

# Residential flexible demand

Lessons from the front lines  
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# Homes are where the grid gets hard — and decided

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**20%+**

of U.S. energy is used in homes

**Worst-timed**

residential peak hits when the grid is most stressed

**A crisis**

households face a home-energy affordability crunch

**17**

connected devices in the average U.S. home

# The four pillars of residential energy today and in the future



01

## Smart Thermostat

HVAC is **~50%** of home energy use — about **10%** of all U.S. energy.



02

## Water Heating

**18%** of home energy use — and roughly **55%** of heaters are electric.



03

## Home Battery

Only **~0.3%** of U.S. households have a battery system today.



04

## EV Charging

About **~3%** of U.S. households have a Level 2 EV charger.

# Three design choices that can determine the scale and success of a residential grid services program

01

## Recruit at the decision moment

Enroll customers while they're already buying or installing — not after.

**60–80%**

PARTICIPATION

02

## Respect behavioral economics

Customers discount future, variable value toward near-zero.

**\$1 ≈ 35¢**

PERCEIVED VALUE

03

## Make the value bankable

Guaranteed, upfront terms — not a "trust me" on future payments.

**\$13/mo**

GUARANTEED

## 01 DECISION-MOMENT ENROLLMENT

# The vast majority of customers don't 'join programs.' So enroll them while they're already making a decision

### THE PROBLEM

Opt-in outreach only reaches customers **after** they've already bought or installed their equipment.

~10%

typical participation ceiling

### THE SOLUTION

Enroll customers **while they're acting** — and make it nearly automatic.

- 1 Auto-enroll at point of sale or install: thermostats, HVAC, EV chargers, batteries.
- 2 Utility program enrollment is driven through private companies in most cases.

### IT WORKS IN THE FIELD

#### Renew Home

60–80%

Google Nest embeds an easy enrollment at thermostat install, leading to a 4 GW grid resource.

#### SunStrong / Sunnova

60–80%

Auto-enrolls batteries via contractual agreement, providing for opt-out at any time.

# People don't value future, uncertain money the way a spreadsheet does

**\$1 → 35¢**

What \$1 of future, variable revenue is actually worth to a customer today.

**\$11,000**

MODELED NPV

**\$3,850**

PERCEIVED

DRIVER 1 · PRESENT BIAS

Rewards past year two are mentally near-invisible — a 10-year variable stream discounts toward zero.

DRIVER 2 · AMBIGUITY AVERSION

Unknown timing, unknown amount. Faced with an opaque payout, people default to inaction.

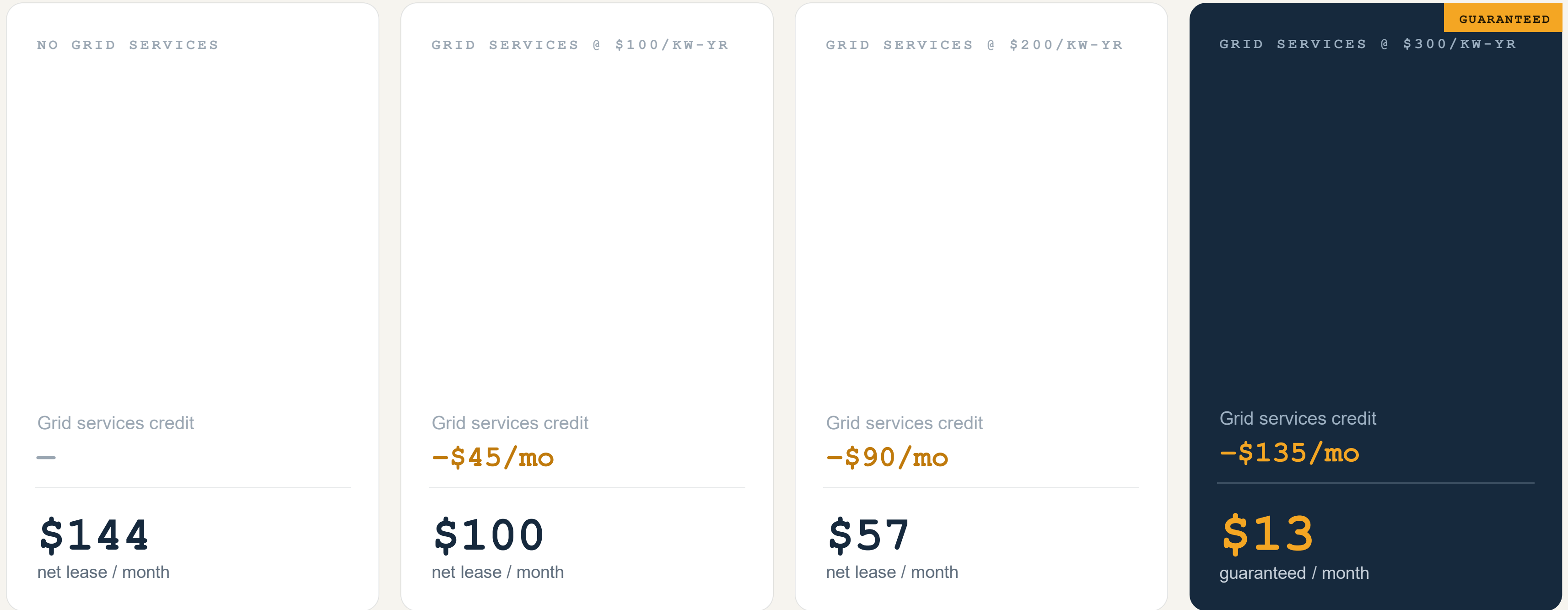
THE DESIGN RULE

Design programs to be **upfront, guaranteed, and bankable.**

03 MAKE IT BANKABLE

# A bigger lease plus a "trust me," or \$13 a month guaranteed?

ALL-IN SYSTEM COST (EQUIPMENT + INSTALL) \$16,000



2 Powerwalls (27 kWh) · 5.40 kW enrolled (27 kWh × 80% ÷ 4 hrs) · 10-yr contract · 40% ITC at 85¢ · FMV Yr 10 \$5,000 / dual system · approximate.

# Thank you

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