

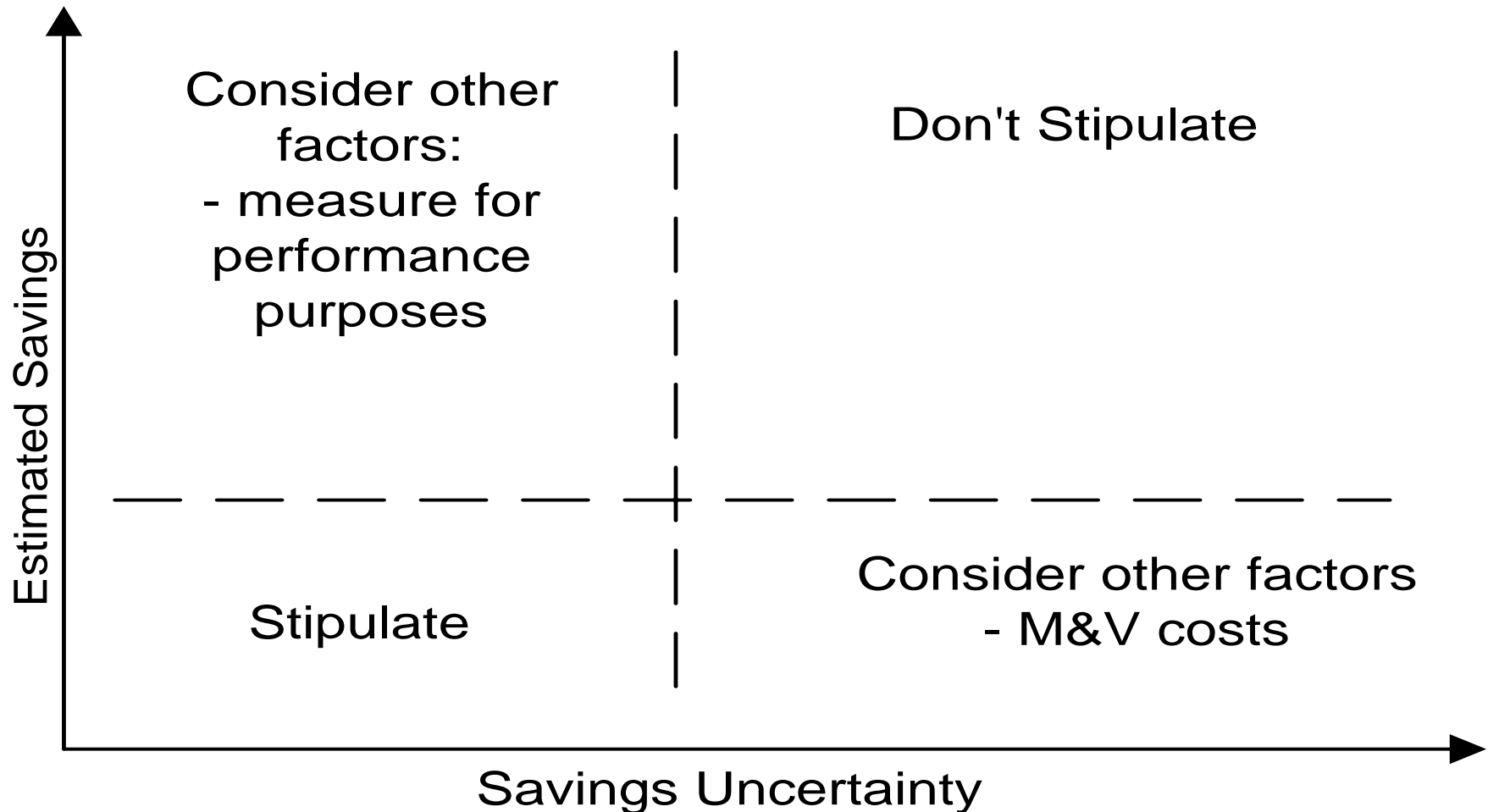
EPC PRESENTATION

**By Dave Birr
President
Synchronous Energy, Inc.**

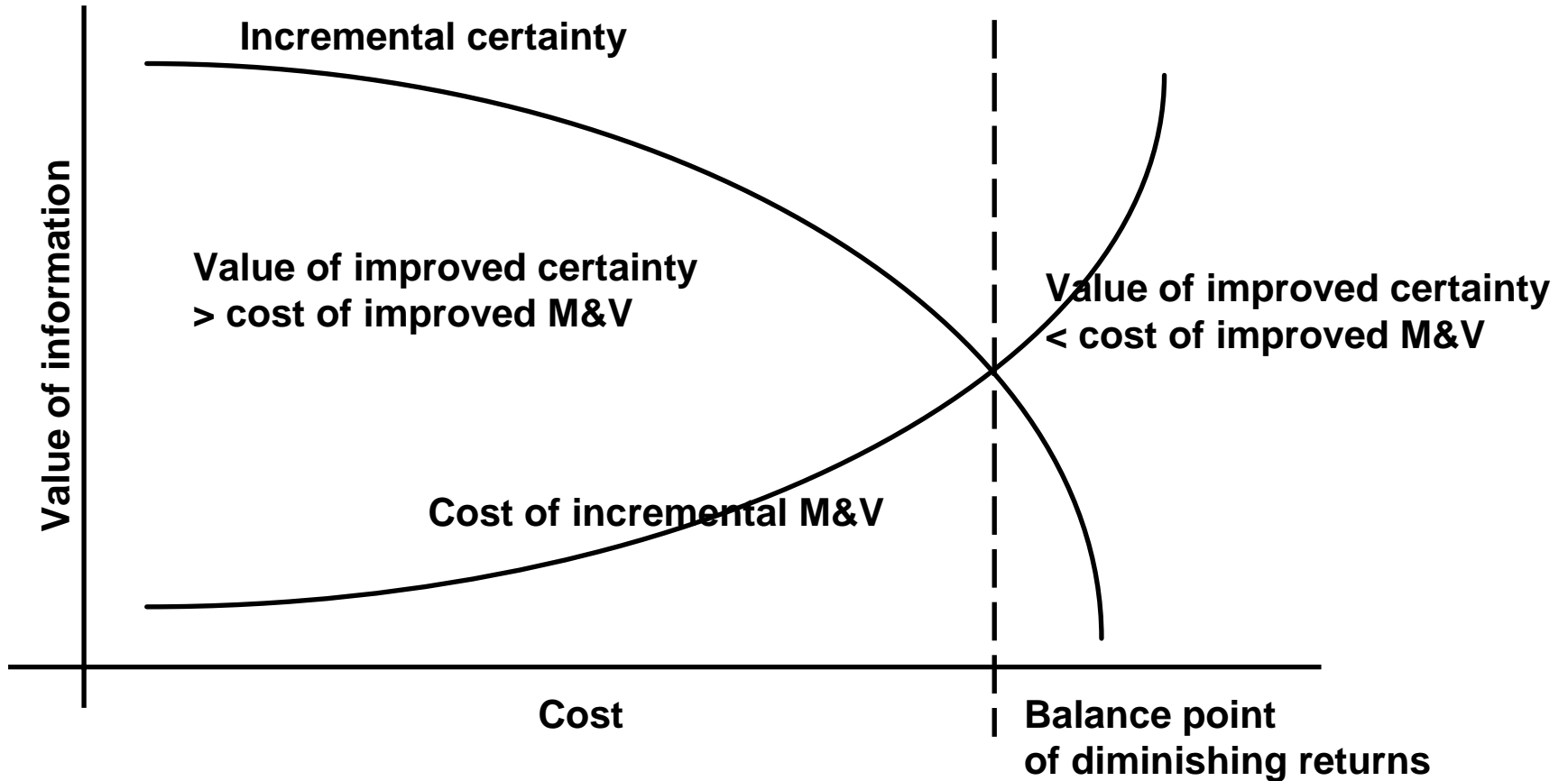
October 24, 2007

Is Stipulation Appropriate

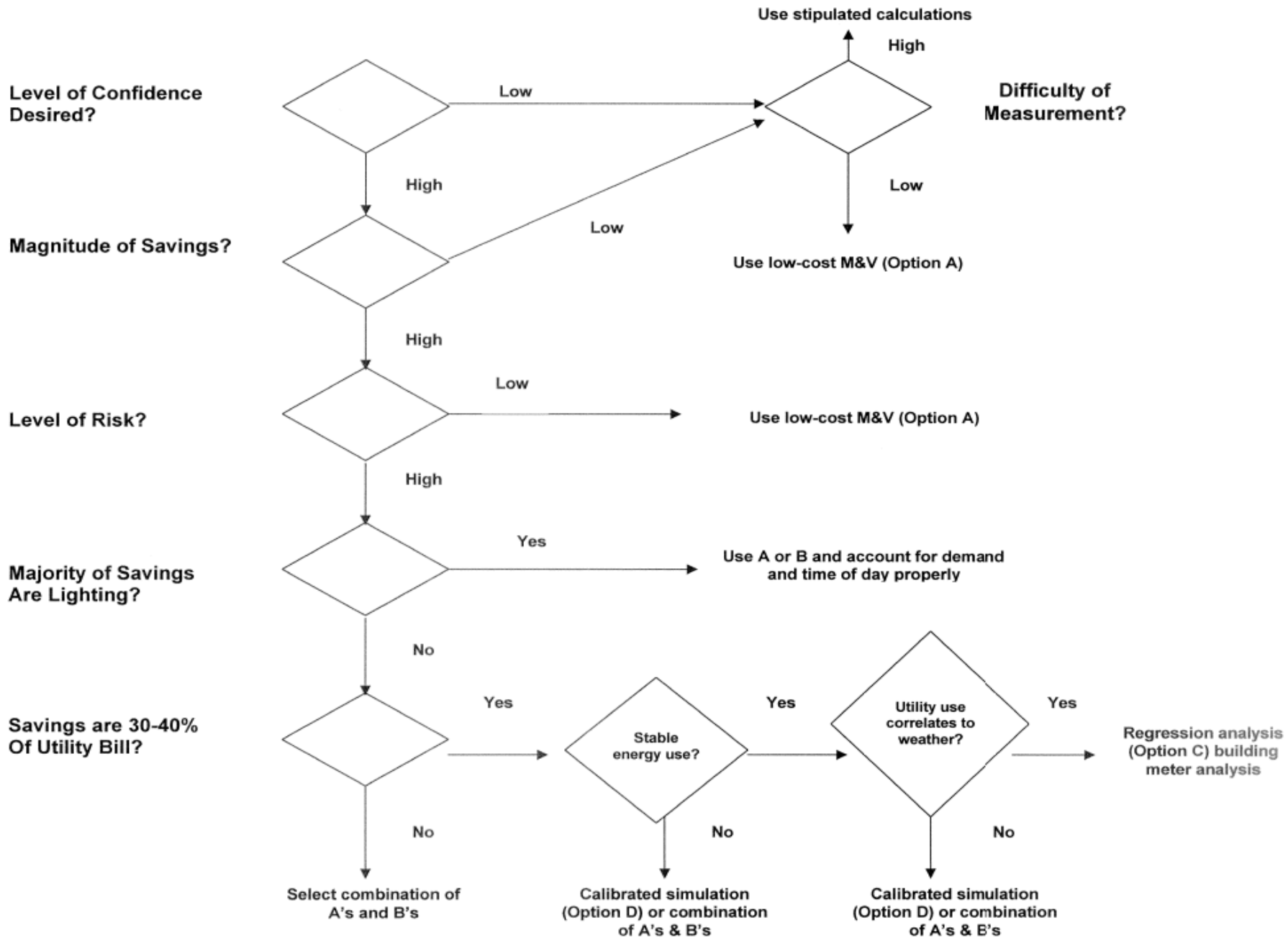
- Stipulating savings vs. stipulating specific parameters
- Reality: M&V costs money. If money was not an issue, no need to consider stipulation



How Much M&V is Enough?



M & V DECISION PROCESS



Inside the ESCO Business

BEWARE:

ESCOs can grow a project beyond practical limits:

- Increasing owner's share of risk
- False sense of guarantee

Method 1: Using non-verifiable savings

Method 2: Using cost escalations

Method 3: Using inaccurate energy unit costs

Method 4: Using 100% of projected savings

Method 5: Using loose contract language

Performance Guarantees Verifiable or Not?

Types of Savings

1. Energy
 - Tariff
 - Efficient Equipment
 - Efficient Operating Methods
2. Operational & Maintenance
 - Labor
 - Material
 - Tools / Equipment
 - Service Contracts
3. Capital Avoidance

Which are guaranteed by an ESCO?

Misapplied guarantees and aggressive stipulated (or non-measured) savings have led to litigation in some states

This damages the marketplace and creates unnecessary risk

The Attorney Generals in Florida and Louisiana have issued advisory rulings about non-compliance with state statutes

What is Being Guaranteed?

Mutually agreed billable usage increase

“Guarantee the accuracy of all meters at 98.5% in the first year, degrading by 0.3% in the second year and an additional 0.3% every year after”

BADGER METER EXTENDED LOW FLOW METER ACCURACY

Badger Meter further warrants the meter product to meet or exceed the following extended low flow accuracies in excess of AWWA standards:

Model 25 Recordall 5/8" and 5/8" x 3/4"

Badger warrants Product low flow accuracy of 98.5% at a rate of 1/4 gpm for five (5) years from date of shipment or registration of 675,000 gallons, whichever occurs first.

AWWA METER ACCURACY

The meter product will meet or exceed new meter accuracy standards set forth in AWWA Standard C700-02 for the following periods:

Model 25 Recordall 5/8" and 5/8" x 3/4"

Five (5) years from date of shipment or registration of 750,000 gallons, whichever occurs first.

“No guarantee, either express or implied, as to the actual revenue to be achieved post-retrofit since actual revenues are impacted by variables outside the control of ESCO”

Conclusions

What is Being Guaranteed?

- Nearly 75% of benefits are “stipulated” and never measured
- Capital dollars will be spent regardless of performance contract
- Mfr. provides “meter accuracy guarantee” at no cost

Cost of Guarantee

- Other price-based procurements indicate a potential savings of more than \$2M versus performance contract
- This is a very expensive “guarantee”

Procurement Process

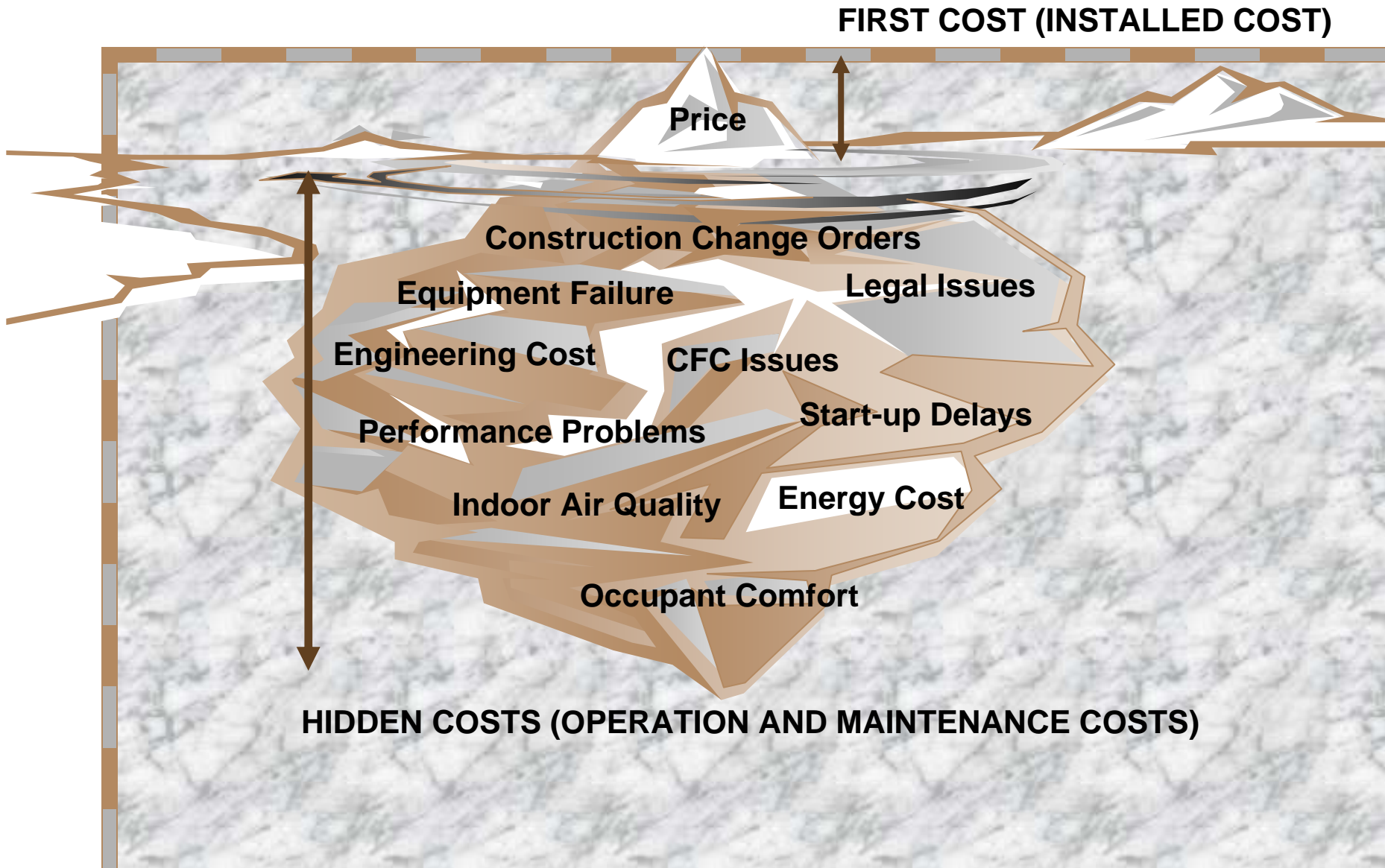
- Attorney General ruling documents non-compliance
- Previous ESCO litigation in Louisiana and Texas
- We don't need the same thing in other states

Retro-Commissioning

Good candidates for Retro-Commissioning:

- **Complex mechanical and/or control systems**
- **Energy consumption exceeds benchmarks**
- **History of operating problems**
- **High air change rates, VAV systems**
- **Submetering or data collection system**
- **Historical load profile data, baseline data**
- **Motivated and capable facility staff**

Total Life Cycle Costs



ESPC Projects Potential LEED- EB Points

- **Exceeding ASHRAE 90.1-1999 (Energy Standard)**
- **Meeting ASHRAE 62-1999 (Ventilation)**
- **Building Commissioning**
- **IPMVP Option B--Continuous Metering**
- **Exceeding ASHRAE 129-1997 (Ventilation)**
- **Compliance with ASHRAE 55-1992, addenda 1995 (Thermal Comfort)**
- **Demand Control Ventilation (DCV) by using CO₂ Monitoring**

Traditional LCC Analysis

$$\text{LCC} = I + S + O + M + E + R$$

- I = Investment
- S = Salvage Value
- O = Operation Costs
- M = Maintenance Costs
- E = Energy Costs
- R = Replacement Costs

Green LCC Analysis

$$\text{GLCC} = (I + S + O + M + E + R) + (H + EV + P)$$

- H = Health Costs
- EV = Environmental Costs
- P = Productivity Costs

**But can we quantify the
GLCC factors?**

- **Are we only going to measure quantitative building performance against well defined standards?**
- **Are we going to begin seriously measuring the impacts of building performance on human performance?**

- **How do we create credible baseline data on maintenance costs?**
- **How are we going to quantify the value created for the utility system as a whole by ESCO projects?**

Areas Where Energy and IAQ Conflict

- **Temperature setpoints**
- **Humidity control**
- **Operating schedules**
- **Outside air quantities**

Areas Where Energy and IAQ Goals Coincide

- **Calibrated controls**
- **Balanced air distribution**
- **Clean coils and filters**
- **Single VAV box serving single space**

Other Factors Affecting IAQ

■ Lighting

- Major consumer of energy (29%)
- Adequate lighting levels
- Unobtrusive equipment
- Proper quality

■ Noise

- HVAC system, occupants, other sources
- Attenuate unwanted noises

Trade-Offs

- **Temperature and humidity versus productivity**
- **Temperature versus relative humidity**
- **Relative humidity versus cleanliness**
- **Formaldehyde effects on visual sensitivity**

Proactive Monitoring Program

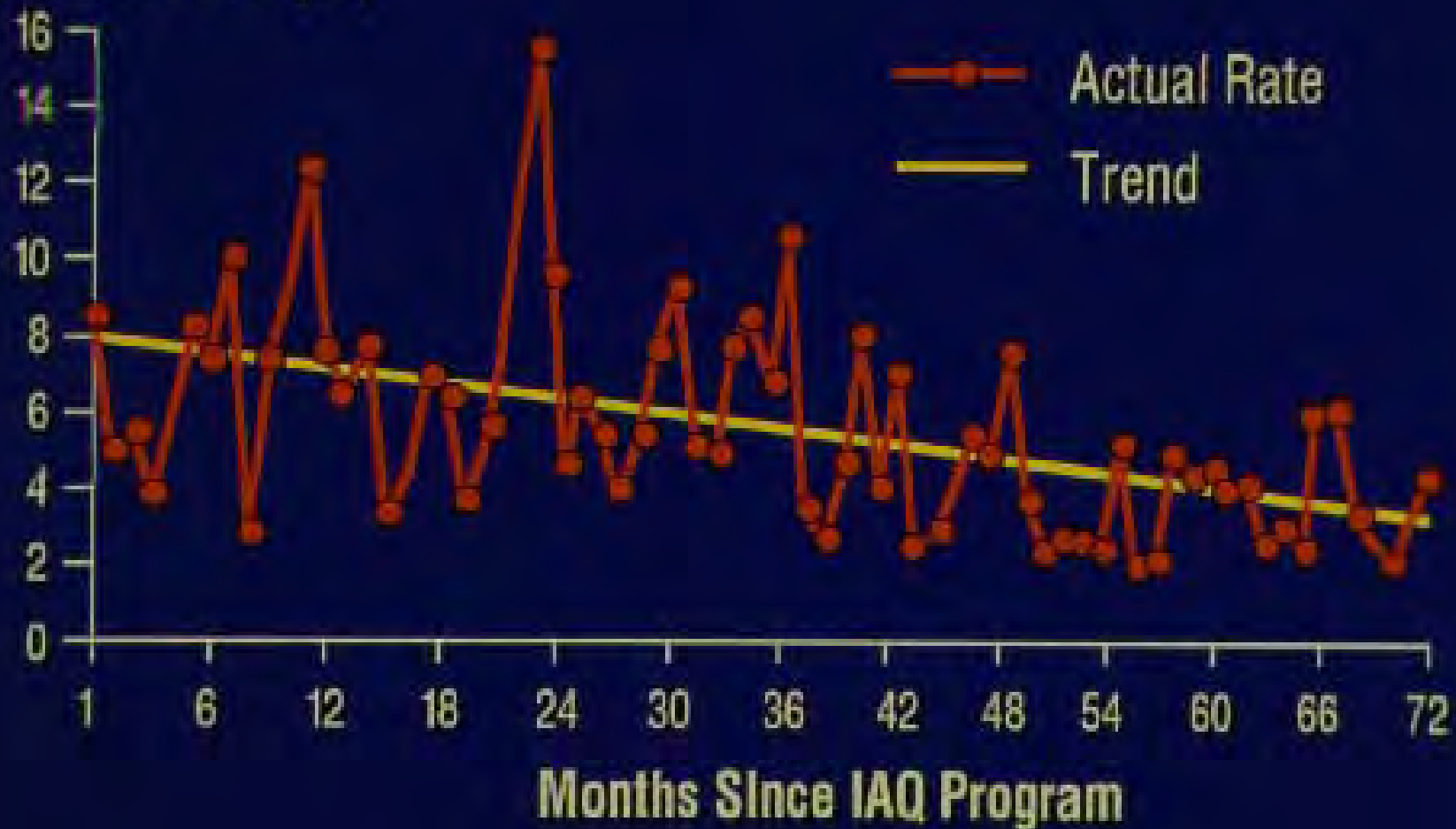
- **CO₂**
- **CO**
- **Temperature**
- **RH**
- **Organic and inorganic gases**
- **Airborne bacteria and fungi**
- **Airborne particulates**

IAQ Proactive Maintenance Program

- **Visual inspection of air handlers**
- **Supply, return, and outdoor air quantities**
- **Air filter check**
- **Nighttime purging with outdoor air**
- **Increased ventilation to office areas**
- **Improved ventilation efficiency**
- **IAQ training for maintenance staff**

Thermal Complaint Rate

Compliance Rate (%)



Elements of an IAQ Profile

- **Original design**
- **Current operation**
- **Impact of changes**
- **Future modifications**

Why an IAQ Profile?

- Provides baseline information
- Identifies potential problem areas
- Prioritizes maintenance and future upgrades
- Part of “Owners Manual” when combined with other building information