

INTEGRATING SMART GRID TECHNOLOGIES AND BUILDING PERFORMANCE:

*ASSESSING NEW AND EXISTING PROBLEMS IN RESIDENTIAL
BUILDINGS*

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OBJECTIVES & MOTIVATION

Motivation:

Smart Grid Technologies

Big Data



Effects on the Built

Environment

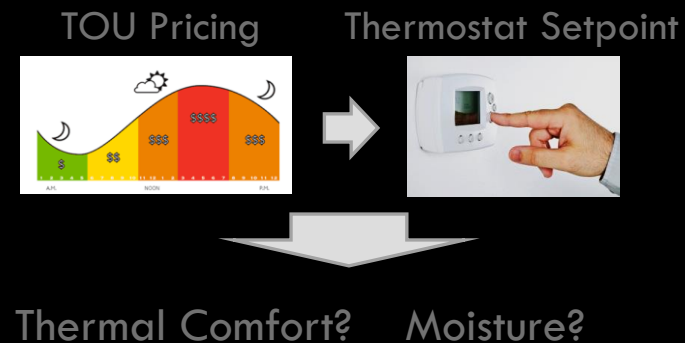


(1) Existing Problems in Buildings

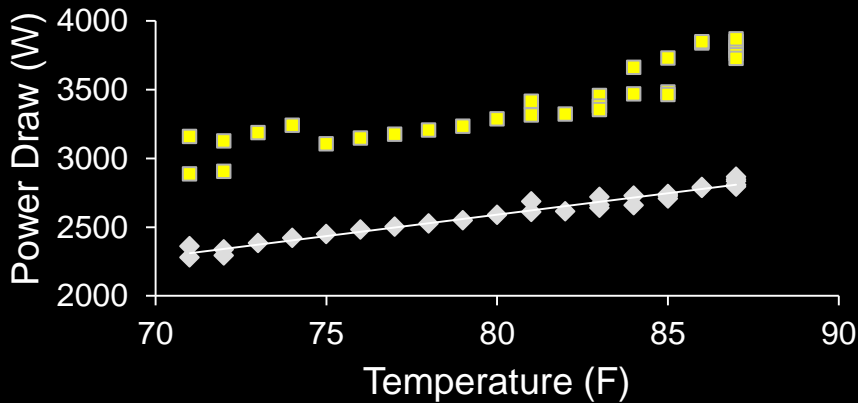
- Detect and diagnose faults

(2) New Problems Introduced ?

- Energy consumption with Smart Technologies
- Effects on the indoor environment ?



(1) EXISTING PROBLEMS IN BUILDING: DETECTING AND DIAGNOSING FAULTS



Prevention: Is there is a problem with my A/C ? How do I know?

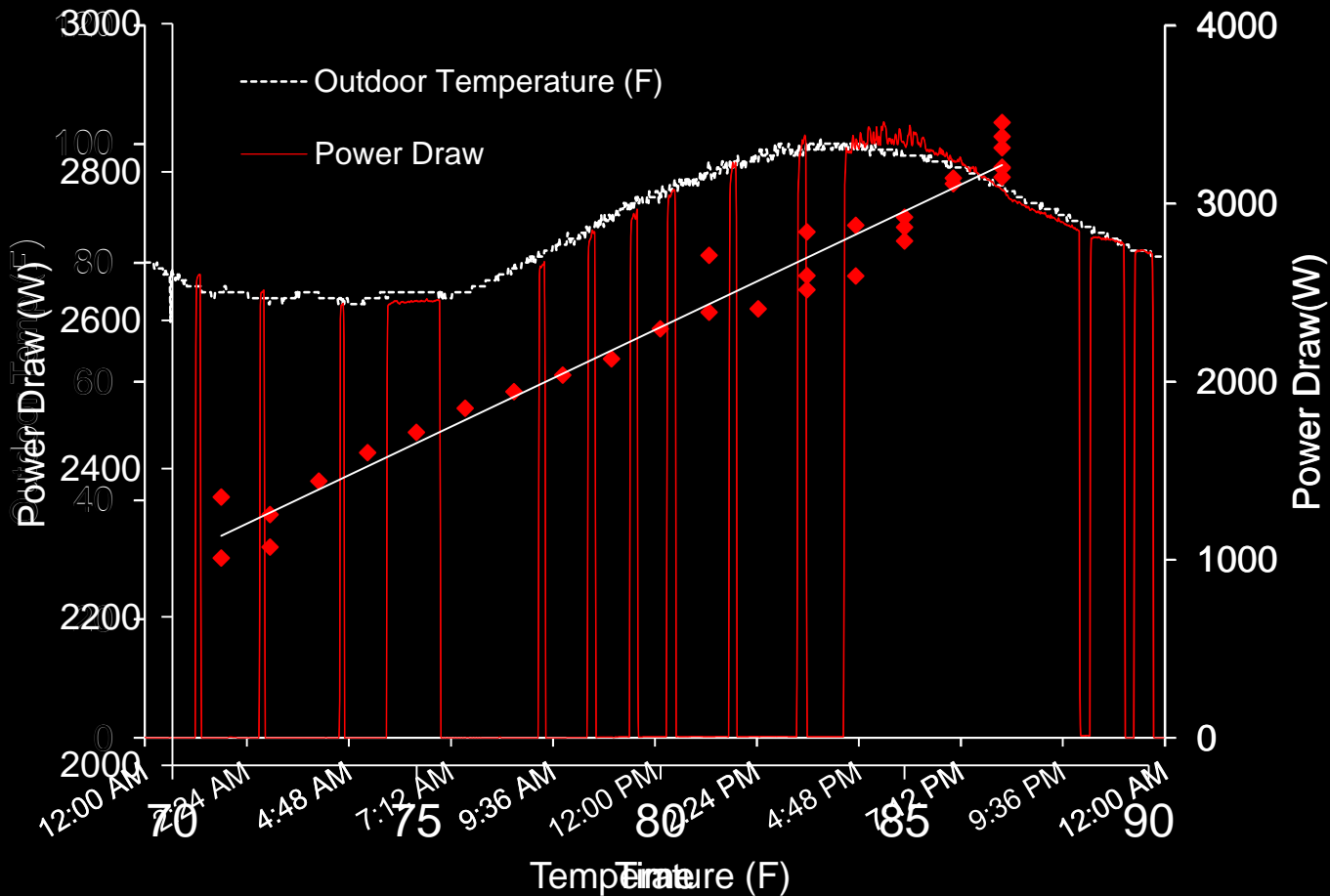
Diagnosis: A/C isn't working; A/C never turns off... What's going on?



Use energy and other “smart” data

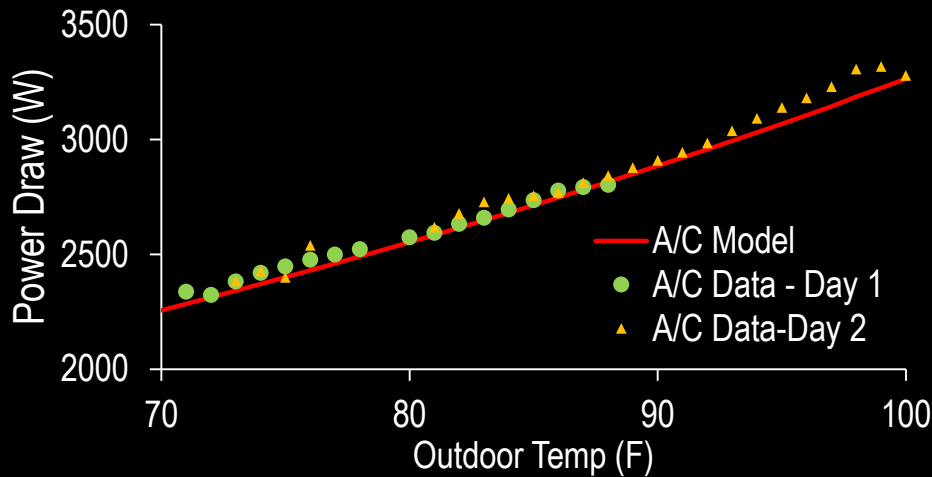
(1) EXISTING PROBLEMS IN BUILDING: DETECTING AND DIAGNOSING FAULTS

Air Conditioning Power vs. Outdoor Temperature

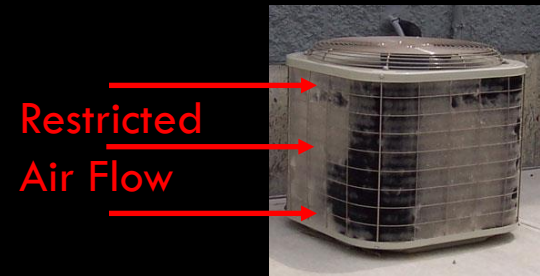


(1) EXISTING PROBLEMS IN BUILDING: DETECTING AND DIAGNOSING FAULTS

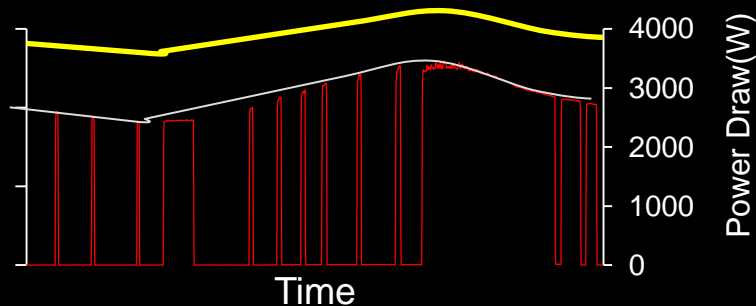
(a) Model for the A/C system



(b) Introduce Faults



(c) Predicted Change in Energy Use



(d) Verify with Testing

