

# Building Energy Simulation - Introduction

University of Maryland, College Park  
Mechanical Engineering Departments  
ENME808i / ENME424 – Urban Microclimate and Energy  
Spring Semester 2015

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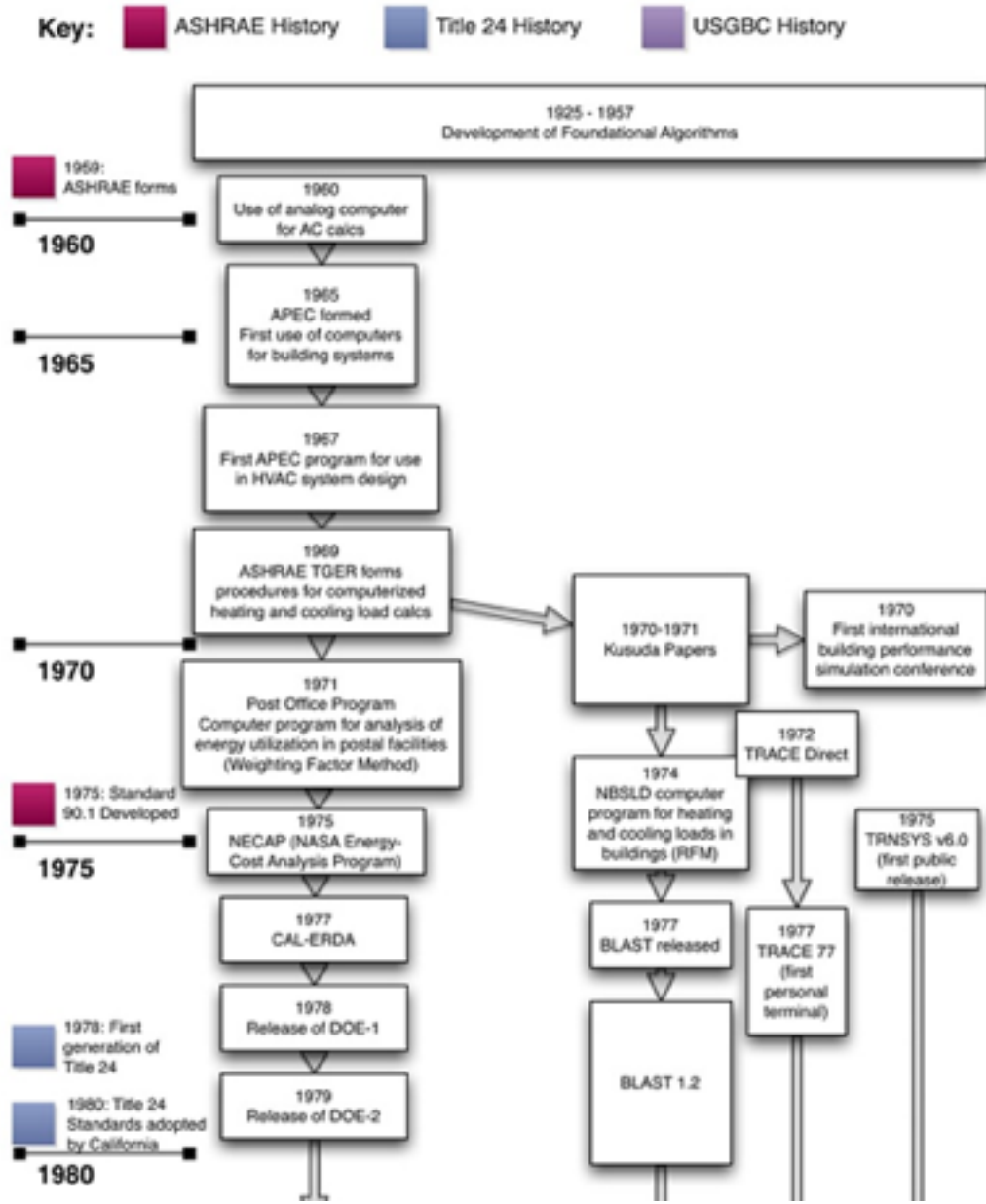


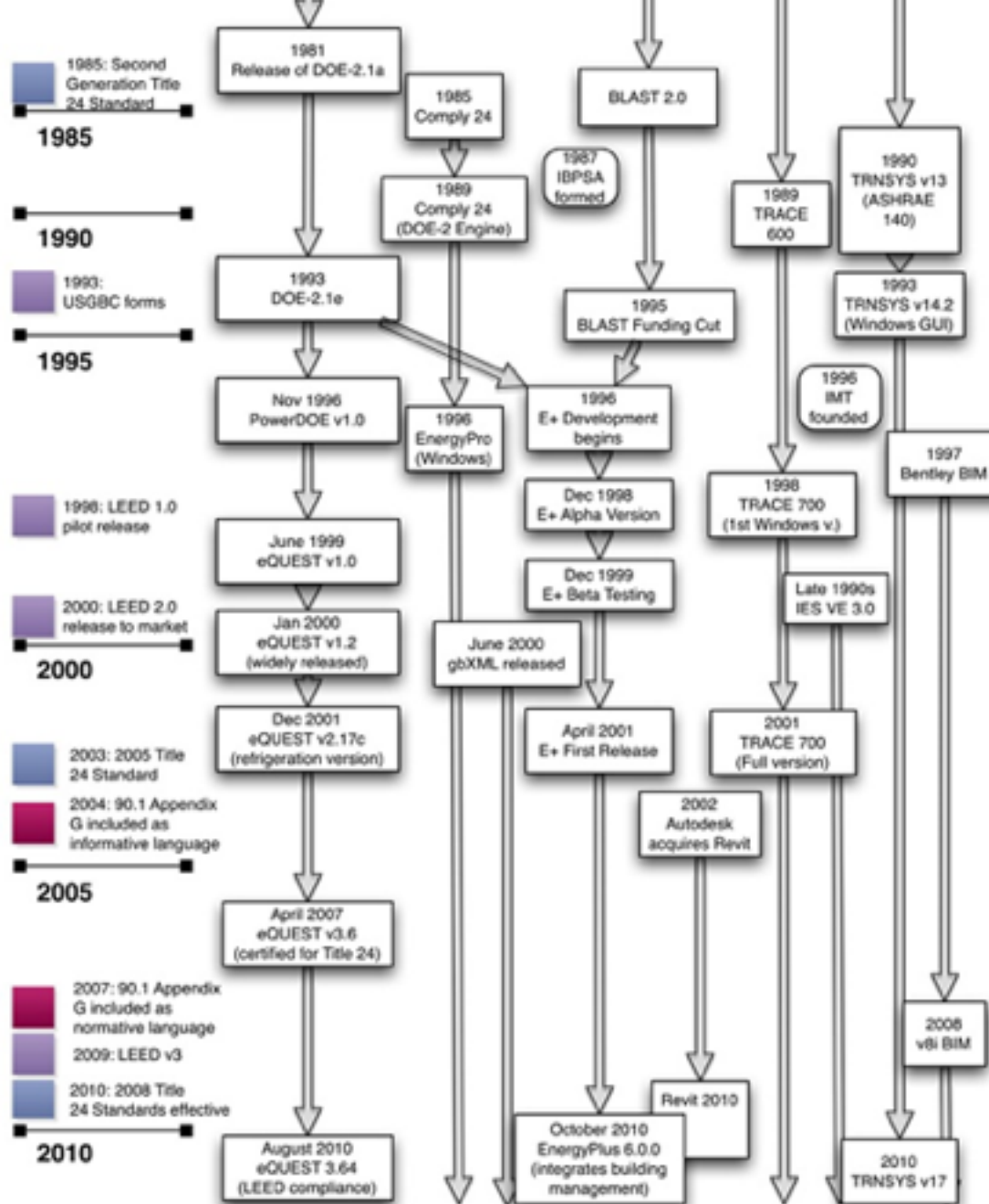
# Why Whole Building Energy Simulation?

- Building design improvement
- Thermal load calculation for equipment sizing
- Utility costs
- Thermal, Visual comfort
- Energy retrofit financial payback

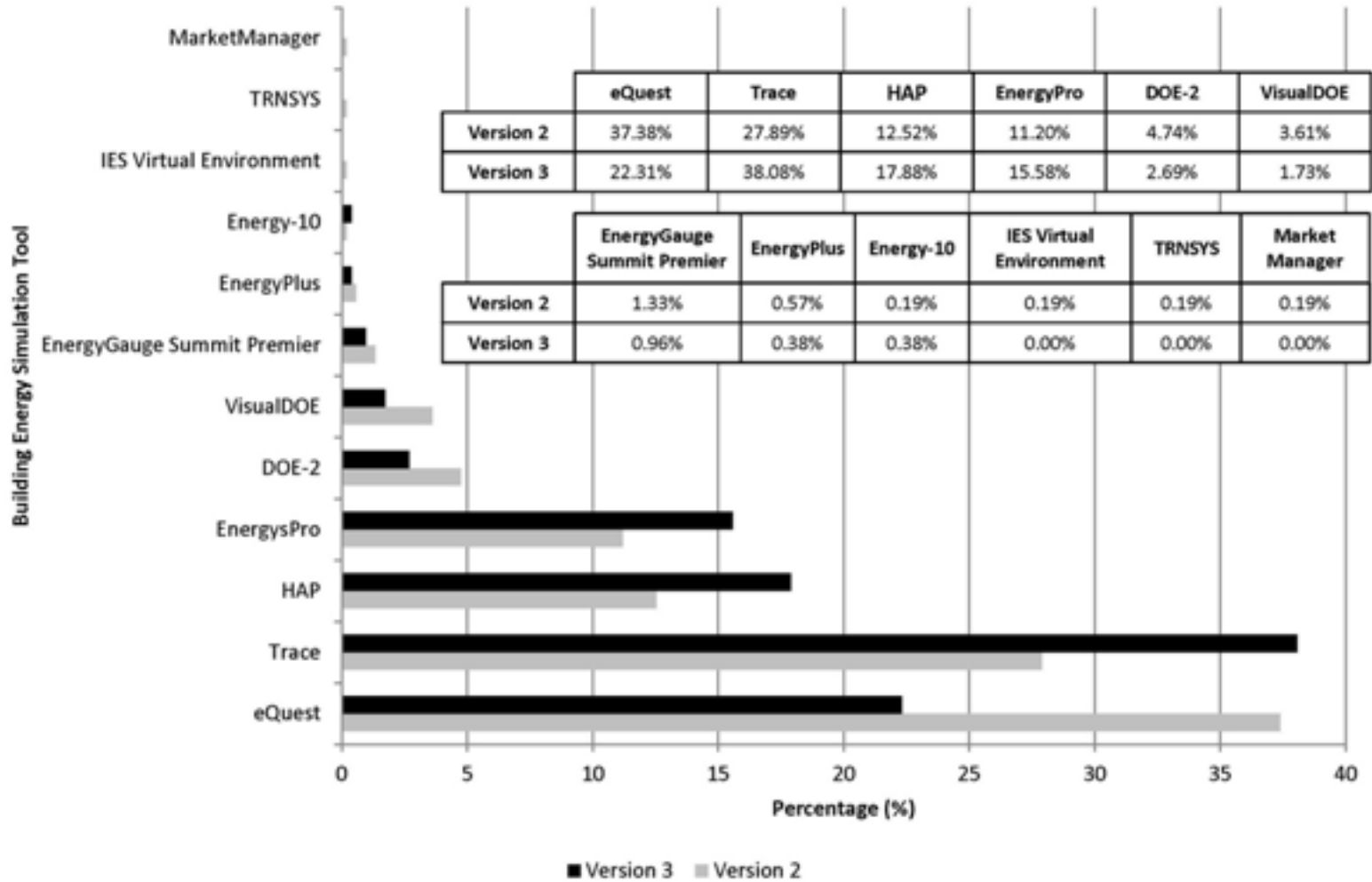


# History of Building Energy Modeling





# Energy Simulation Software Market Share for LEED



M Heidarinejad, M. Dahlhausen. 2013.



# Energy Simulation In Reality

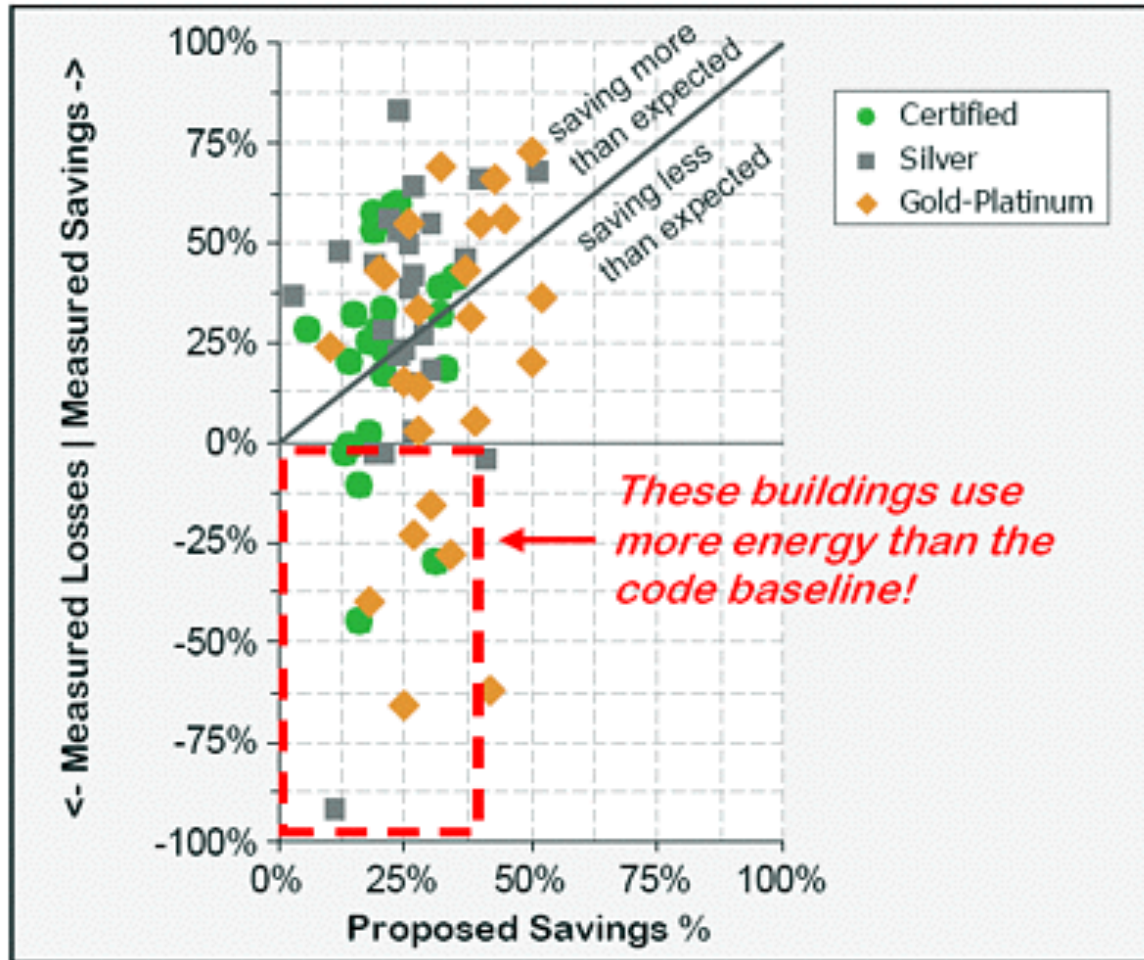


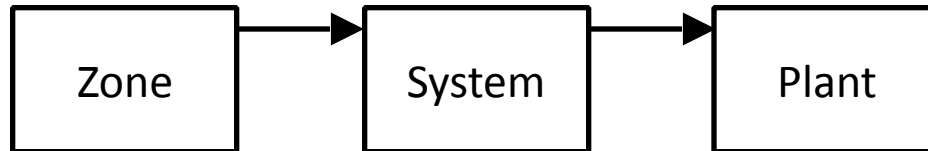
Figure ES- 5: Measured versus Proposed Savings Percentages

New Buildings Institute. "Energy Performance of LEED for New Construction Buildings". 2008



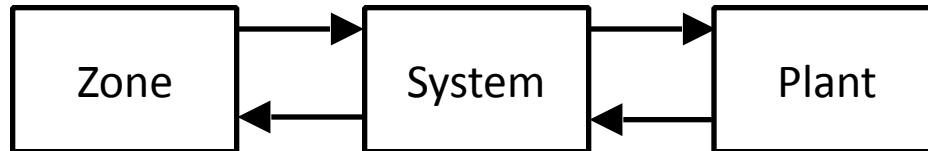
# EnergyPlus

- Integrated, Simultaneous Solver (loads/systems/  
plant)



# EnergyPlus

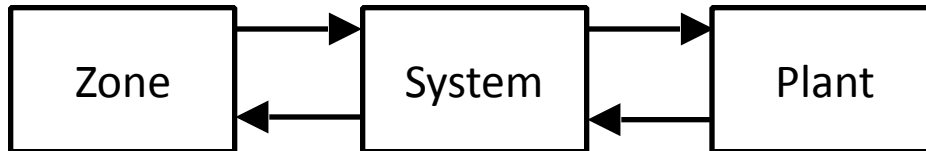
- Integrated, Simultaneous Solver (loads/systems/  
plant)





# History of EnergyPlus

- Integrated, Simultaneous Solver (loads/systems/  
plant)



- Anisotropic sky model
- Fenestration blinds, shades, dimmers, etc.
- Focus on simulation code, not GUI
- Modular code for easy additions

