



Bill Harrison



# ASHRAE Strategic Plan

- ⦿ **Strategic Direction # 1**
  - ASHRAE will lead the advancement of sustainable building design and operation*
- ⦿ **2007-2008 Focus on design**
- ⦿ **2008-2009 Focus on operation**



# Energy Waste

*A Real Problem... A Real Opportunity*



# Sustainability for ASHRAE

**Energy Efficiency**

***And***

**Healthy and Productive Indoor  
Environments**



# Improved Operating Strategies

- ⦿ **Energy Systems Lab - Texas A & M**
  - Save 10% to 40% energy
- ⦿ **Not product centered**
- ⦿ **Software and expert knowledge focused**
- ⦿ **Limited knowledge distribution**



# Improved Operating Strategies

- ⦿ **Lack of standardization**
- ⦿ **Minor changes use major energy**
- ⦿ **Wrong incentives for operators**
- ⦿ **No training programs**



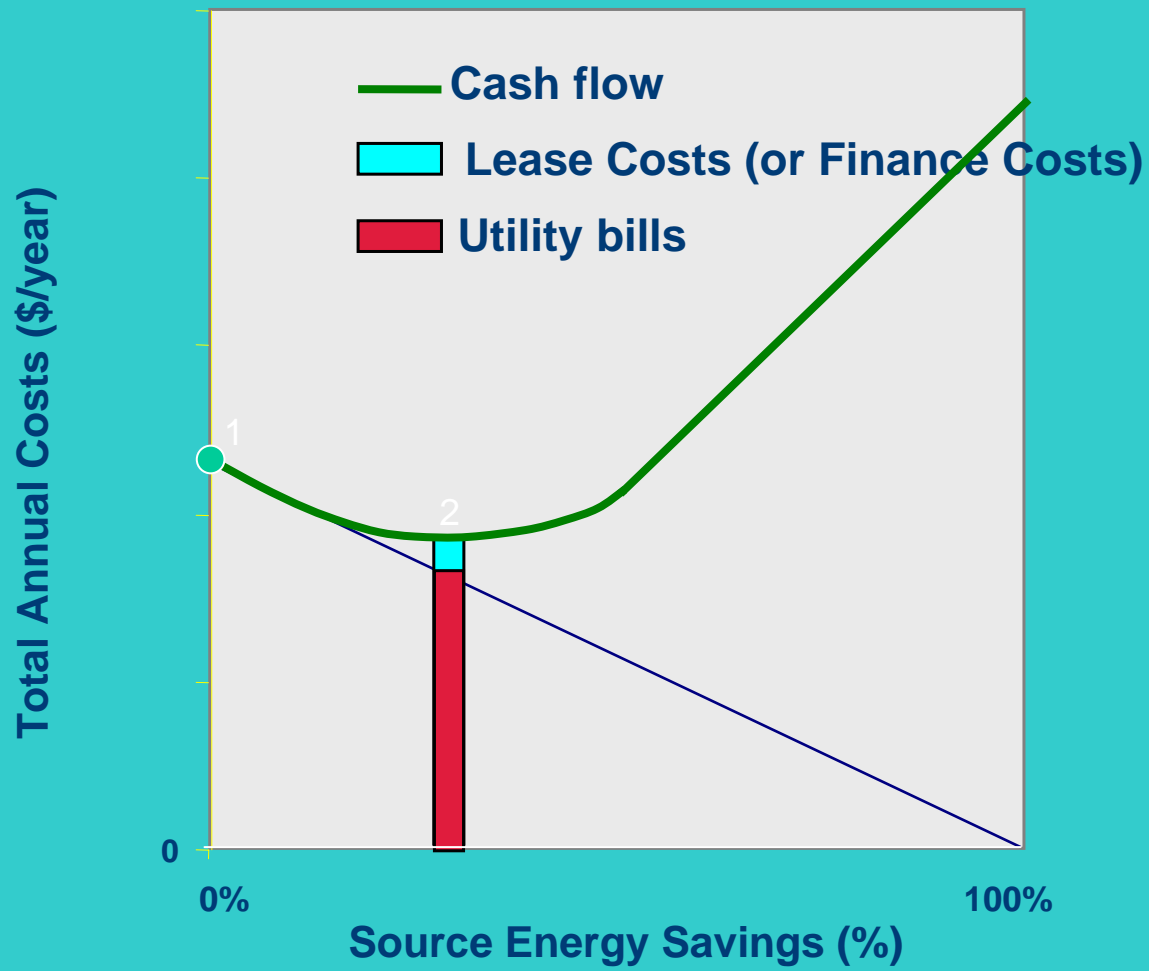
# Sustainability Challenge

- ⦿ **Six of top ten energy measures under control of architects**
- ⦿ **Integrated Building Design process essential**
- ⦿ **Communication - collaboration**
- ⦿ **“First Cost” mentality**
- ⦿ **Engineers: evil enablers**



## Owner Issues

- ⦿ **Life Cycle Costing**
- ⦿ **Equipment room sizing**
- ⦿ **Engineers need to deliver energy message**
- ⦿ **Energy cost implications**
- ⦿ **Building Commissioning**





# Operator Training

- ⦿ **Local chapter program**
- ⦿ **HVAC fundamentals**
- ⦿ **High performance products and systems**
- ⦿ **1980's training produces 1980 results**



# High Performance Building Design

**Energy Modeling  
Building Narrative**



# High Performance Building Design

**A larger budget for planning and  
design produces lower  
construction costs and lower  
operating costs**



# The Cost of Owning HVAC

- ⦿ **Capital costs**
- ⦿ **Utility costs**
- ⦿ **Repair costs**
- ⦿ **Replacement costs**
- ⦿ **Maintenance costs**



# Maintenance Plans

- ◎ **ASHRAE Guideline 4 – 2008**
  - ◎ **Preparation of Operating and Maintenance Documentation for Building Systems**
- ◎ **CIBSE Guide M – 2008**
  - ◎ **Maintenance Engineering and Management**
- ◎ **Must include energy budgets and energy reporting**



# Maintenance Strategies

- ⦿ **Develop proper documentation**
  - ⦿ **ASHRAE Guideline 4**
- ⦿ **Keep equipment clean**
- ⦿ **Don't accept dirty equipment**
- ⦿ **Maintenance management software**
- ⦿ **Monitor energy use**
- ⦿ **In house / outsource**
  - ⦿ **Training capabilities**



# The Buildings Business

- ⦿ **Largest user primary energy**
- ⦿ **Improved building operations**
  - ⦿ **10% to 40% energy savings**
- ⦿ **Local educational programs by ASHRAE chapters**
- ⦿ **Keep our green buildings green**



# Global CO2 Emissions

- ⦿ **2008: 30 Billion Metric Tons**
- ⦿ **2030: 42 Billion Metric Tons**



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