



Sources of Error in Home Energy Use Calculations: Evaluation in Real-World Laboratory Homes

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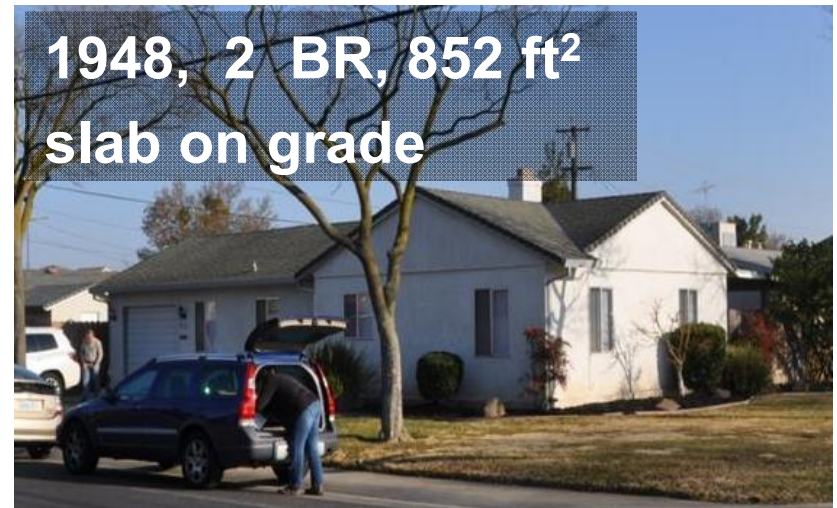
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HERS: Reliable home energy advice or roll of the dice?

- Use is widespread and growing
- Multiple prior studies suggest problems
- Why?
- What are the implications?
- How can the situation be improved?

Four Laboratory Houses



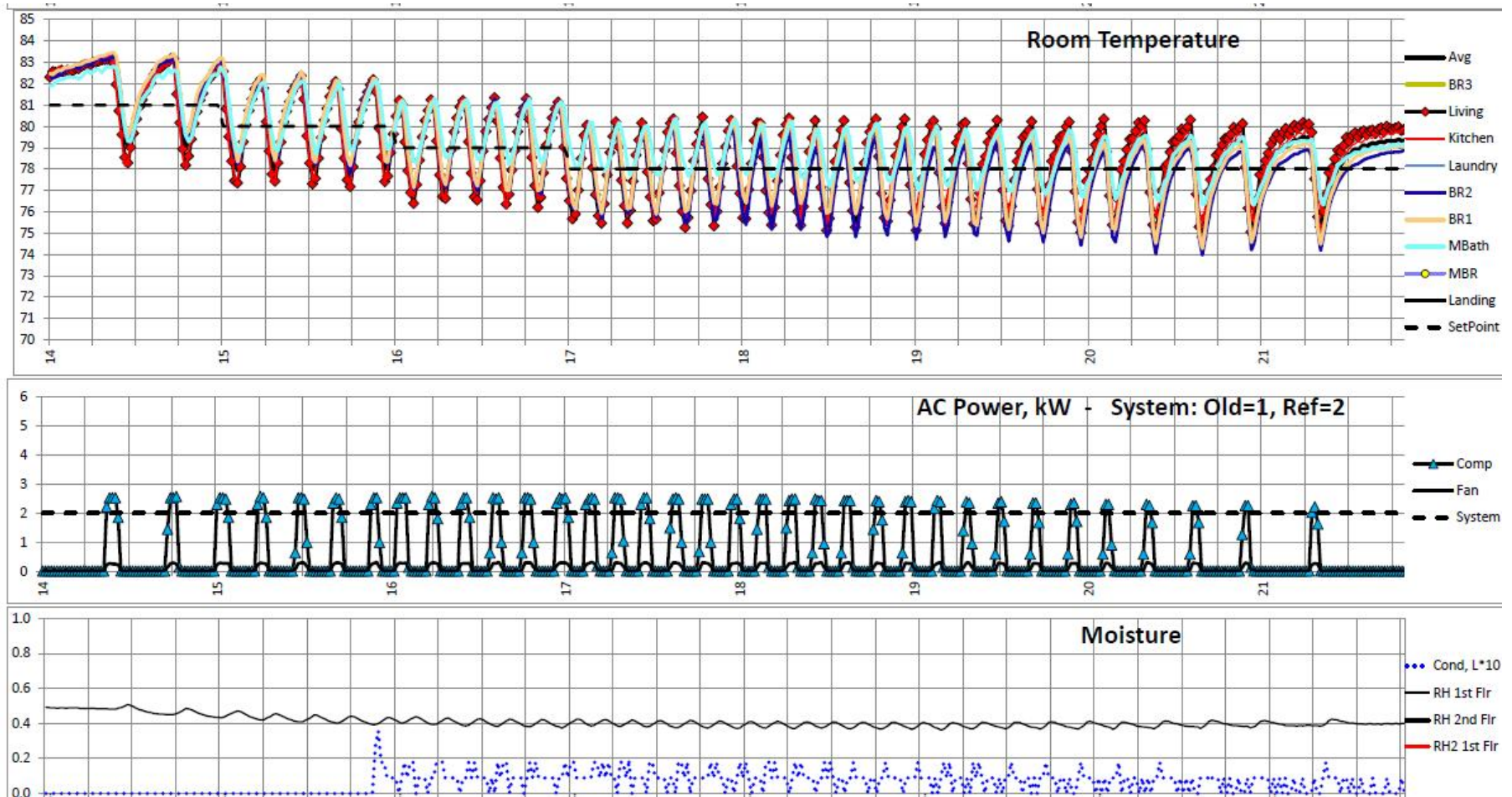
Simulated Occupants



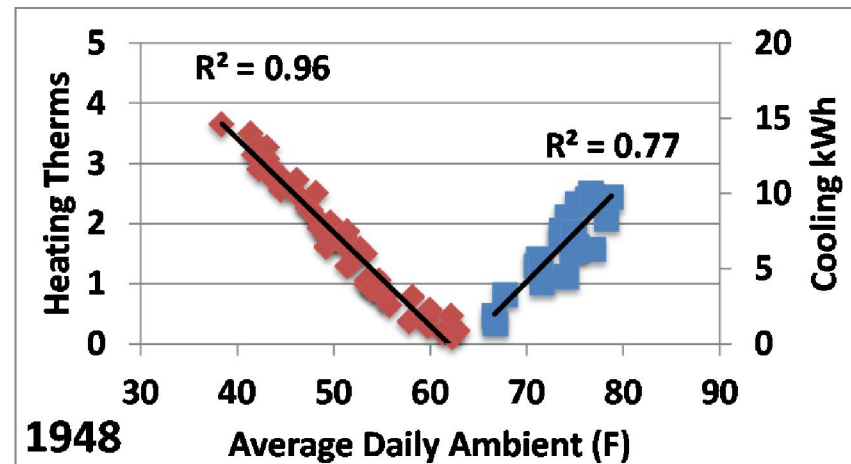
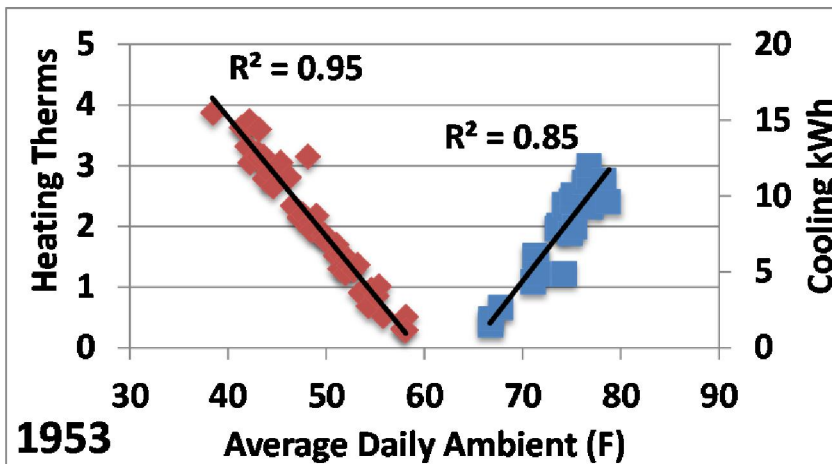
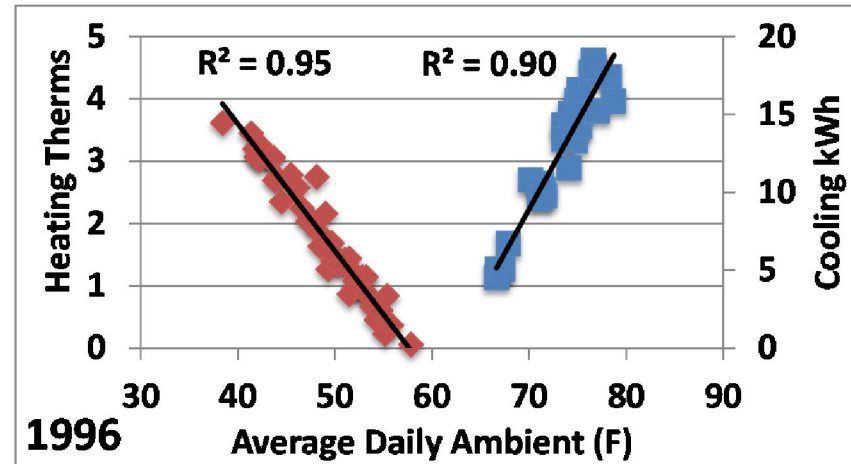
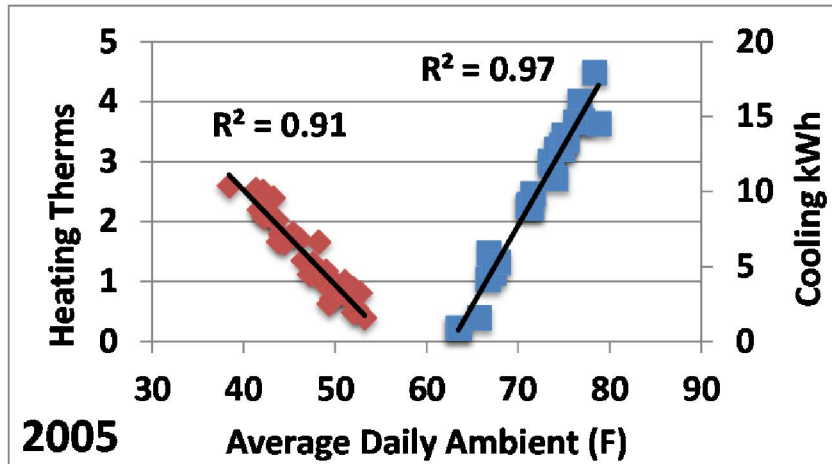
Extensive Instrumentation



Daily Data Review

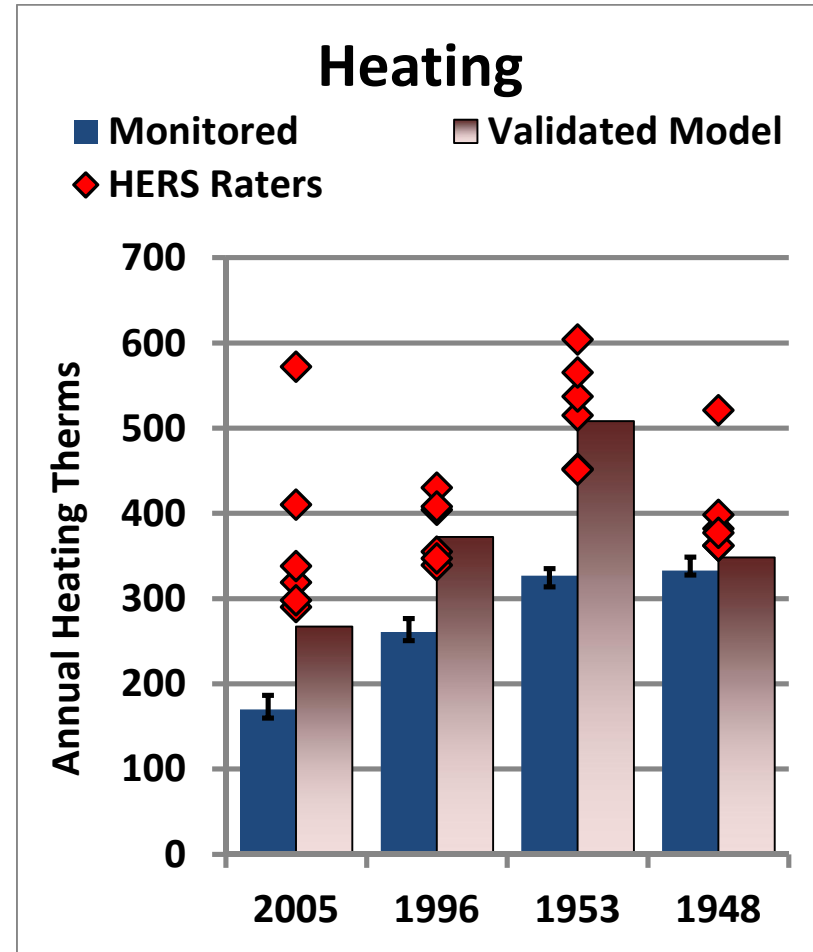
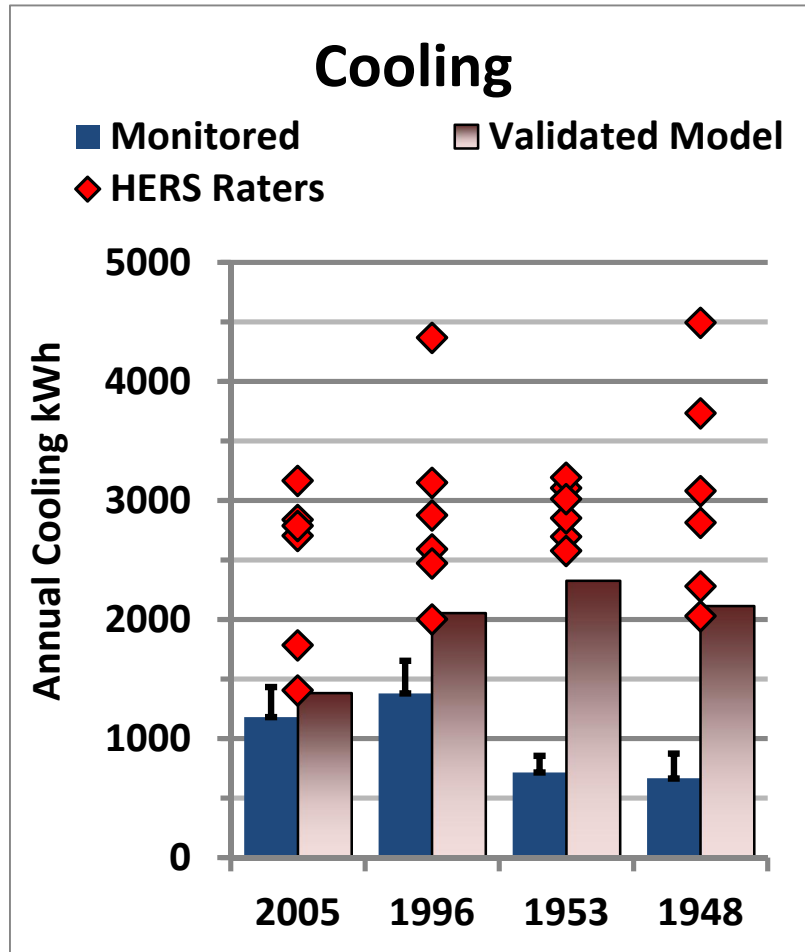


Daily Heating and Cooling Energy Use

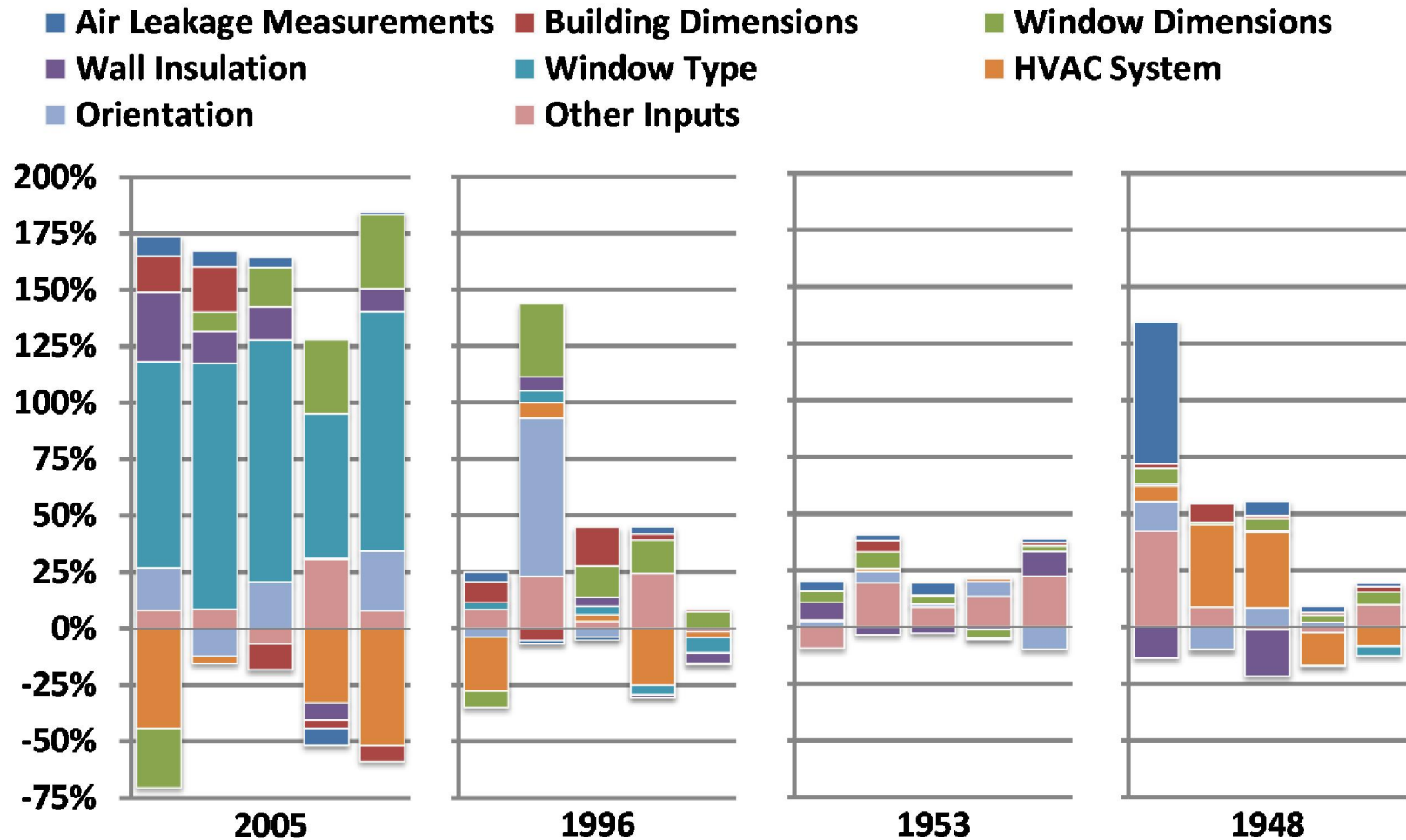


◆ Heating Therms ■ Cooling kWh

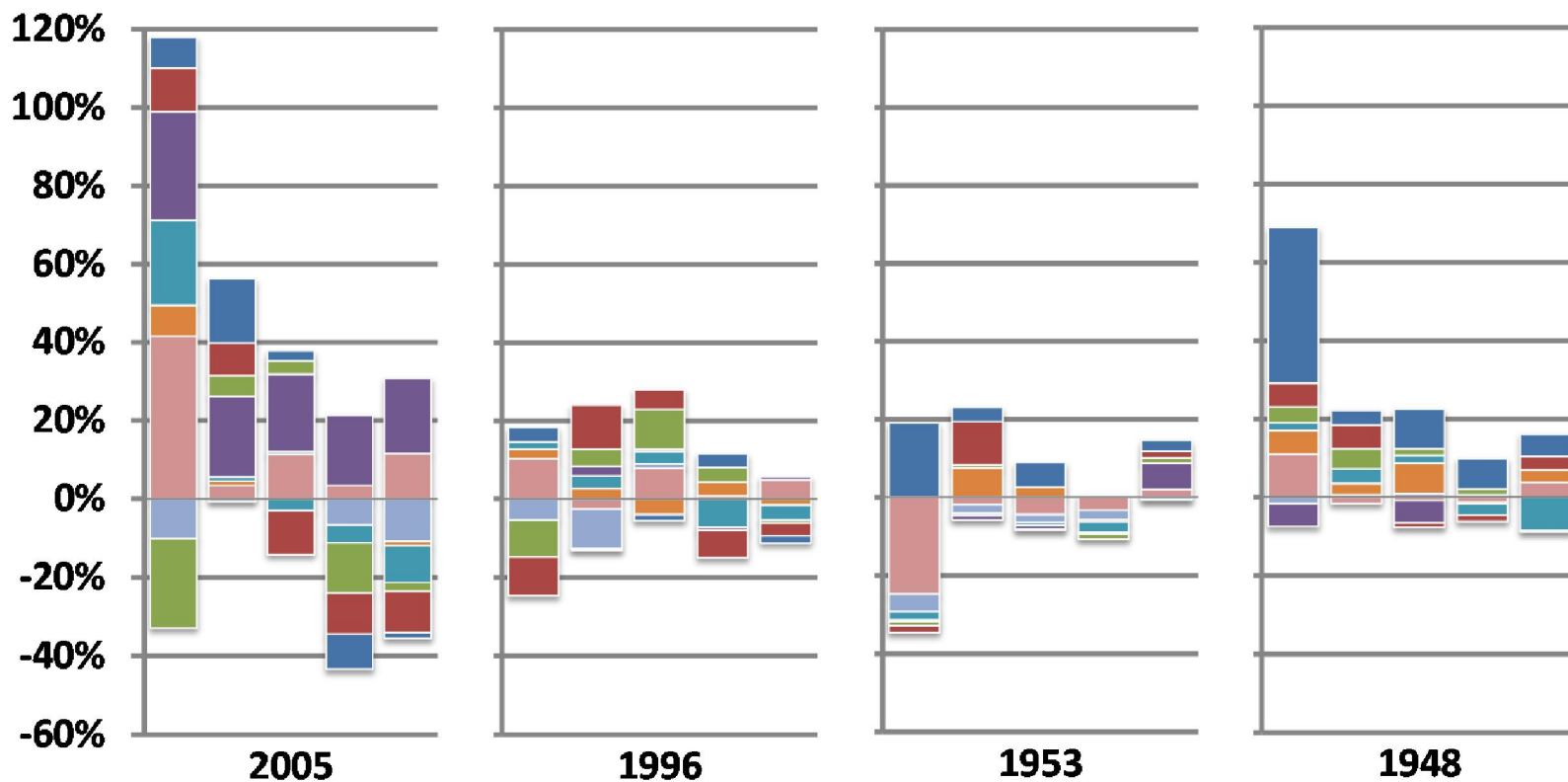
Estimated vs. Monitored Energy Use



Estimation Errors by Rater - Cooling



Estimation Errors by Rater - Heating



HERS: Reliable home energy advice or roll of the dice?

- Weighted dice
- Many types of errors
- Large errors (600% of monitored use!!!)
- Erratic performance is the norm

Recommendations

- Keep it simple
- Quality Assurance matters
- Consider demonstrated performance specific to your program's application
- More focus on the real world

More details, and a happier result

Central Valley Research Homes Project

Report to the California Energy Commission

Bruce Wilcox and John Proctor

>50% energy savings are possible