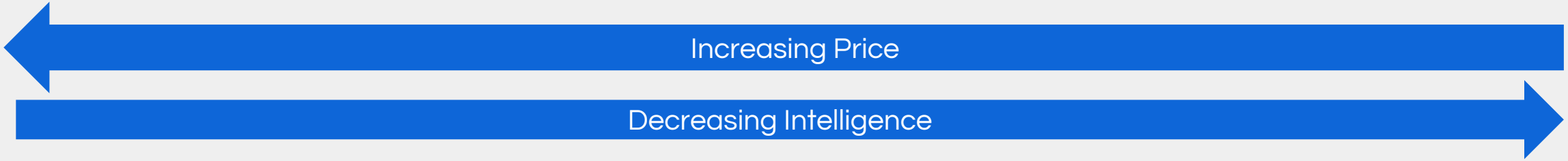
Whole-home monitoring + selective appliance control
Cost-effective
Retrofit friendly

$1.5K Avg.

Basic Load Sharing

Low cost
Local control / optimization
Limited data

$600-$2K Avg.



Stepwise monitors the panel and controls the connected load automatically

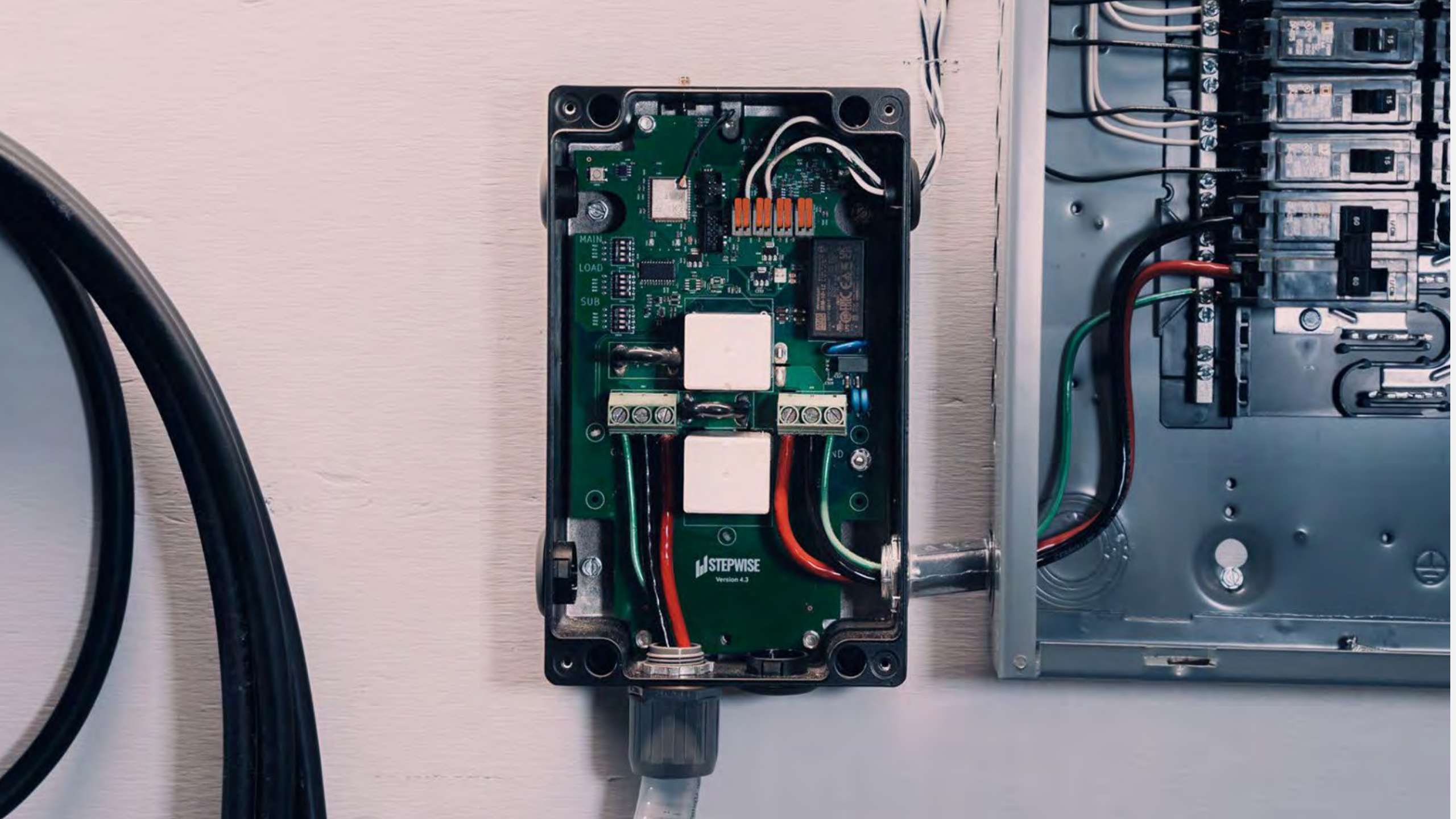
Electric Panel

Stepwise Tap™
UL-listed real-time monitoring + dynamic load control

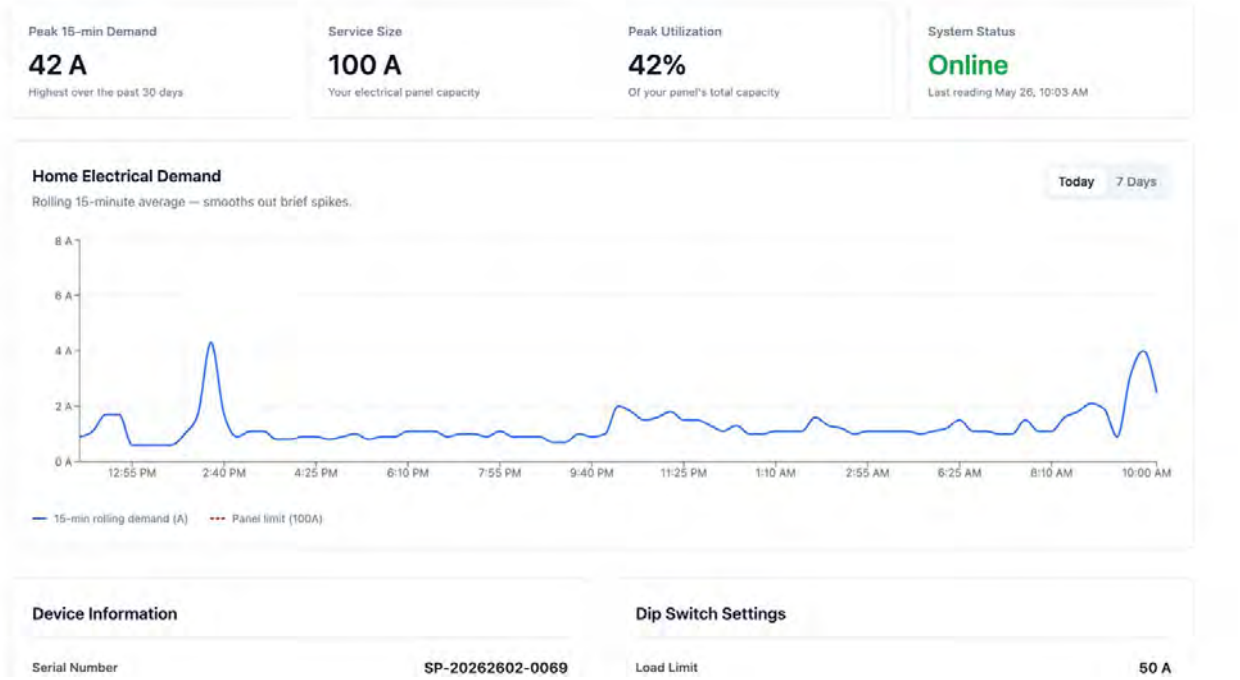
Example appliances

- EV Charger
- Heat pump
- Water heater
- Other large load

Installed in under 2 hours alongside electrification projects; supports existing panels and existing appliances


MAIN
LOAD
SUB
STEPWISE
Version 4.3

Data after install: future proofing the home + the grid



1 **Today - Customer wants large appliance**

See real panel demand and prove the home is operating safely within capacity (NEC 750)

2 **Once installed, system collects actual usage**

Use measured demand to assess whether a heat pump, water heater, or second EV charger can fit (NEC 220.87)

3 **Grid value**

Enable managed charging, flexible load, and future utility program participation

The same device that unlocks today's install also creates a data foundation for future upgrades

CASE STUDIES

CASE STUDY

Deployment example: heat pump in Lexington, MA

- Single family home in MA with 100A panel wanted a 35A Mitsubishi heat pump
- Existing load calculation of 117A with heat pump due to 2 electric ovens + A/C
- Stepwise installation cost **$1.3K** vs. panel upgrade of **$4.5K**
- Simple single day installation to wire and complete the heat pump job

CASE STUDY

Deployment example: Multi-family EV charging in DC

- Small multi family building with outdoor parking
- EV charger would have triggered building wide upgrade
- Stepwise was installed outdoors directly off the meter to avoid **$15K upgrade** + **trenching** cost

CASE STUDY

The power of data: Stepwise installation on constrained CT panel reveals future capacity

Installation Context

- 48A EV charger installed on a maxed out 100A panel in single family home in CT
- 30 days of monitoring in July 2024 showed **peak demand of 51A**

Using NEC 220.87

- 51A (total peak) - 48A (EV peak) = 3A (rest of house peak)
- 3A x 1.25 = ~4A
- 4A + 37.5A (heat pump with 125% buffer) = 41.5A

- Customer with constrained panel is able to add a full level 2 charger and plan for a 30A heat pump next due to intelligent load management

Three ideas to take back to your projects

1. A “full” panel is not necessarily a fully utilized panel
2. Capacity can be managed, not just expanded
3. Panel upgrades should be a solution—not the default

How we can work together

Help make panel upgrade avoidance a normal part of sustainable building practice

ASSESS

Send us constrained projects

EDUCATE

Partner on contractor outreach & education

PUBLISH

Turn field data into shared learning

STEPWISE

Energy Unlocked.

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