

Standard for the Design of High-Performance Green Buildings

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www.ashrae.org/greenstandard

ASHRAE/USGBC/IES Standard 189.1-2009

Agenda

- **Introduction to what 189.1 is (and isn't), including brief overview of technical content**
- **Status of where the standard is in the development and approval process**
- **Request to members and chapters to “spread the word” about the standard, encouraging use and adoption of standard**
- **Q & A**

What is Standard 189.1?

- **ANSI standard being developed in model code language**
- **Provides minimum requirements for high performance, green buildings**
- **Applies to all buildings except low-rise residential buildings (same as ASHRAE/IESNA Std 90.1)**
- **Not a design guide, not a rating system**

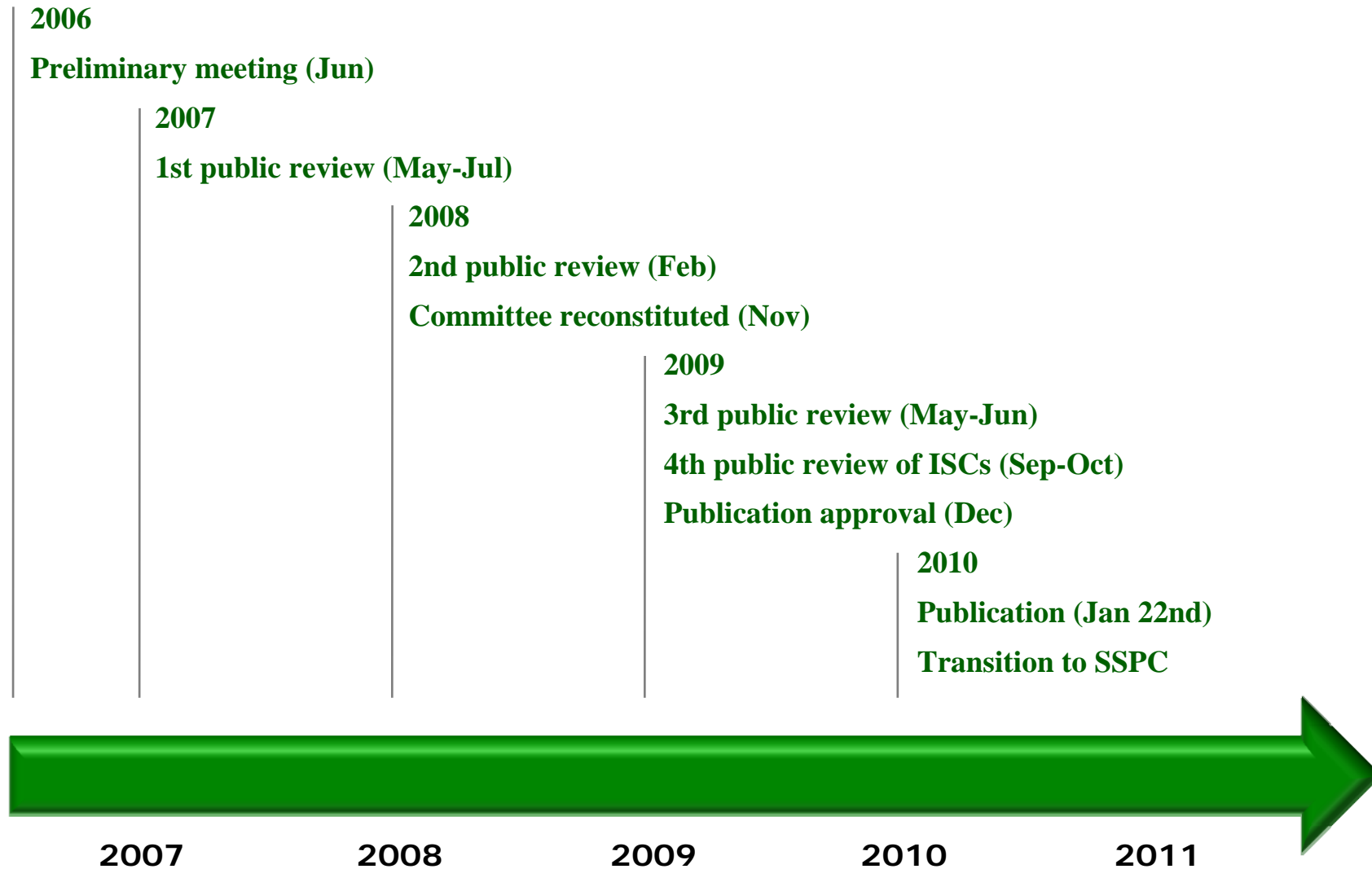
Standard Project Committee 189.1

- **Sponsor and co-sponsors**
 - ✧ **ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers**
 - ✧ **USGBC – U.S. Green Building Council**
 - ✧ **IES - Illuminating Engineering Society of North America**
- **Project committee**
 - ✧ **37 total members**
 - ✧ **Diverse backgrounds**
- **Consensus process**

Goals for Standard 189.1

- **Establish mandatory criteria in all topic areas**
 - ✧ **One “challenge” is existing green building rating systems contain few mandatory provisions**
- **Provide simple compliance options**
- **Complement green building rating programs**
 - ✧ **Standard is not intended to compete with green building rating programs but to support them**

Development of Standard 189.1



Status of Standard 189.1-2009

- **Approved for publication by:**
 - ✧ **Project committee (SPC 189.1)**
 - ✧ **ASHRAE Leadership, including Board of Directors**
 - ✧ **USGBC**
 - ✧ **IES**
- **Right to appeal - unresolved commenters**

Status of Standard 189.1-2009

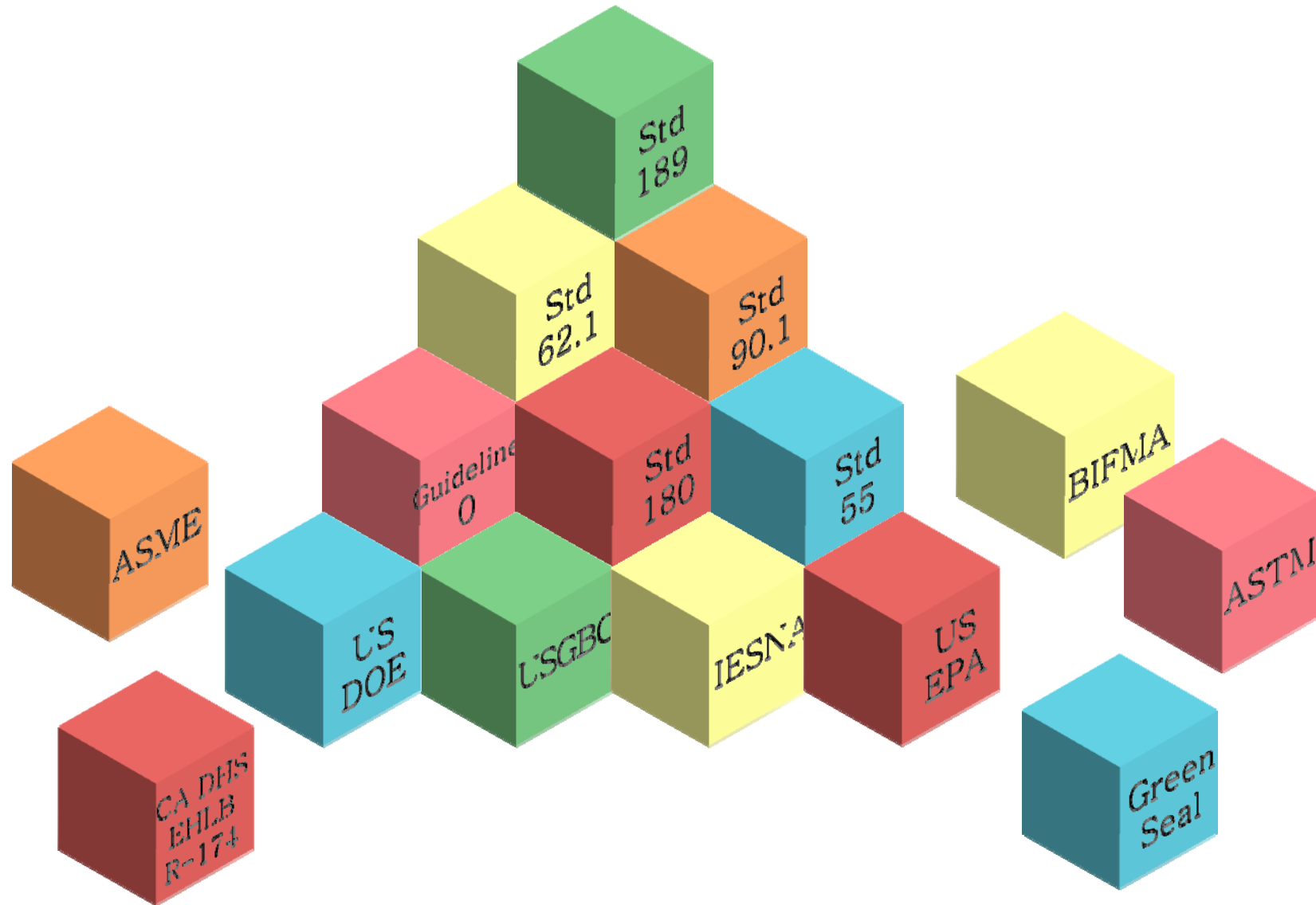
- **Published standard on January 22, 2010**
- **Appeals are under consideration at ANSI**
- **Membership applications are currently being accepted for SSPC 189.1 for Continuous Maintenance and further development of the Standard.**

What Happens When Green Becomes Code?



Do Buildings Get Better?

Standard 189.1 Building Blocks



Compliance Paths



Standard 189.1 Topic Areas

- SS** Sustainable Sites
- WE** Water Use Efficiency
- EE** Energy Efficiency
- IEQ** Indoor Environmental Quality
- MR** Building's Impact on the Atmosphere, Materials & Resources
- CO** Construction and Operations Plans

Sustainable Sites Highlights

1. Site Selection
2. Reduce heat island effect
3. Reduce light pollution



Water Use Efficiency Highlights



- **Site Water Use**

- ✧ **Bio-diverse plantings, hydrozoning, & smart irrigation controllers**

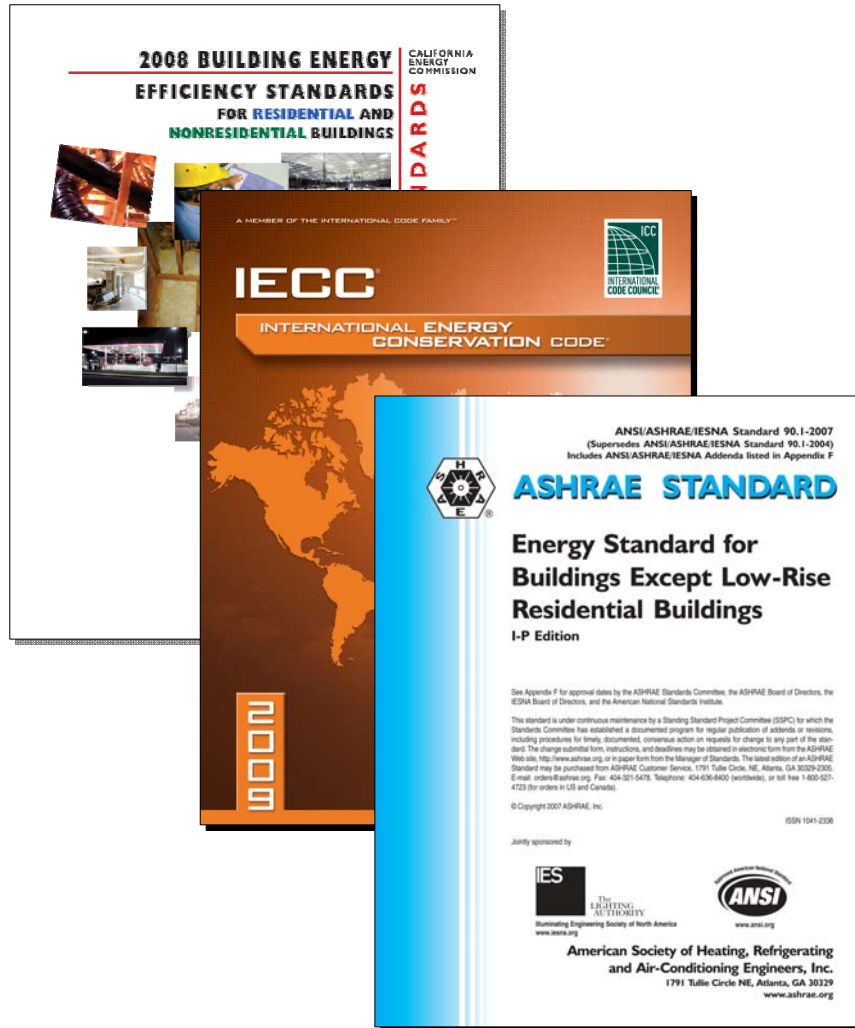
- **Building Water Use**

- ✧ **Plumbing fixtures & fittings, appliances, HVAC systems & equipment, generally 40% lower than U.S. EPA Act 1992**
- ✧ **Cooling tower maximum cycles of concentration**

- **Water Measurement for building and subsystems**



Building Energy Codes



Energy Efficiency Highlights

- **More energy efficient than Standard 90.1-2007**
- **Includes Plug and Process Loads**
- **Renewable energy provisions**
- **Energy measurement for verification**
- **Electric peak load reduction**



Energy Efficiency Renewable Prescriptive Requirement

- **On-site renewable energy systems**
 - ✧ Annual energy production equivalent of 20 kWh/m² of conditioned space
 - ✧ Exception for areas with incident solar radiation less than 4 kWh/m²-day and a cumulative purchase of green power of 750 kWh/m² for a period not to exceed ten years



Energy Efficiency

■ Prescriptive Option

■ Lighting

- ✧ Interior lighting power to be 10% less than the 90.1-2007 lighting power density
- ✧ Occupancy sensor controls
- ✧ Occupancy sensor controls with multi-level switching or dimming
- ✧ Lighting for building security or emergency egress $\leq 0.1 \text{ W/ft}^2$
- ✧ Automatic controls for lighting in daylight zones



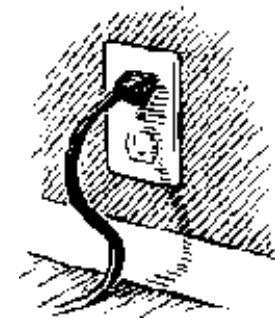
Energy Efficiency

■ Prescriptive Option

■ Other Equipment

- ✧ Motor efficiencies higher than Standard 90.1-2007
- ✧ Supermarket waste heat recovery system on permanently installed refrigeration equipment in supermarkets 25,000 ft² or greater
- ✧ Energy Star equipment and appliances if installed prior to issuance of certificate of occupancy
- ✧ Commercial refrigerators, freezers and clothes washers to comply with

Appendix C



Energy Efficiency

■ Performance Option

■ Annual Energy Cost

- ✧ Proposed \leq mandatory plus prescriptive
- ✧ Normative Appendix D – Performance option for energy efficiency

■ Annual Carbon Dioxide Equivalent (CO₂e)

- ✧ Proposed \leq mandatory plus prescriptive

■ Peak Electric Demand

- ✧ Proposed \leq mandatory plus prescriptive
- ✧ Minimum annual load factor of 0.25



Indoor Environmental Quality Highlights



■ Indoor Air Quality

- ✧ Ventilation rates per ASHRAE Standard 62.1
- ✧ Outdoor air flow rate monitoring of minimum outside air
- ✧ MERV 8 filter (MERV 13 in PM_{2.5} non-attainment areas)
- ✧ No smoking inside building
- ✧ Source contaminant control

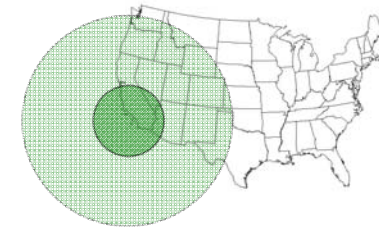
■ Daylighting

■ Acoustical Control



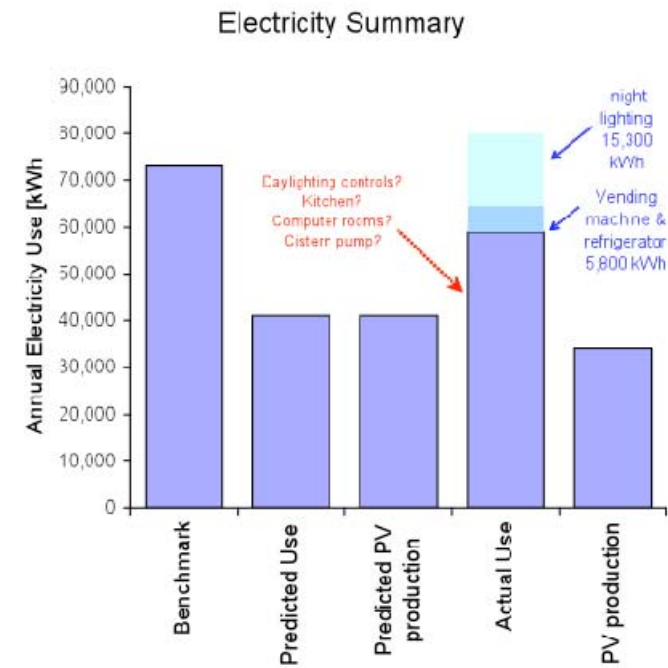
The Building's Impact on the Atmosphere Highlights

- **Construction waste management**
- **Reduced Impact Materials**
- **Wood products**
- **Refrigerants**
- **Storage and collection of recyclables and discarded goods**



Construction and Operation Highlights

- Acceptance Testing / Commissioning (> 500 m²)
- IAQ Construction Management Plan
- Plans for Operation
 - ✧ High-performance building operation
 - ✧ Maintenance
 - ✧ Service life
 - ✧ Transportation management



The Role of ASHRAE in Public Policy

ASHRAE's Mission:

To advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world.

- **ASHRAE knowledge base is important to society**
- **Technical, unbiased resource to decision makers**
- **Policy decisions are made in our countries and local communities**
- **Others continue to address issues; ASHRAE must be engaged to help our local communities understand these issues**

What is Your Best Path Forward?

- **Begin to understand the impact of these new requirements on your chapter members and local communities**
- **Identify what requisite skills and knowledge your chapter members will need once this standard and green codes are implemented**
- **Share your knowledge and experience with policymakers who will ultimately implement programs that will impact ASHRAE members**

Tools & Resources for Engaging Policymakers

- **CTTC/Advocacy Primer on Government Activities**
- **Fact Sheet**
- **FAQ**
- **Additional Materials**
 - ✧ www.ashrae.org/advocacy
 - ✧ www.ashrae.org/CTTC
 - ✧ www.ashrae.org/technology
 - ✧ www.ashrae.org/greenstandard

Further Information

- **Information on Standard 189.1:**
www.ashrae.org/greenstandard
- **ASHRAE Training on Standard 189.1**
- **User Manual is in development to assist in the understanding in how to apply the standard**

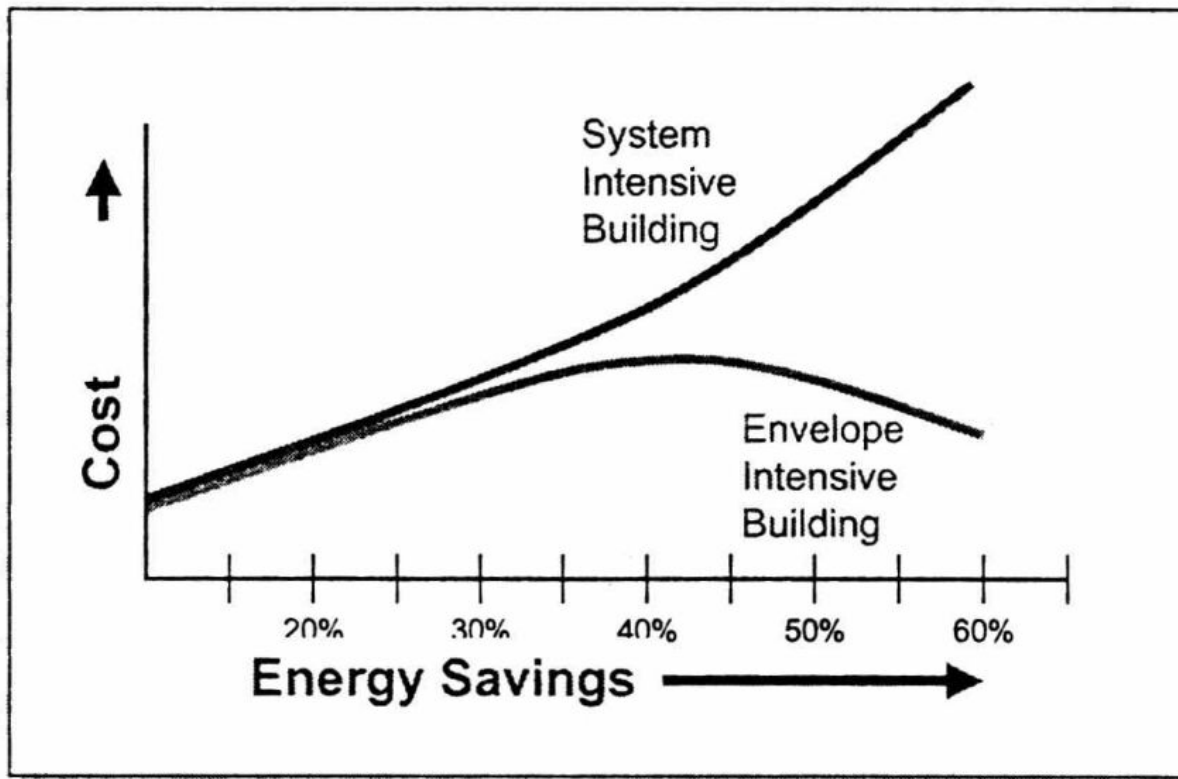
Final Thoughts

The Cost of Going Green

“....there is no significant difference in average cost for green buildings as compared to non-green buildings.”

Report by US Cost Consultant Davis Langdon
Adamson on additional 221 projects (1/3 green).
July 2007

Cost of Energy Optimization



Questions

