

## A PLAIN-LANGUAGE GUIDE

# Understanding NEC 220.87

*A measured-data approach to proving your electrical panel has room for a heat pump, EV charger, or other new load, without an unnecessary (and expensive) service upgrade.*

## What Is NEC 220.87?

NEC 220.87 is a section of the National Electrical Code that lets an electrical service load calculation be based on actual measured electrical demand, instead of nameplate ratings and generalized demand factors.

In short: it's based on how a building actually performs, not on modeled, worst-case assumptions.

### It applies when:

- The building has an existing electrical service.
- AMI "smart meter" demand interval data is available (15 min ideal)
- The calculation reflects typical operating conditions.

## Two Ways to Calculate Load

Traditional calculations size a service using standardized tables built for an average home decades ago. NEC 220.87 instead asks what this specific home actually draws, using data from the utility meter already on the wall.

|                           | Traditional Load Calculation                            | NEC 220.87                                                                                     |
|---------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------|
| What it's based on        | Nameplate ratings and standardized demand factors       | Actual measured demand from the utility meter                                                  |
| What it reflects          | A modeled, worst-case estimate                          | How the building actually performs                                                             |
| Where the data comes from | Manufacturer specs and code tables (Table 220.55, etc.) | 12+ months of utility interval (AMI / smart meter) data                                        |
| Typical result            | Often overstates real-world demand                      | Reflects true, measured peak demand, almost universally lower result than traditional approach |

## Why 220.87 Is Often the Better Approach

### Accuracy

Reflects true, measured peak demand, not a modeled, theoretical maximum.

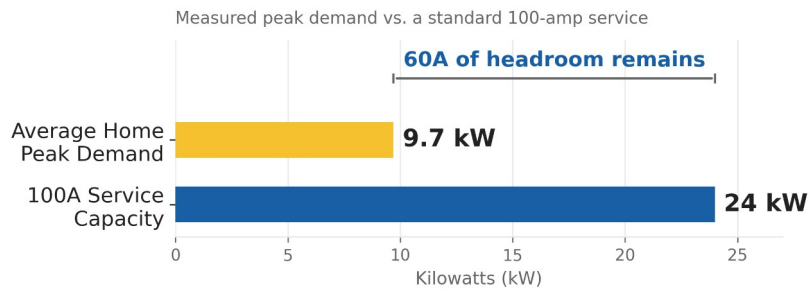
### Cost Savings

Avoids unnecessary service or transformer upgrades that can cost thousands of dollars.

### Time Savings

Can save months otherwise spent waiting on a utility service upgrade.

## The Average U.S. Home Has Room to Spare



Source: Less & Walker (LBNL) and Murphy et al. (LBNL), measured 15-minute peak demand across 11,940 homes.

### Code-Aligned, Not a Shortcut

220.87 is explicitly permitted by the NEC, not a workaround. It requires sufficient data quality and clear documentation, and the Authority Having Jurisdiction (AHJ) always retains full authority to assess whether the method was applied appropriately.

## The Research Behind It

Two Lawrence Berkeley National Laboratory (LBNL) studies form the evidence base for this approach:

- Less & Walker, *Applied Energy* 410:127422
- Murphy et al., *Journal of Building Engineering* 120:115576

Across 11,940 homes, mean measured 15-minute peak demand was just **9.7 kW**. On average, **NEC 220.87 produces roughly 40% lower calculated loads than the traditional 220.83 method** for existing dwellings, which is often the deciding factor in whether a service upgrade is actually required.

## When Is 220.87 a Good Fit?

- An existing building undergoing renovation or electrification (heat pump, EV charger, etc.).
- A service upgrade is being suggested because of a calculated, not an observed, overload.
- Utility AMI / smart meter interval data is available for the property.

### Recognized by Regulators

*"An acceptable means of calculating an existing service load."*

— Dennis Blair, Vermont Chief State Electrical Inspector

## How TrueLoad Helps

TrueLoad turns a utility's raw interval data into an AHJ-ready NEC 220.87 report, so a contractor doesn't have to build the calculation by hand.

- Request the utility's AMI data using a ready-made email template.
- Upload the file, TrueLoad finds the true measured peak automatically.
- Add the new equipment being installed, TrueLoad checks it against the service capacity.
- Print a permit-ready report showing PASS or FAIL in minutes, not weeks.

Learn more at [trueloadapp.com](https://trueloadapp.com)

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