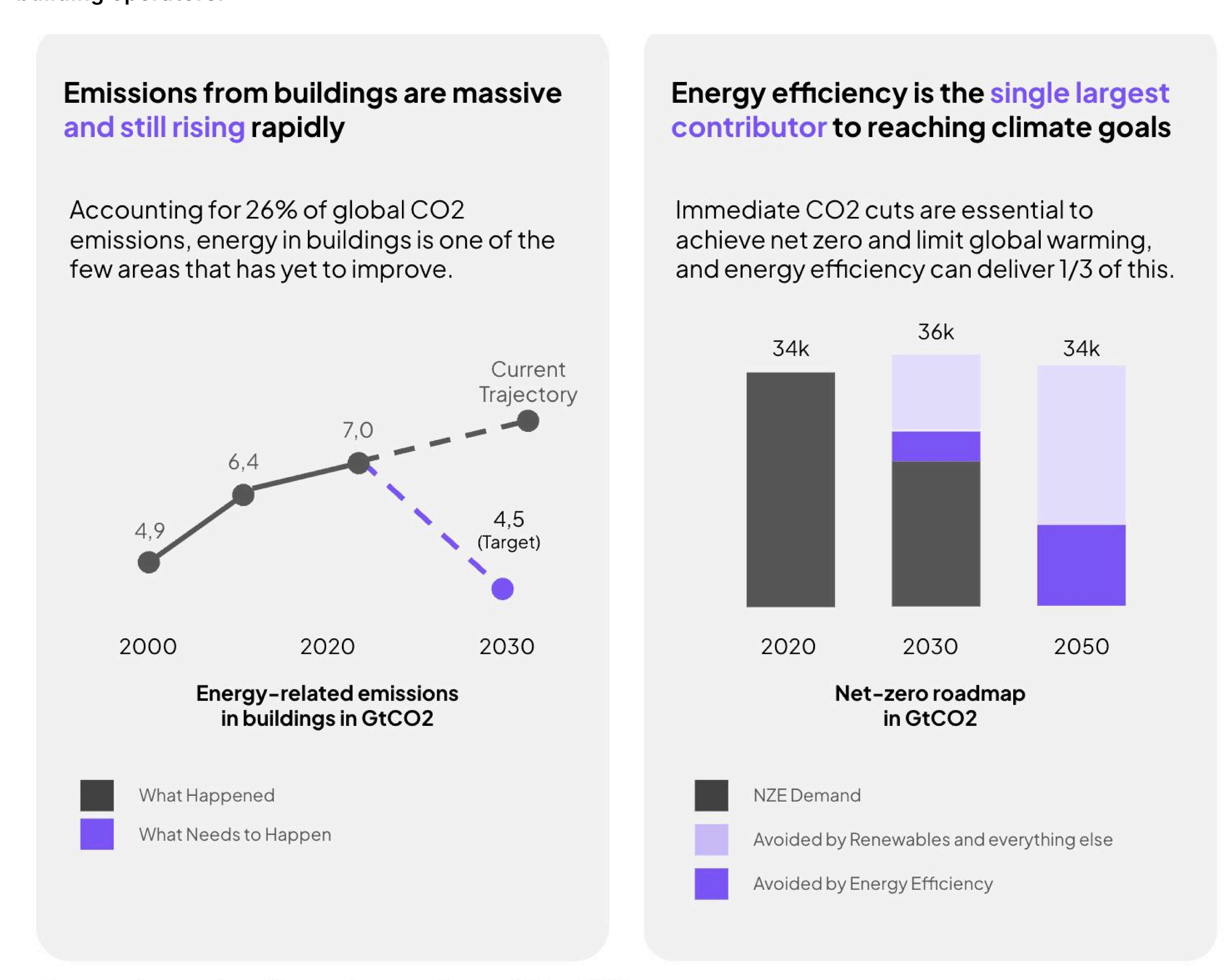
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# Al-Powered Measurement & Verification

Building Interpretable Counterfactual Models to Verify Energy Savings in Buildings

## A perfect storm is hitting the global buildings space

Buildings account for a major share of global energy use and carbon emissions. Rising energy prices, growing climate commitments, and aging infrastructure are putting unprecedented pressure on building operators.

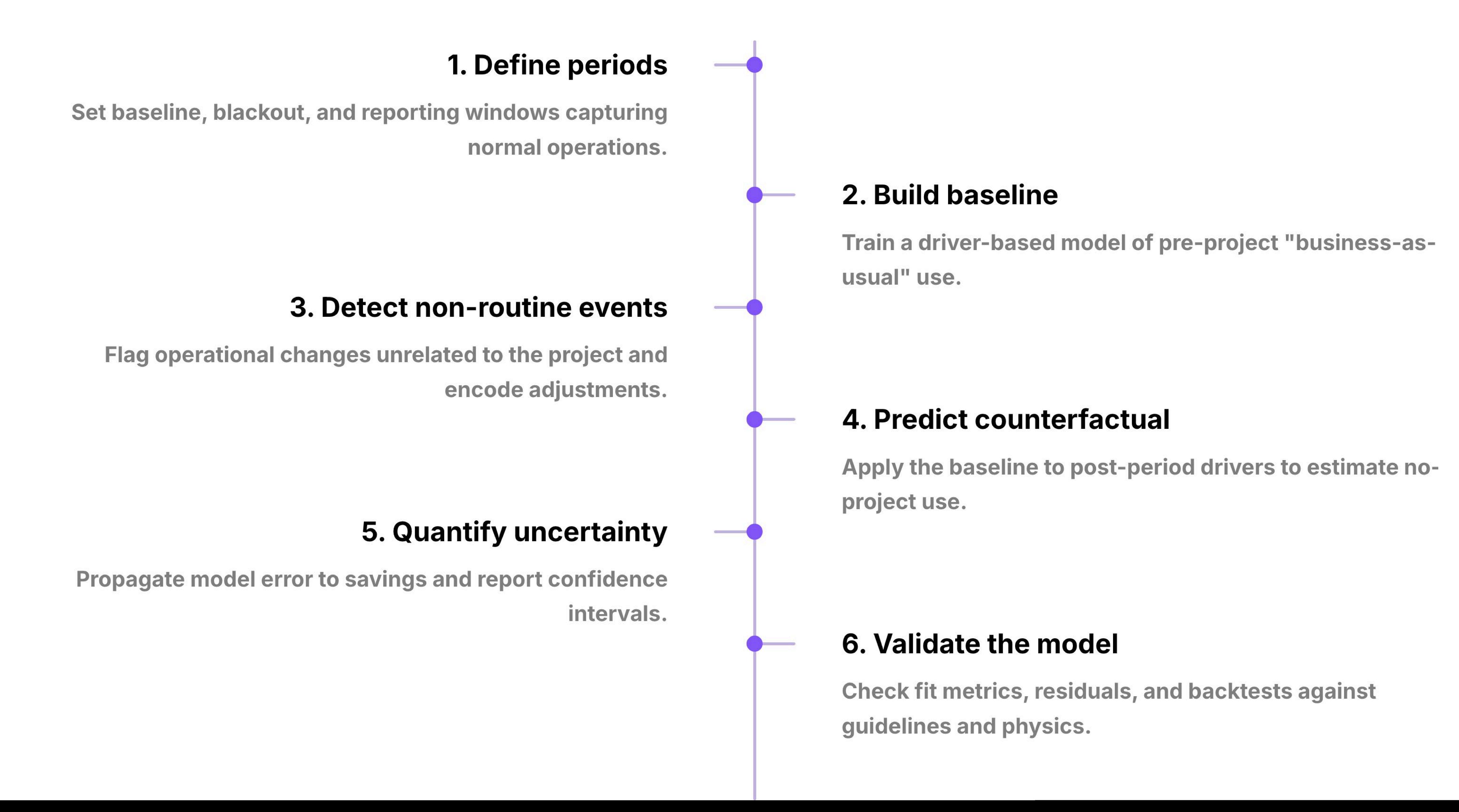


Sources: International Energy Agency, Energy Cities, NYC.gov

### The M&V workflow at a glance

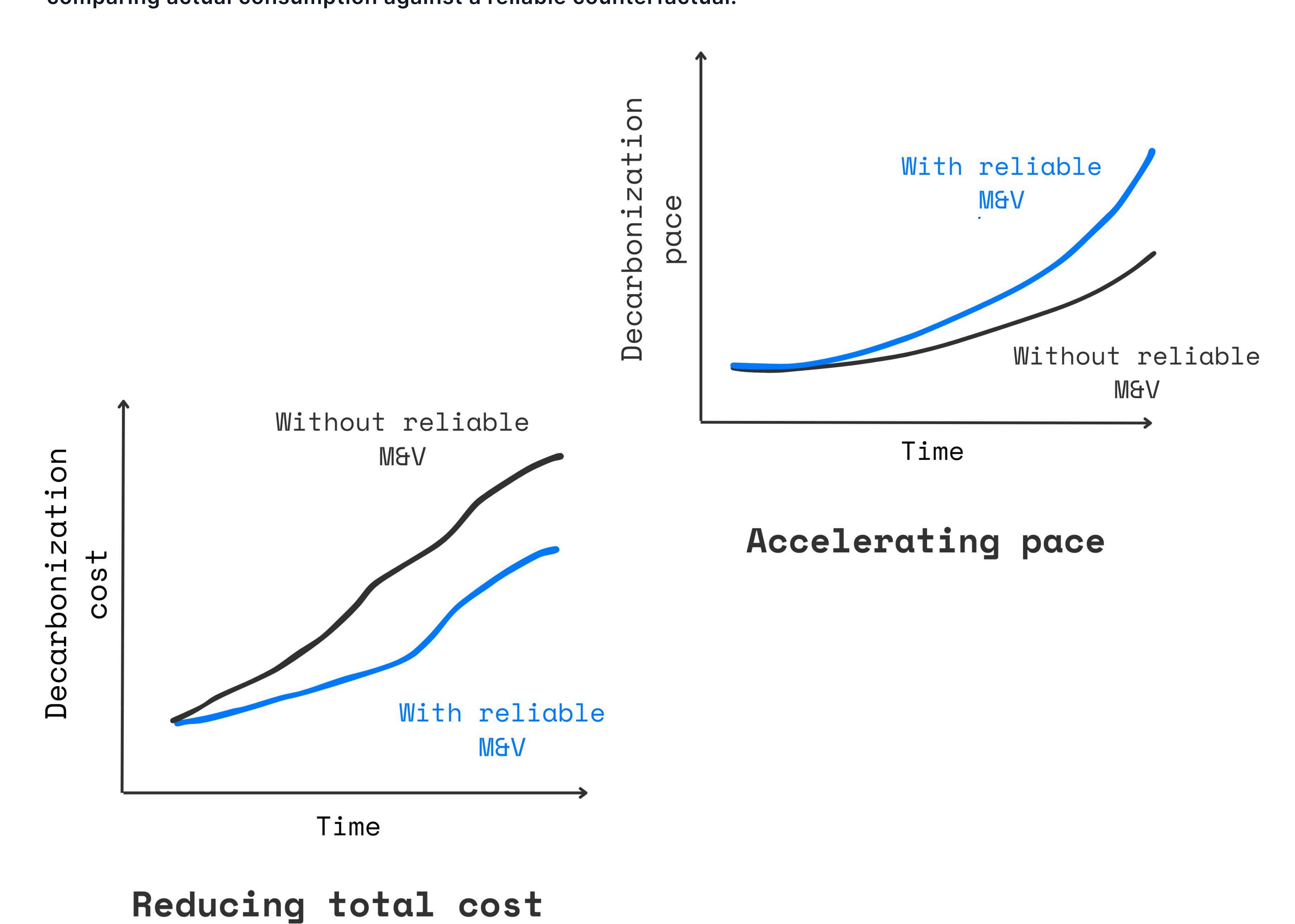
Traditionally, M&V relied on manual analysis of monthly utility bills—slow, error-prone, and impossible to scale across large portfolios.

Today the entire process can be automated using meter data and machine learning. The diagram below shows the 6-step workflow used to generate reliable, audit-ready savings estimates at scale.



# Measurement & Verification makes decarbonization faster and more efficient

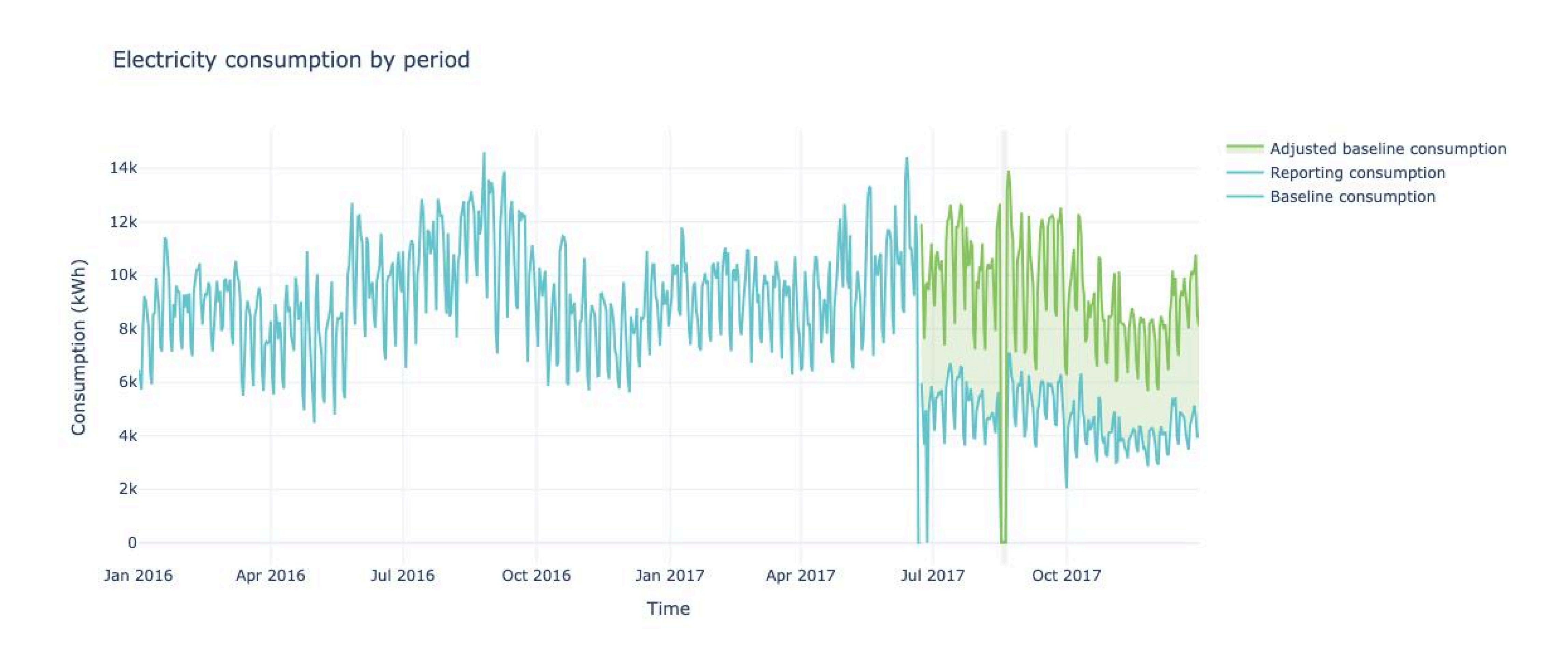
To decarbonize buildings at scale, we need to know what works. Measurement & Verification (M&V) quantifies the true impact of efficiency actions by comparing actual consumption against a reliable counterfactual.



Building a counterfactual energy model with Machine Learning

We train a supervised model (in this case LightGBM) using historical meter data, weather variables, and calendar features.

The model learns how the building responds to external conditions and operational patterns.



The interpretability plot below shows how temperature variations influence the building's energy consumption prediction from the model.

The PDP curve (blue) reveals the overall trend learned by the model, while the ICE lines (red) highlight how individual days respond differently across temperature ranges.

