


# Collaborative Sensing: An Approach for Immediately Scalable Sensing in Buildings

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## Motivation for Smart Buildings

Buildings contribute roughly half of total energy in USA

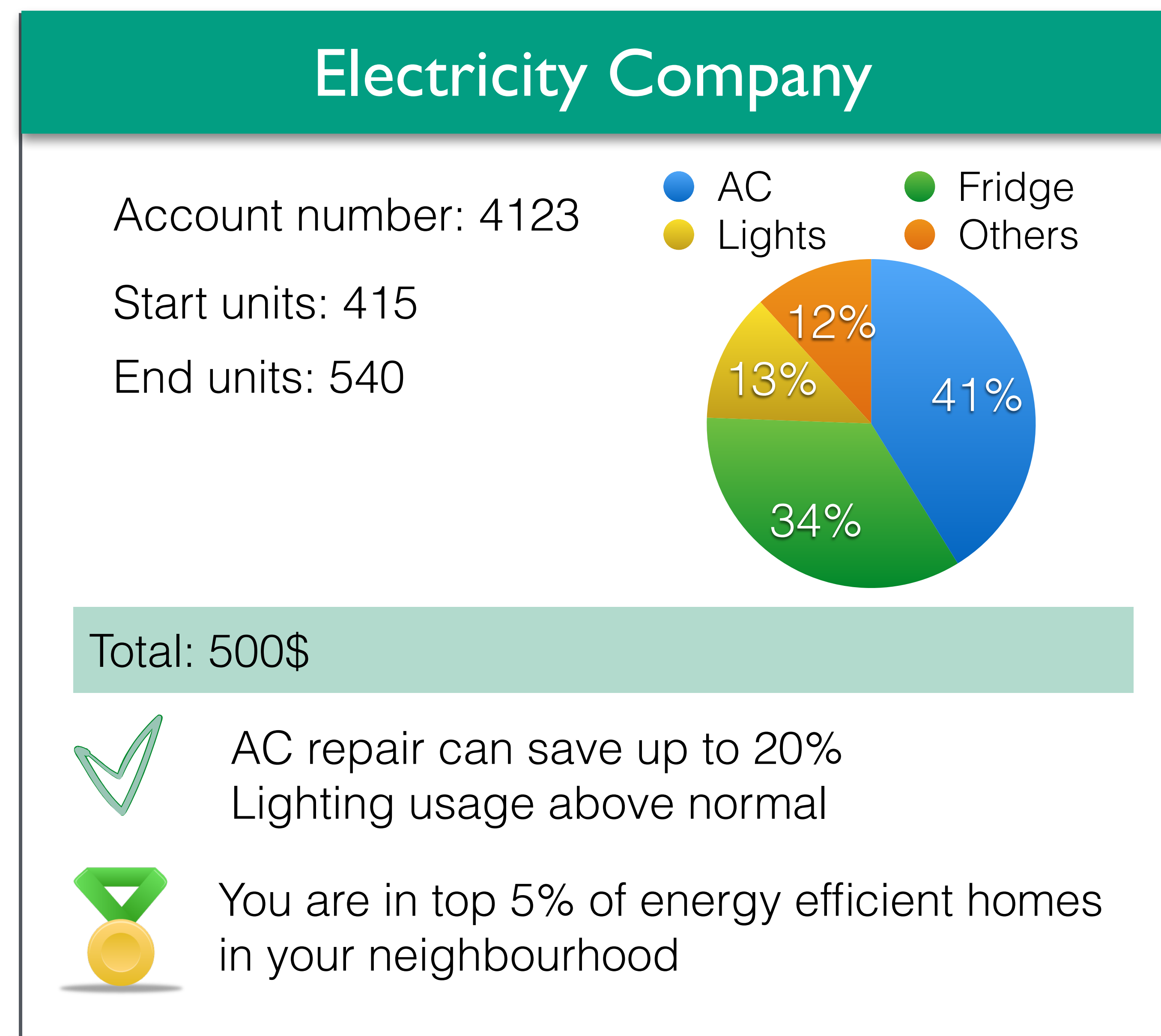


People spend up to 90% time within buildings

Building conditions affect occupant health

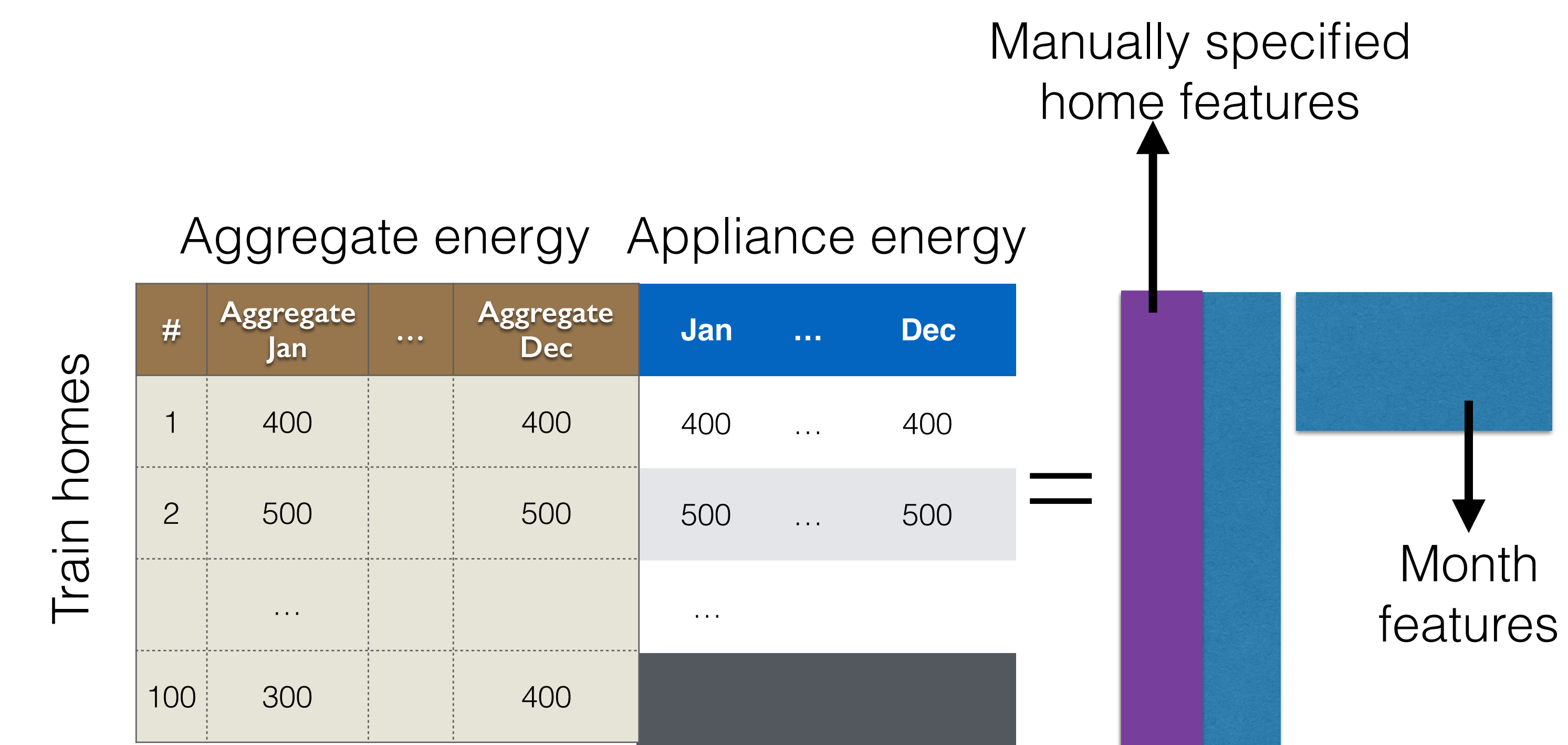
Indoor building conditions can impact productivity by up to 11%

## Example Application: Energy Breakdown



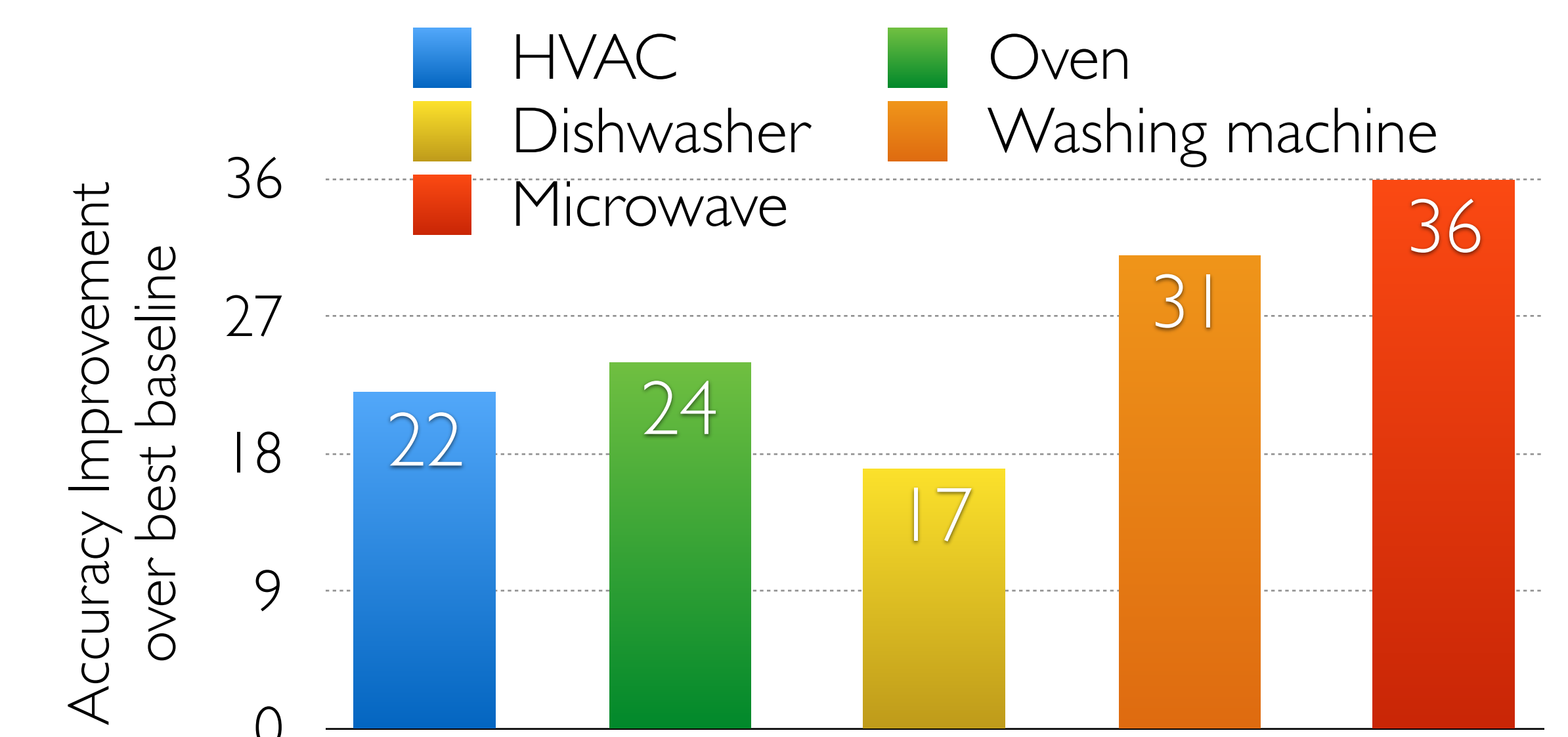
Energy breakdown can help occupants save up to 15% energy

## Approach



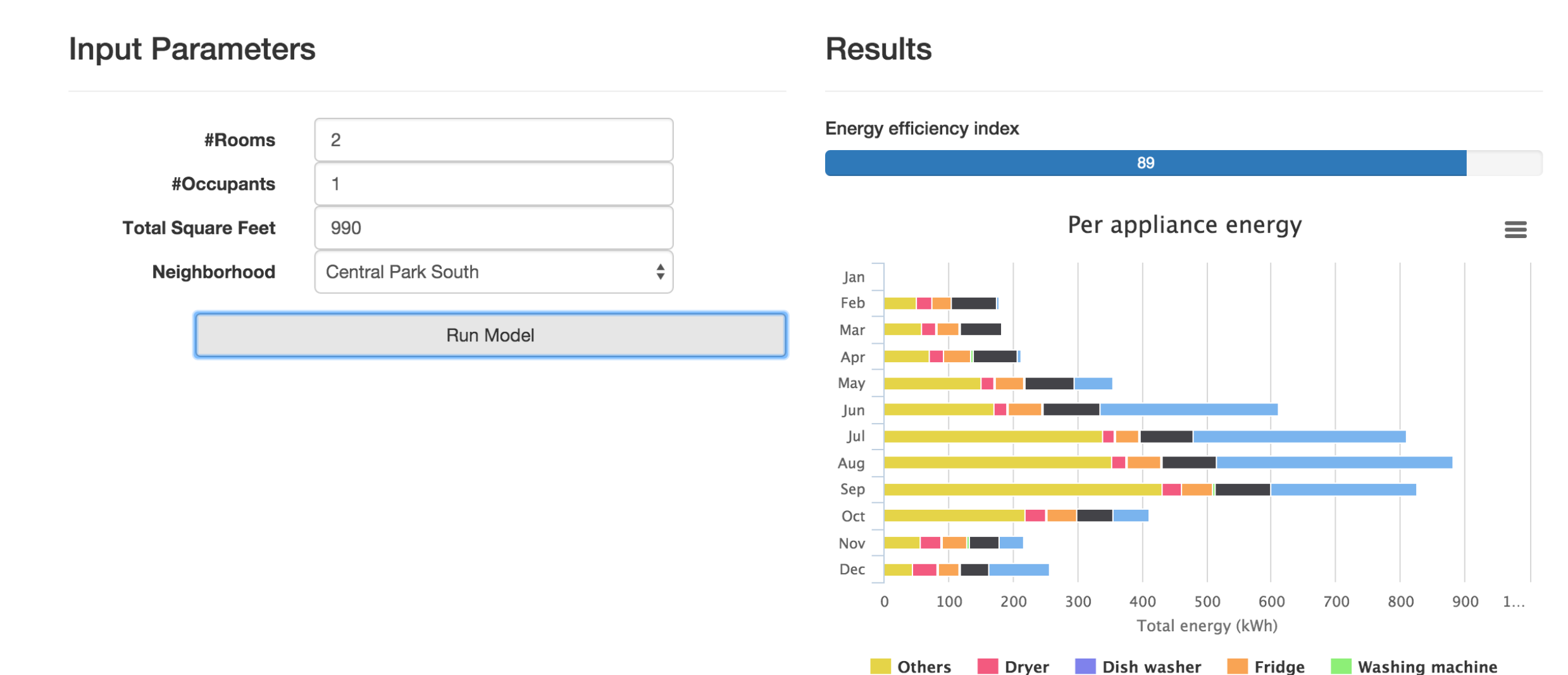
Reconstruct the sensor data of one building based on sensor data collected in other buildings

## Results



Our approach is up to 36% more accurate than the state-of-art

## Web Application for 60M Homes




## The Billion Building Challenge

“To enable smart building functionality for a billion buildings across the globe, including homes, apartment buildings, office buildings, restaurants, and hotels.”

### Current State

Buildings not extensively instrumented:



Expensive    Labour intensive

Unclear ROI

## Related Work



Plug load monitor



Circuit level monitor



Smart meter

Existing solutions for energy breakdown require sensors in each home