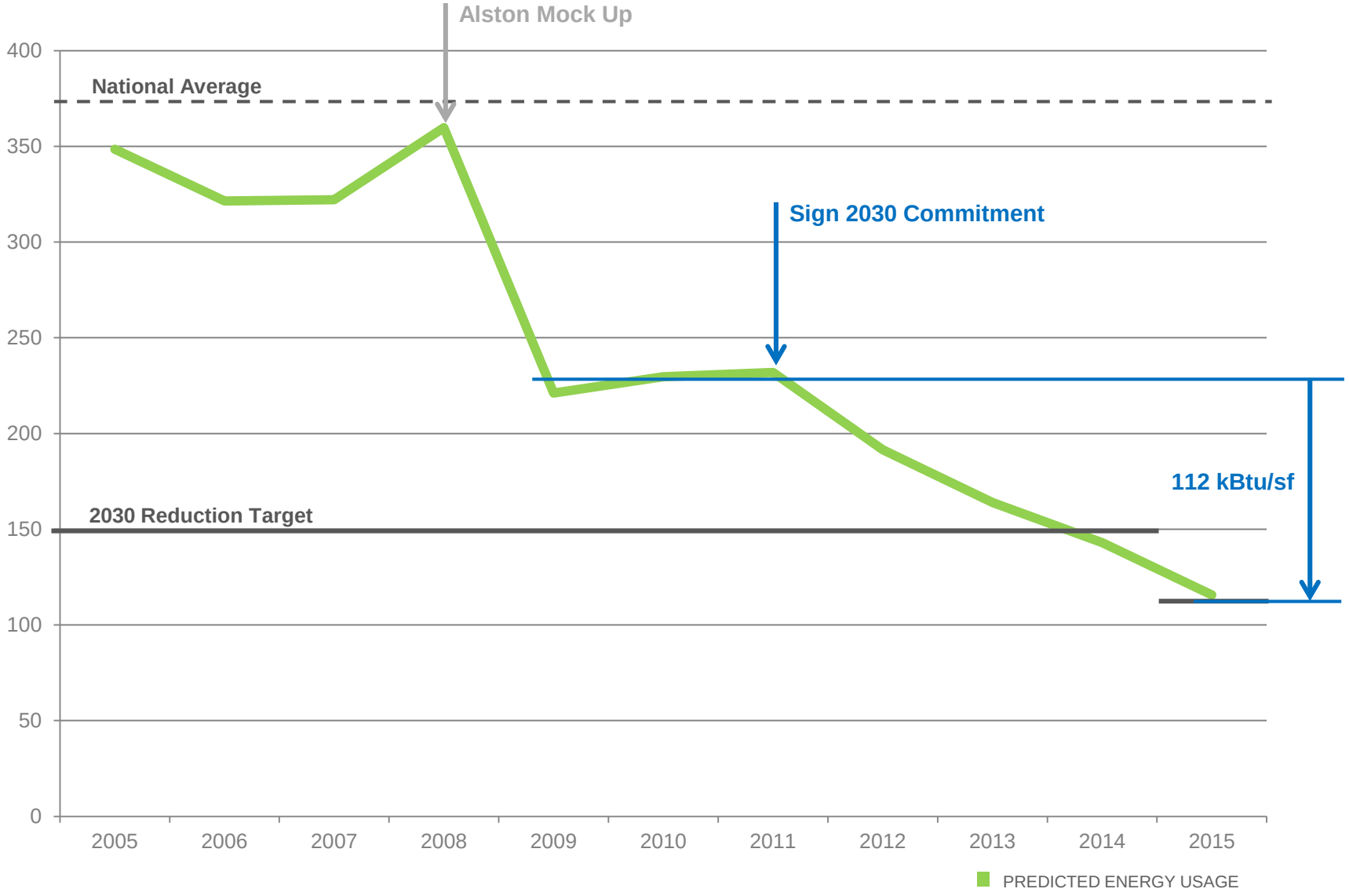
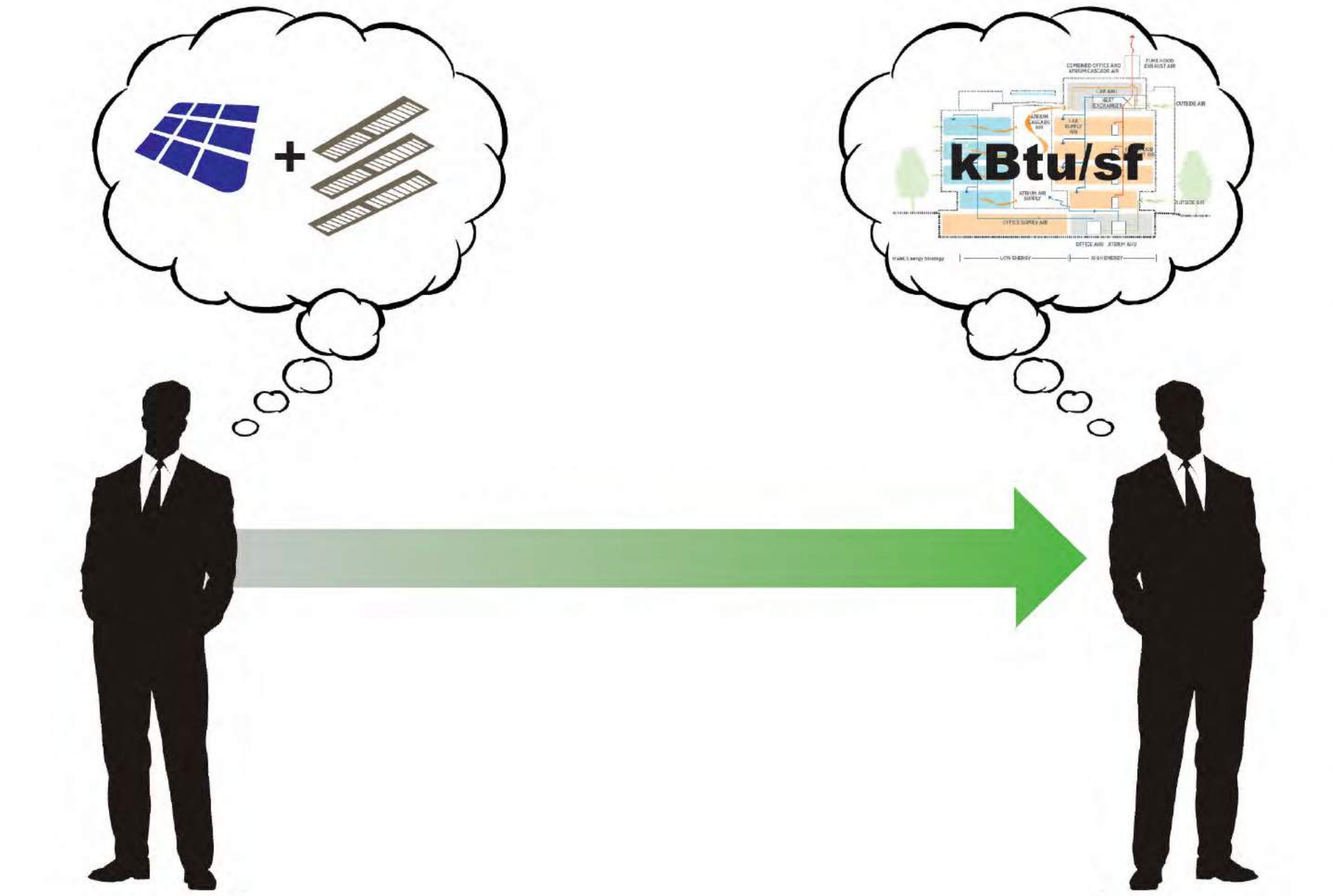
BY MARKET SECTOR - LABS

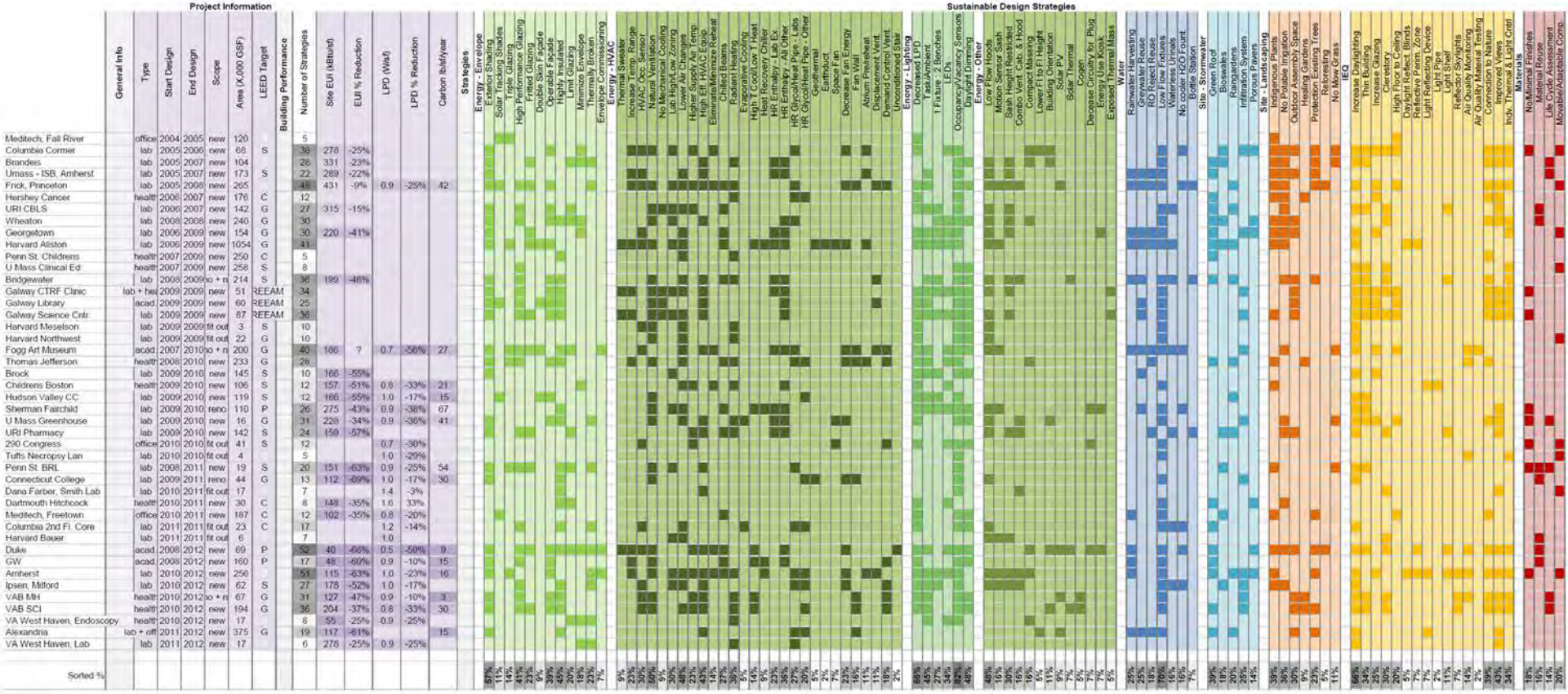


TRANSFORMATION FROM DISCRETE ICONS OF SUSTAINABILITY

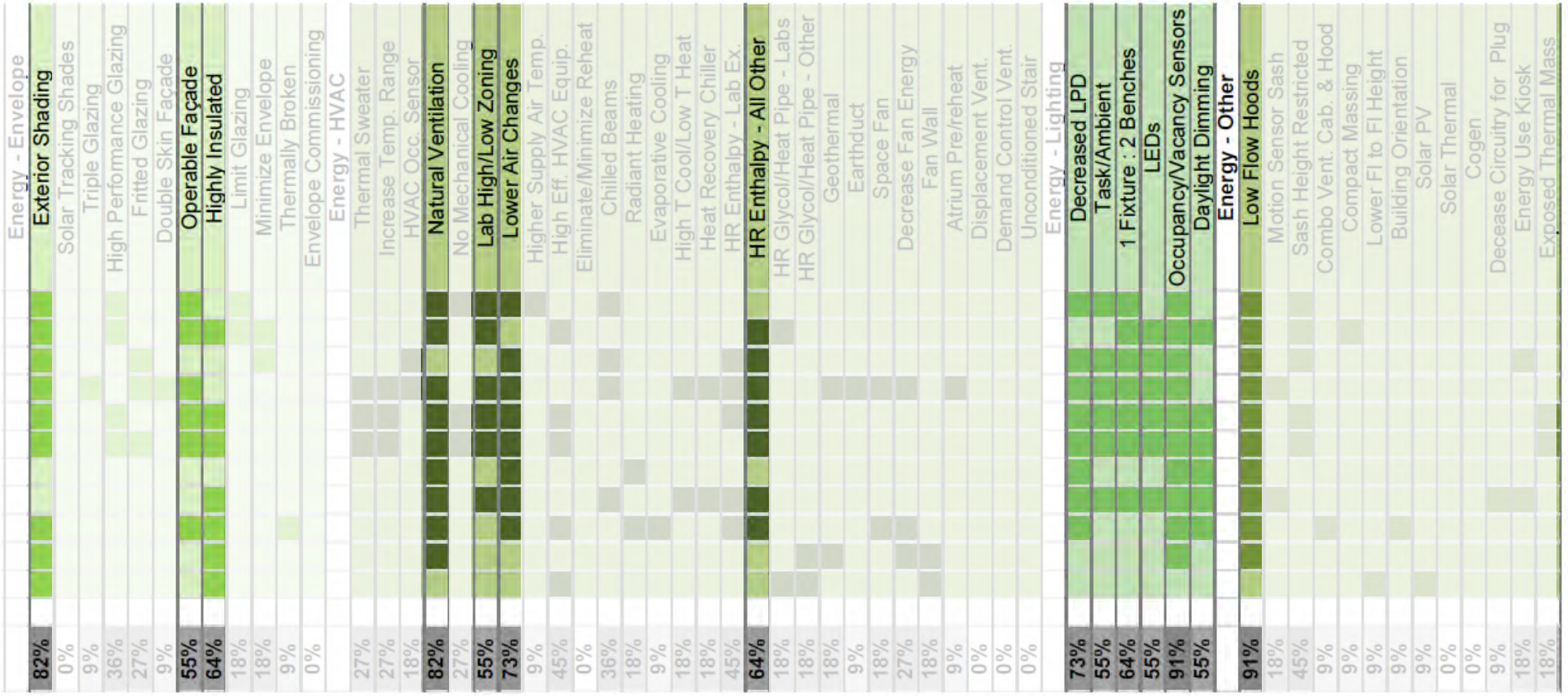
TO AN ENERGY LITERACY ABOUT SYSTEM PERFORMANCE



CONNECTING PERFORMANCE AND DESIGN STRATEGIES



CONNECTING PERFORMANCE AND DESIGN STRATEGIES

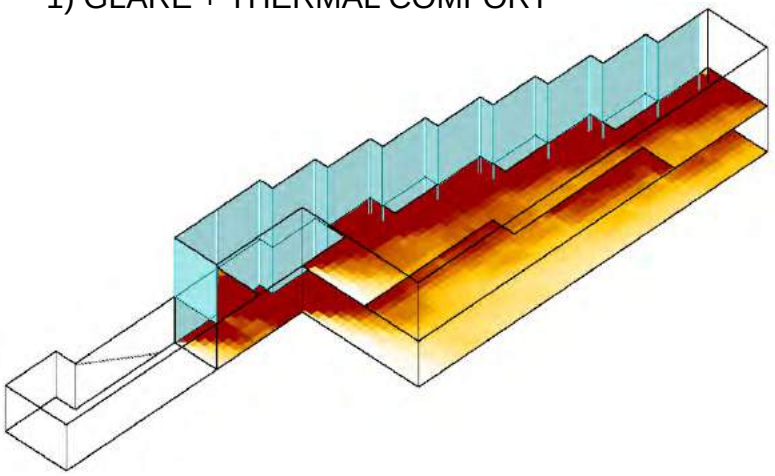


COMMON STRATEGIES FOR LOWEST EUI LABS

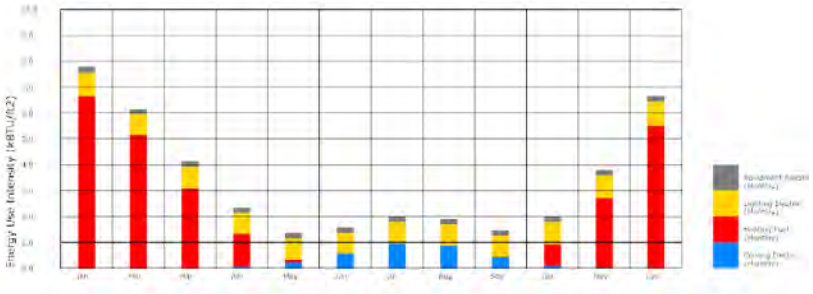
- Sunshading & High Performance Envelope
- Minimize Ventilation Air
- Heat Recovery
- High Performance Lighting
- Natural Ventilation

INTEGRATING EARLY MODELING

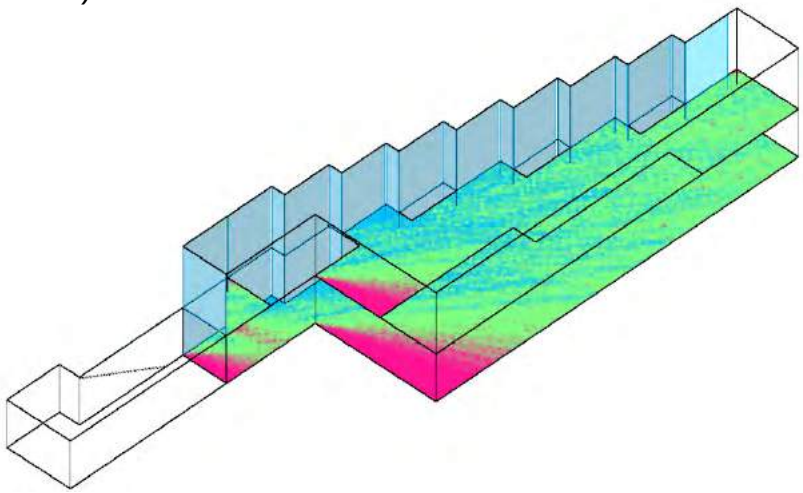
1) GLARE + THERMAL COMFORT



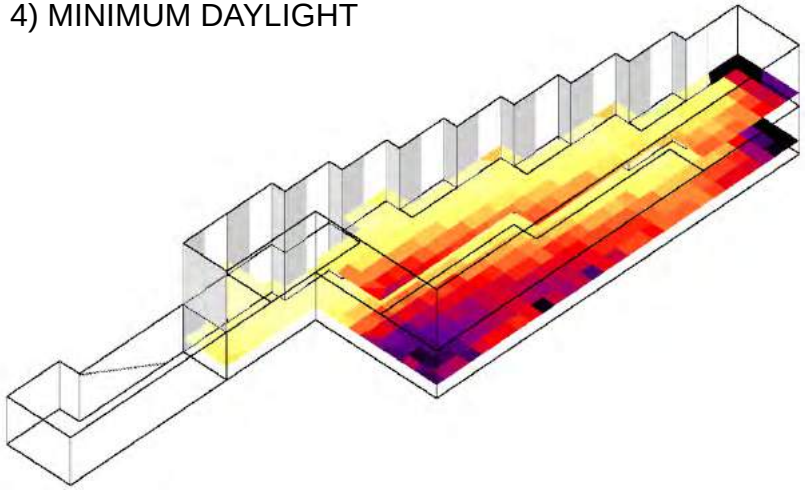
3) PEAK COOLING + THERMAL ENERGY



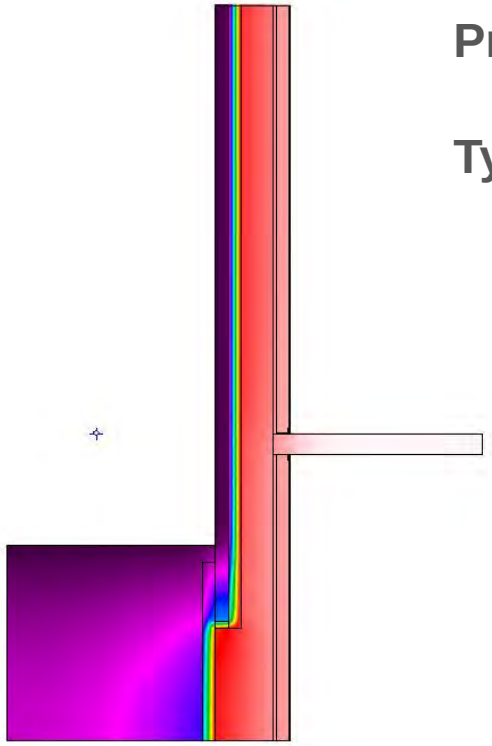
2) VIEWS TO HILLTOP



4) MINIMUM DAYLIGHT

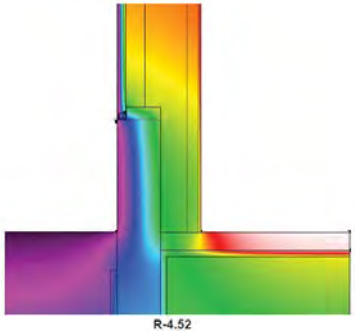


INTEGRATING RESEARCH

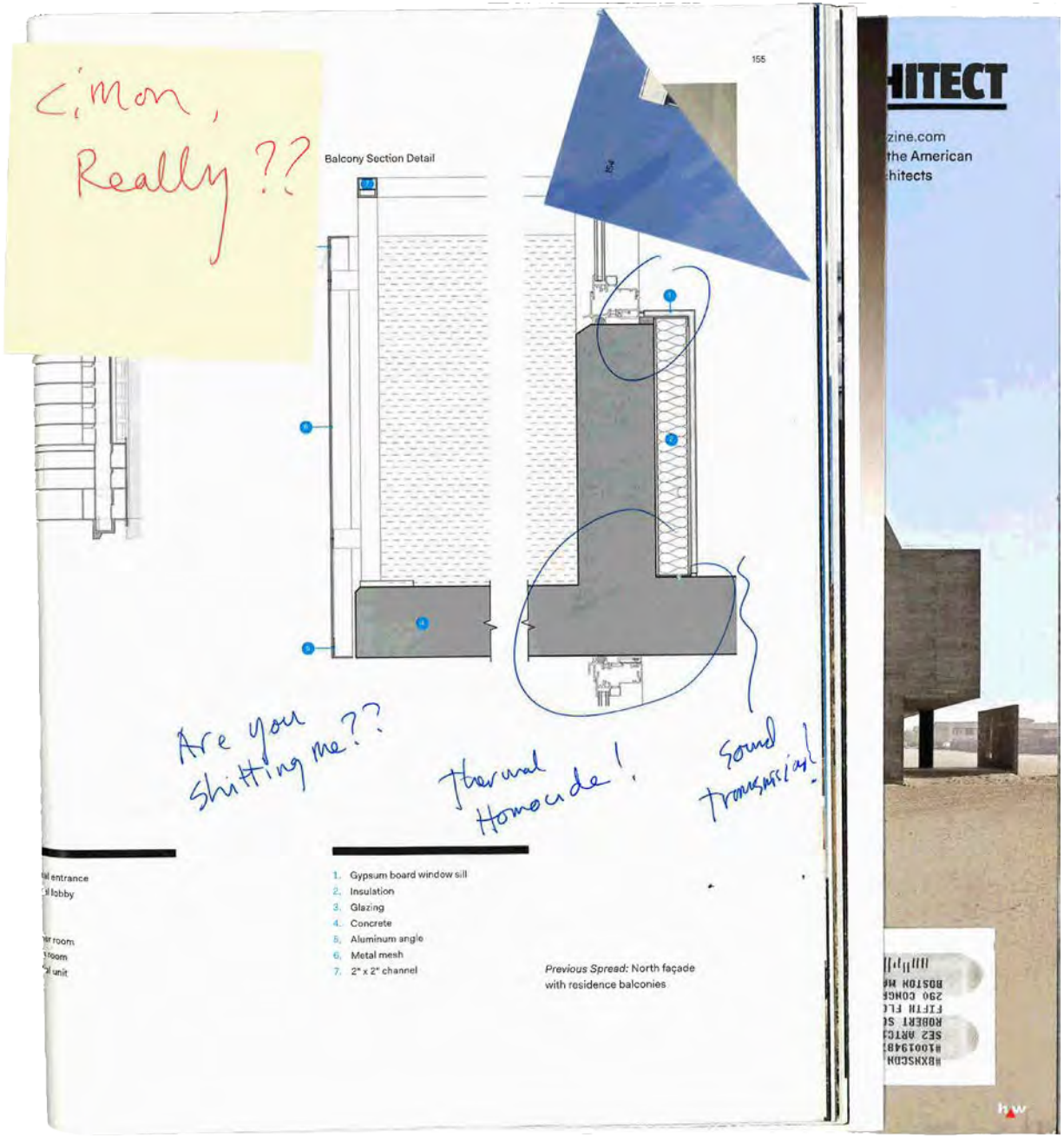


Project Detail R-23.5

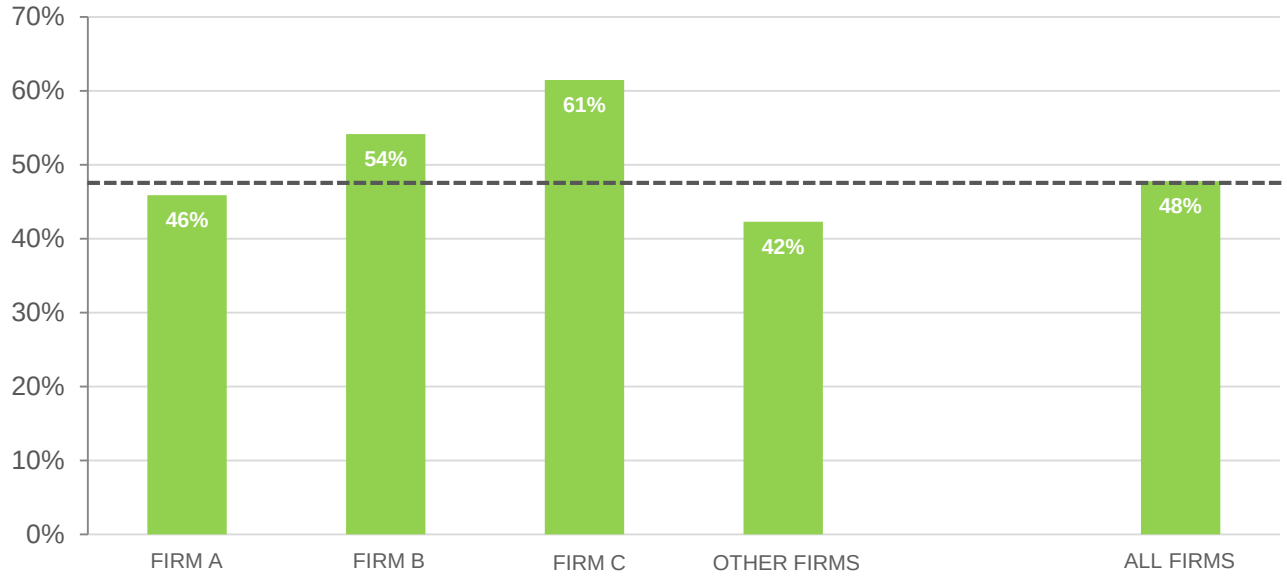
Typical Detail R-4.1

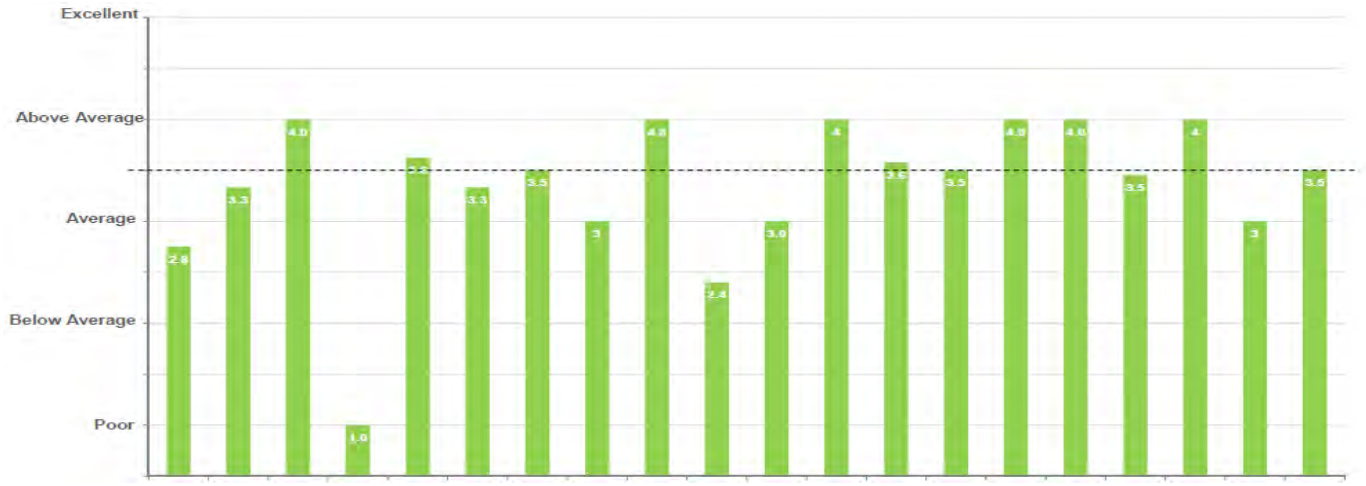


CHANGING MINDS AS WELL AS PROJECTS



CONNECTING PERFORMANCE AND CONSULTANTS





SUSTAINABILITY ACTION PLAN

- Design Principles
  - Reduce Excess Capacity
  - Study Building Operation
  - First Principle Engineering
  - Harnessing Available Resources
  - Adoption of Technological Solutions
- Integrated Design Charrettes
- Energy Benchmarks & Targets
- Basis of Designs
- Shadow Studies
- Site Analysis
- Energy & Performance Modeling
- Life Cycle Cost Analysis
- Embodied Energy
- POEs

PAYETTE SUSTAINABILITY ACTION PLAN

Payette's open studio, in a LEED Platinum Certified building, fosters collaboration.

History

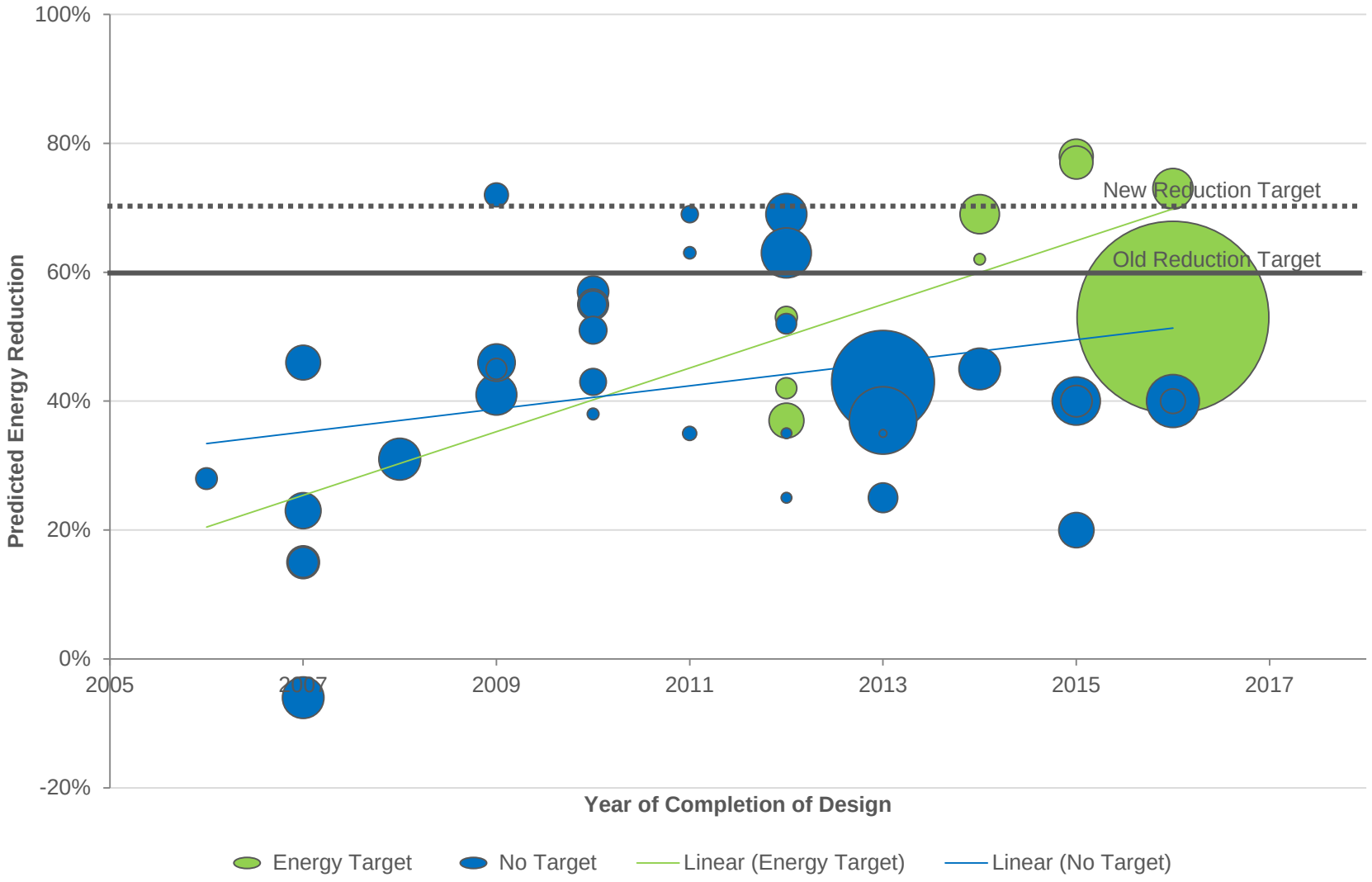
Three generations, many voices, one practice. In 1932, Fred Markus and Paul Nocka started a small design firm in Boston. Using pioneering time-and-motion studies, they helped hospitals throughout New England take apart and retool complex, mission-critical processes including nursing units, kitchens and pharmacies. In 1960, Tom Payette joined the firm, adding a modern design philosophy to the firm's innovative process. Tom led the firm in designing a series of New England hospitals that were centered on the experience of the patient, manifested by an intimate connection to the landscape, abundant use of color and natural light to help orient patients and visitors.

Through the promotion of the same humanistic values and fundamental design approach, the firm broadened its focus in the following decades to include high technology buildings, bringing deep technical expertise, commitment to rigorous research and dedication to beauty to a new class of projects. Today, the practice has advanced as an international leader by providing planning and design services to leading institutions across the country and abroad.

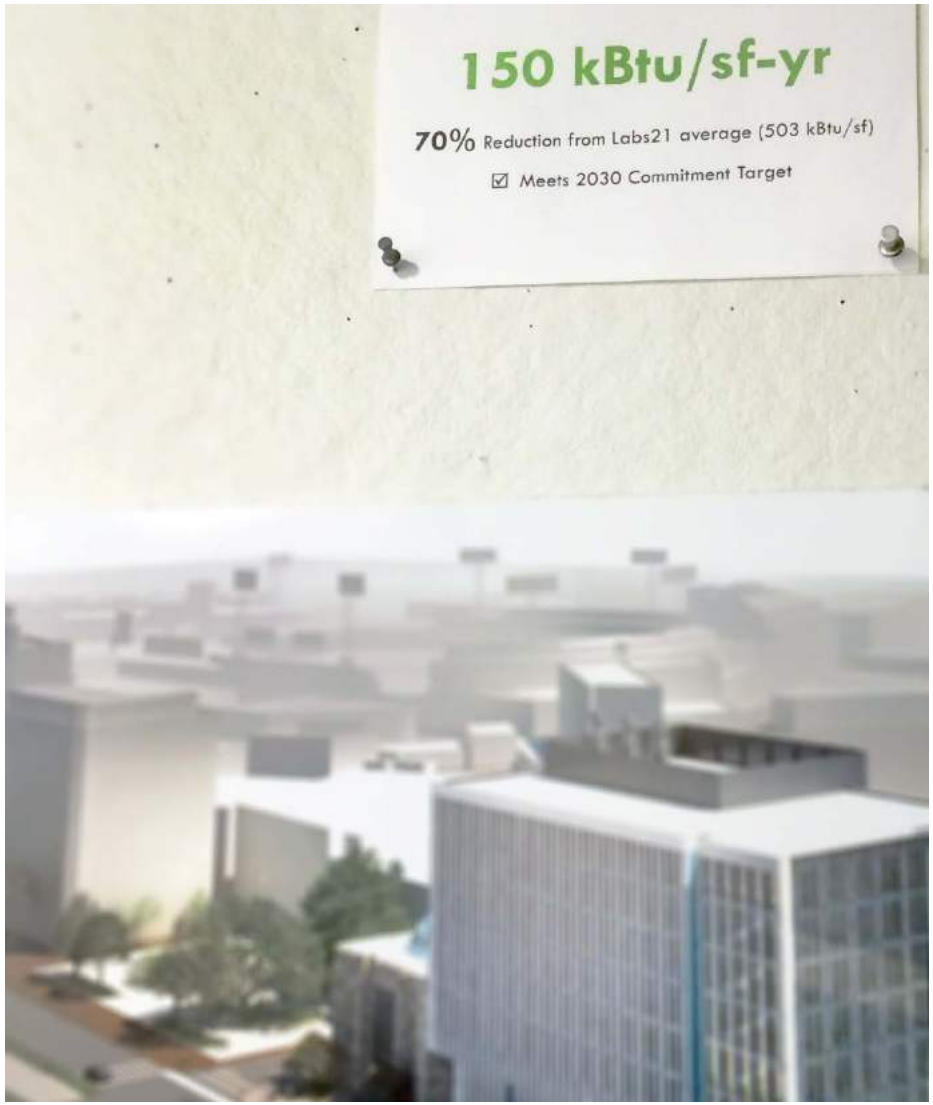
We approach design as a process that combines problem-solving, research and invention. The architecture we practice is inherently multidisciplinary. Our definition of architecture embraces planning, programming, landscape architecture and interior design as being intimately intertwined in producing our work.

PAYETTE

IMPACT OF SETTING ENEGRY TARGET



PERFORMANCE IS PART OF OUR WORKFLOW



PERFORMANCE IS HOW WE TALK ABOUT OUR WORK

Commitment to the Environment

Committing to the future of the environment means rigorously designing our buildings through the lens of sustainability. Building science is the data-driven investigation of building systems, materials, envelope and operational energy usage in order to optimize a building's performance and minimize its environmental impact. As stewards of our clients' resources, and with conviction in our responsibility to lead, we embrace the challenge of delivering the highest-performing buildings for our inherently demanding market sector. Take a look at how our academic science projects perform on average:

64%
average energy savings

42%
average water reduction

91%
average building area with access to daylight

Our practice specializes in technology-rich and energy-intensive buildings, which are typically the highest consumers of energy on an academic campus. These specialized environments are challenging to reduce their energy usage, but because of their substantial environmental impact, the imperative is that much greater. Take a look at the energy use intensity (EUI) in kBtu/SF/YEAR of a sample of our projects and how they stack up against the national average of similar buildings in the same climate zone:

Amherst College, New Science Center
94 kBtu/SF
75% EUI REDUCTION

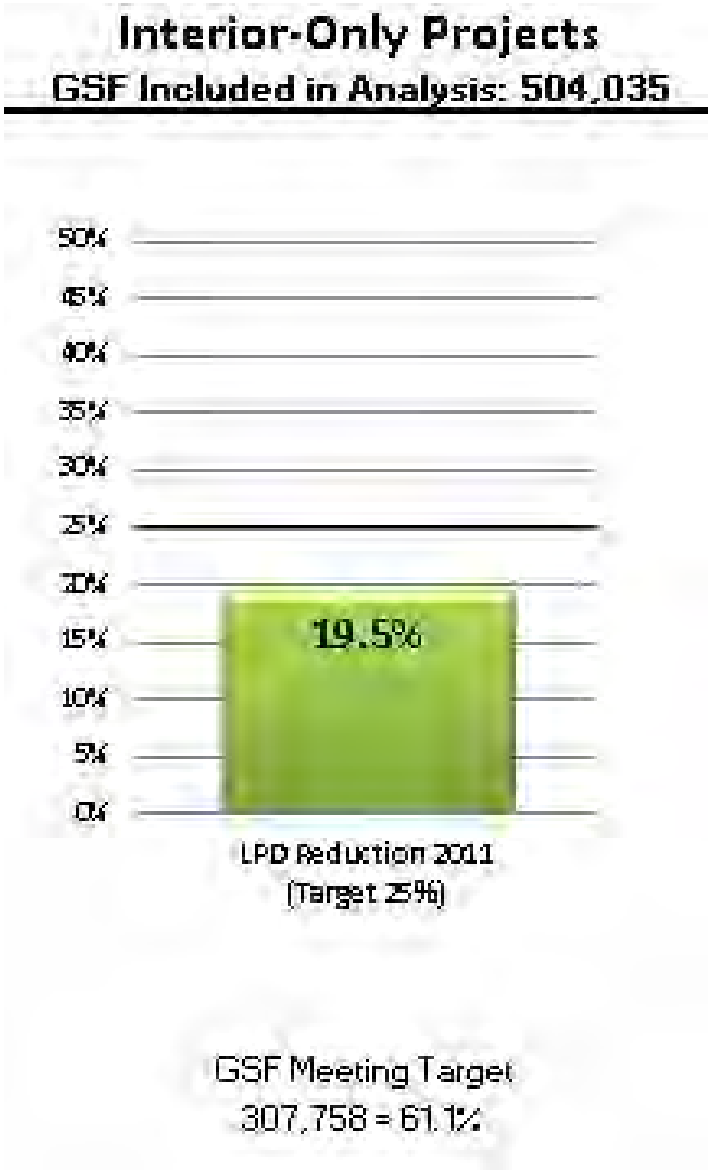
Northeastern University, Interdisciplinary Science and Engineering Complex
103 kBtu/SF
75% EUI REDUCTION

National University of Ireland, Galway: Biosciences Research Building
143 kBtu/SF
71% EUI REDUCTION

HISTORY AT BERGMEYER

- Bergmeyer is a 72-person Boston-based general commercial firm
- Joined AIA 2030 Commitment in June 2011
- First year of reporting was due March 31, 2012
- First Sustainability Action Plan published Fall 2012
- Follow-up Sustainability Report published Summer 2014

SETTING A BASELINE - 2011 REPORTING - INTERIORS



SETTING A BASELINE - 2011 REPORTING FINDINGS

Overall observations/conclusions:

- 49 total projects reported with 38 interior-only projects
- None of the whole building projects and only 9 of the interior-only projects met or exceeded the 2030 targets
- All 3 interior-only workplace projects exceed the 25% LPD reduction target

Office – Boston, MA	0.67	1.0		33.0%
Office – Boston, MA	0.56	1.0		44.0%
Office – Providence, MA	0.67	1.0		33.0%

SETTING A BASELINE - 2011 REPORTING FINDINGS

Overall observations/conclusions:

- Of the 19 total retail projects (all interior-only), the two that met the 25% LPD reduction threshold were located in institutions

University computer store	1.5		27.3%
Museum bookstore	1.5		33.3%

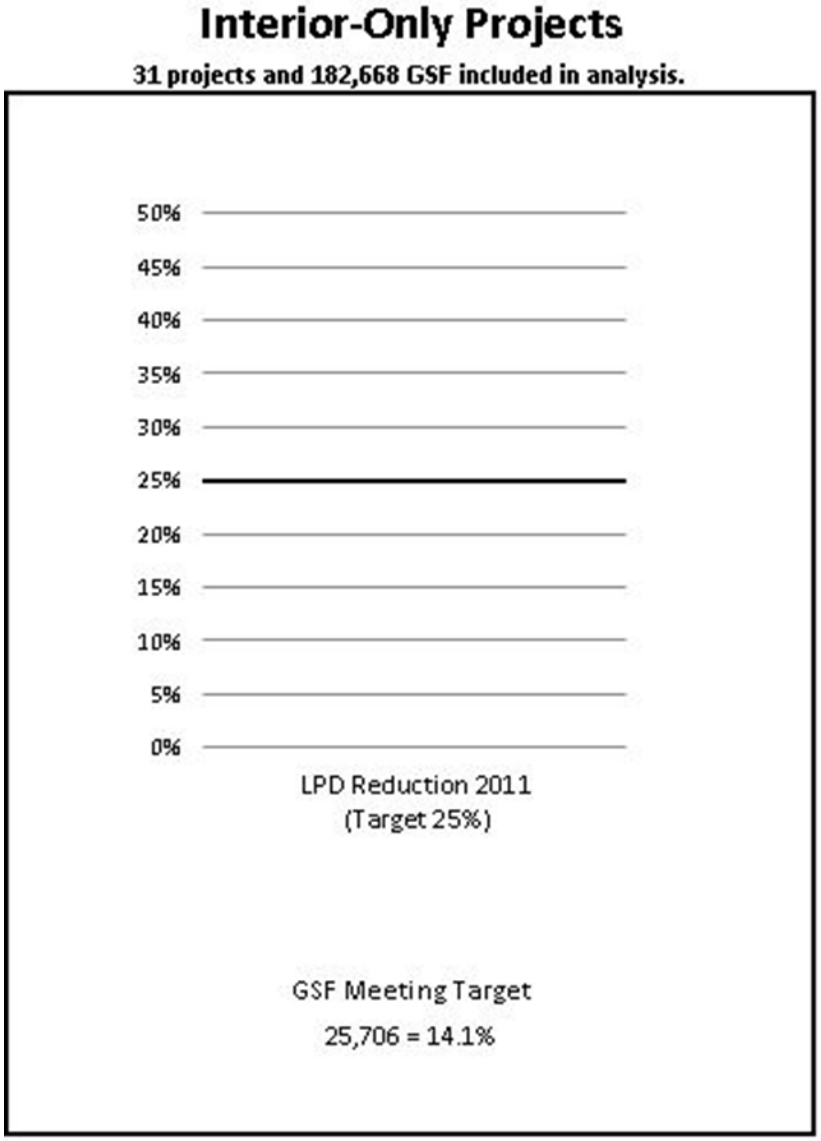
- The best performer was a university dining hall

University dining hall	0.59	1.5		60.9%

2012 - THE BEGINNING OF A QUEST

1.80	1.5		-20.0%
2.60	1.5		-73.3%
0.96	1.5		36.0%
1.28	1.5		14.7%
1.77	1.5		-18.0%
1.50	1.5		0.0%
3.60	1.5		-140.0%
3.90	1.5		-160.0%
3.60	1.5		-140.0%
1.67	1.5		-11.3%
2.14	1.5		-42.7%
2.28	1.5		-52.0%
1.80	1.5		-20.0%
1.09	1.5		27.3%
1.50	1.5		0.0%
1.90	1.5		-26.7%
1.20	1.5		20.0%

2012 - THE BEGINNING OF A QUEST



2012 - THE BEGINNING OF A QUEST

- Compared to Year 1 our LPD was off the chart (actually, it wasn't even on the chart)
- As reported, spaces that had passed COMcheck were far over the allowable code limits

2012 - THE BEGINNING OF A QUEST

The AIA 2030 reporting form doesn't allow for the retail display space allowances that the code does

Additional Interior Lighting Power Allowance =
1000 watts + (Retail Area 1 × 1.0 W/ft^2)
+ (Retail Area 2 × 1.7 W/ft^2)
+ (Retail Area 3 × 2.6 W/ft^2)
+ (Retail Area 4 × 4.2 W/ft^2) ,

Retail Area 1 = the floor area for all products not listed in Retail Areas 2, 3, or 4;

Retail Area 2 = the floor area used for the sale of vehicles, sporting goods, and small electronics;

Retail Area 3 = the floor area used for the sale of furniture, clothing, cosmetics, and artwork; and

Retail Area 4 = the floor area used for the sale of jewelry, crystal, and china.

2012 - THE BEGINNING OF A QUEST

COMcheck Software Version 3.9.1

Interior Lighting and Power Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**
Project Title : SPANX

Construction Site:
8097A TYSONS CORNER CENTER
SPACE J1AU(C)
TYSONS, VA

Owner/Agent:

Designer/Contractor:
Don Penn Consulting Engineer
635 Westport Parkway, Suite 300
Grapevine , TX 76051

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Retail:Sales Area	986	1.7	1676
Allowance: Furniture, clothing, cosmetics highlighting / Fix. ID: FA-58 LED	450(a)	2.6	1170(b)
Allowance: Furniture, clothing, cosmetics highlighting / Fix. ID: FC LED	175(a)	2.6	455(b)
Allowance: Furniture, clothing, cosmetics highlighting / Fix. ID: FE	210(a)	2.6	546(b)
Allowance: Furniture, clothing, cosmetics highlighting / Fix. ID: FF-1	10(a)	2.6	26(b)
Warehouse:Fine Material Storage	185	1.4	259
Common Space Types:Restrooms	58	0.9	52
		Supplemental Allowed Watts(c) =	347
		Total Allowed Watts =	4531

We realized we needed to develop a process and then tell our engineers specifically how to do the calculations – or better yet, do them ourselves

1987 watts vs. 4531 watts

2012 - THE BEGINNING OF A QUEST

AIA 2030 Commitment
Reporting Data Requirements
As of February 25, 2013

Bergmeyer is committed to designing spaces that use substantially less energy, reduce greenhouse gas emissions and provide a healthy and comfortable environment. In 2011, the firm joined the AIA 2030 Commitment, thereby accepting the 2030 Challenge that all new buildings and major renovations Bergmeyer designs will be carbon neutral by 2030 and will not use fossil-fuel, greenhouse gas-emitting energy to operate. In order to reach this goal – and the interim reduction targets – a collaborative effort between architects and engineers is critical.

Currently, our projects must be designed to achieve a 60% reduction in site Predicted Energy Use Intensity (PEUI) as compared to either the 2003 Commercial Buildings Energy Consumption Survey (CBECS) or preferably, a regional average site PEUI obtained from ENERGY STAR Target Finder. For interior-only projects, a minimum 25% reduction in Lighting Power Density (LPD) from ASHRAE 90.1-2007 is targeted.

Bergmeyer collects this data annually on every project in design and reports it to the AIA for compilation into a national report.

As part of our reporting, our engineering partners are required to provide us with the following information (if applicable) at the end of both the schematic and document production phases of the project:

- PEUI in kBtu/sq. ft./yr. (for projects that perform energy modeling)
- Design energy code (for whole building or major renovation projects that don't perform energy modeling)
- LPD in W/sq. ft.(for interior-only projects)

We look forward to working with you to achieve our 2030 Commitment goals on this project.

2013 AIA 2030 COMMITMENT RESULTS

- Only 8 of 30 retail projects met or exceeded the 25% reduction target
- Once again, commercial and institutional projects were able to get us over the 25% threshold