

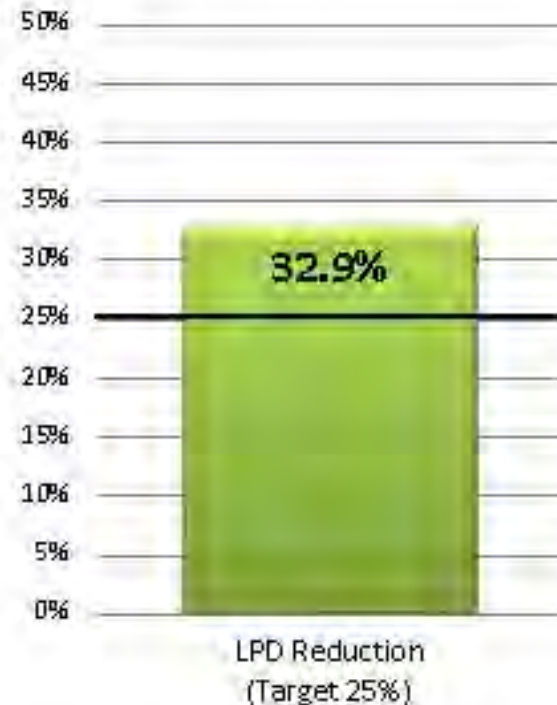
# 2014 AIA 2030 COMMITMENT RESULTS



- Only 4 of 16 retail projects met or exceeded the 25% reduction threshold
- 12 of 16 food service-type projects exceeded the target, with 4 hitting more than a 55% reduction
- 1 office project exceeded the target reduction

## Interior-Only Projects

**41 projects and 201,608 GSF included in analysis.**



GSF Meeting Target  
125,945 = 62.5%

FAST FORWARD TO 2015

# Lighting Power Density – (LPD): What It Is, Why It Matters and How It's Calculated

May 19, 2015

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Bergmeyer

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AND THEN TO 2016

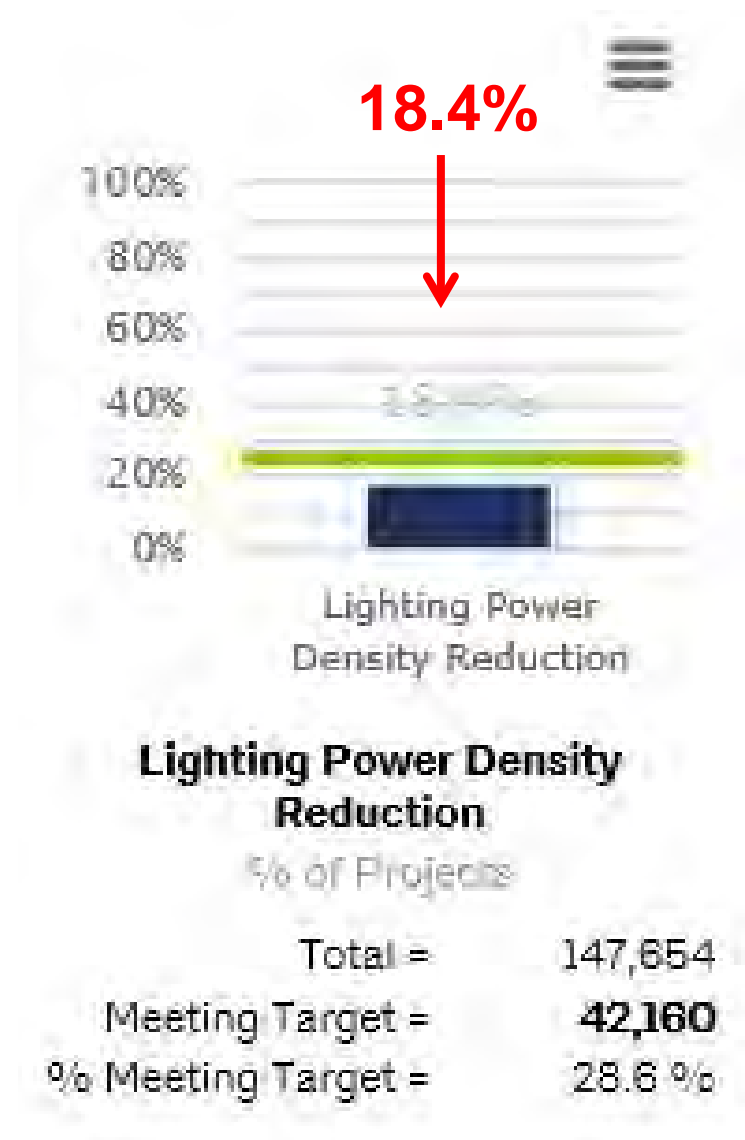


## Using the DDx for AIA 2030 Reporting: A How-to Guide

February 2016



# 2015 AIA 2030 COMMITMENT RESULTS – WHAT HAPPENED???



# 2015 AIA 2030 COMMITMENT RESULTS – WHAT HAPPENED???

- Only 17 of 48 interiors projects met the 25% reduction threshold
- 6 of 27 retail projects met the 25% reduction threshold
- All 4 food service-type projects exceeded the target
- 1 office project and 1 dormitory project exceeded the target



# A POSSIBLE SOLUTION?

Bergmeyer

## USING REVIT TO CALCULATE LPD

TO CREATE MORE EFFICIENTLY LIT SPACES  
IN ORDER TO MEET THE AIA 2030 COMMITMENT TARGET

July 2016

## A POSSIBLE SOLUTION?

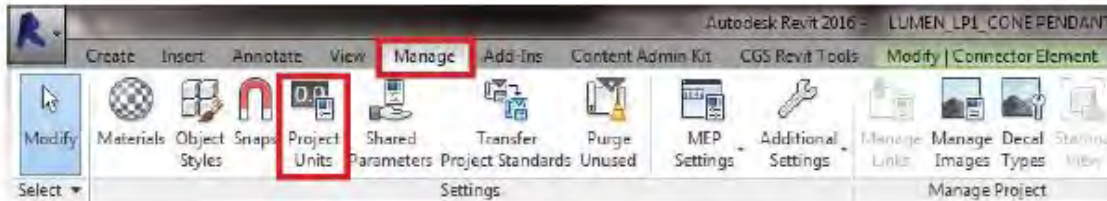
1. Setup “spaces” to define areas for LPD calculations
2. Utilize schedules to calculate LPD
3. Adjust parameters in light fixtures to calculate LPD
4. Alter lighting layouts to be more energy efficient
5. Meet and exceed the 2030 target reduction!



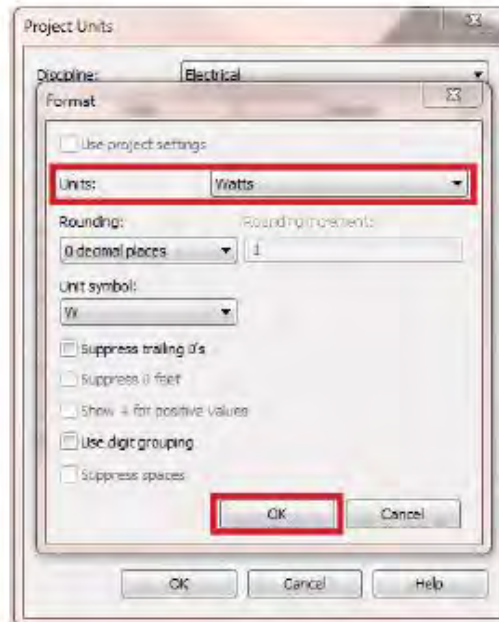
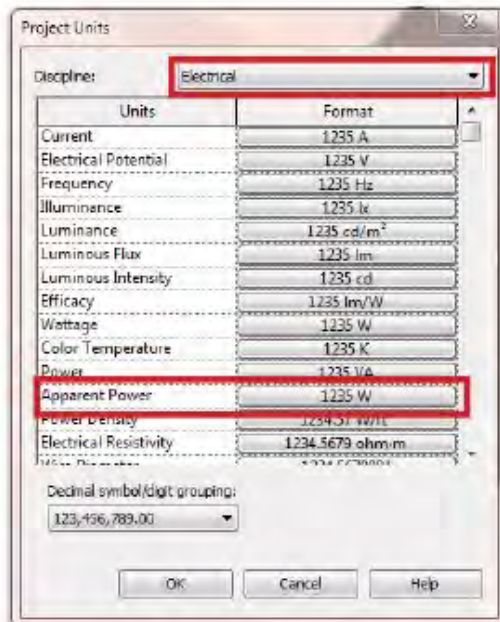
# A POSSIBLE SOLUTION?

## ELECTRICAL PARAMETER SETTINGS

You will need to do this for EVERY LIGHT FIXTURE in the project.



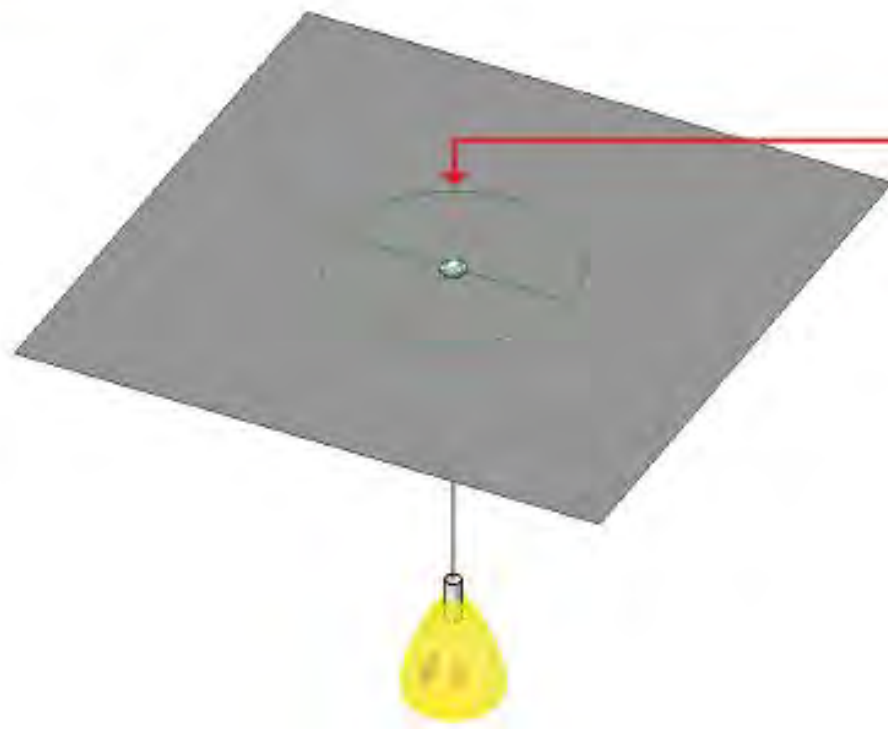
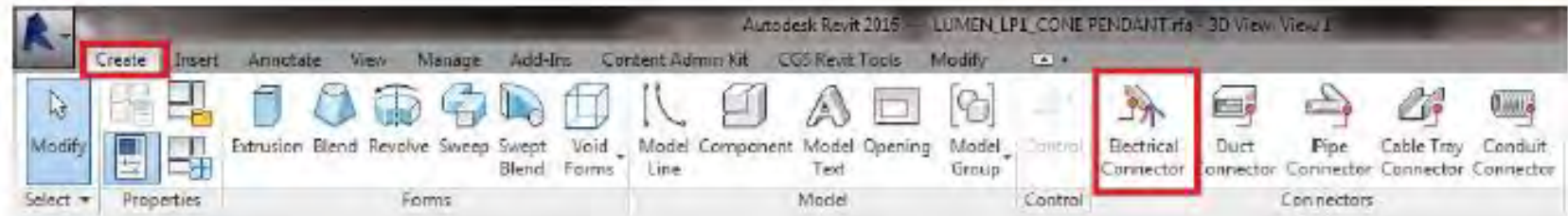
- Edit the Light Fixture Family
- Change the Project Units.



- Change the Discipline to "Electrical"
- Change the units for Apparent Power.
- Change the Units to "Watts".
- Click "OK".



# A POSSIBLE SOLUTION?



- Add the Electrical Connector.
- The default placement is face based. Place the green symbol on the face that hosts your fixture (ceiling, wall, etc.).
- Shorten any reference planes that extend far beyond the light fixture.

# A POSSIBLE SOLUTION?

## CALCULATING THE LPD

### Case Study #1

<LPD>						
A	B	C	D	E	F	G
NO	ROOM	AREA	Unbounded Height	Actual Lighting Load	LPD	Level
101	SALES	1702 SF	24' - 10"	4422 W	2.60 W/ft <sup>2</sup>	FIRST FLOOR
102	EXAM 1	157 SF	24' - 10"	90 W	0.57 W/ft <sup>2</sup>	FIRST FLOOR
103	PRE-EXAM	196 SF	24' - 10"	120 W	0.61 W/ft <sup>2</sup>	FIRST FLOOR
104	EXAM 2	157 SF	24' - 10"	90 W	0.57 W/ft <sup>2</sup>	FIRST FLOOR
105	UTILITY	55 SF	24' - 10"	33 W	0.60 W/ft <sup>2</sup>	FIRST FLOOR
106	MEN'S RESTROOM	48 SF	24' - 10"	33 W	0.69 W/ft <sup>2</sup>	FIRST FLOOR
107	WOMEN'S RESTROOM	48 SF	24' - 10"	33 W	0.69 W/ft <sup>2</sup>	FIRST FLOOR
108	STOCK	152 SF	24' - 10"	99 W	0.65 W/ft <sup>2</sup>	FIRST FLOOR
109	BREAKROOM	302 SF	24' - 10"	249 W	0.83 W/ft <sup>2</sup>	FIRST FLOOR
111	CORRIDOR	185 SF	24' - 10"	48 W	0.26 W/ft <sup>2</sup>	FIRST FLOOR
Grand total: 10		3000 SF		5217 W		

Target LPD = 1.125

Allowed Wattage =  $1.125 \times 3000 \text{sf} = 3375 \text{W}$

Additional Allowed LPD = 1.0

Additional Allowance =  $1.0 \times 1702 \text{sf} = 1702 \text{W}$

Total Allowed Wattage = **5077W**

5217W > 5077W  
Proposed Watts > Allowed Watts

# A POSSIBLE SOLUTION?

Case Study #1

$$5217W > 5077W$$

Proposed  
Watts

Allowed  
Watts



$$1.15W/sf > 1.125W/sf$$

Proposed  
LPD

Target  
LPD



Missed  
Target



# ZED

ZeroEnergy  
DESIGN



# ABOUT ZED



7



3



97



10



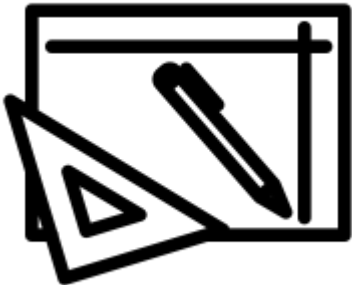
10



50%



# PROJECT MAKEUP



Single Family

80%

Multifamily

20%



Single Family

70%

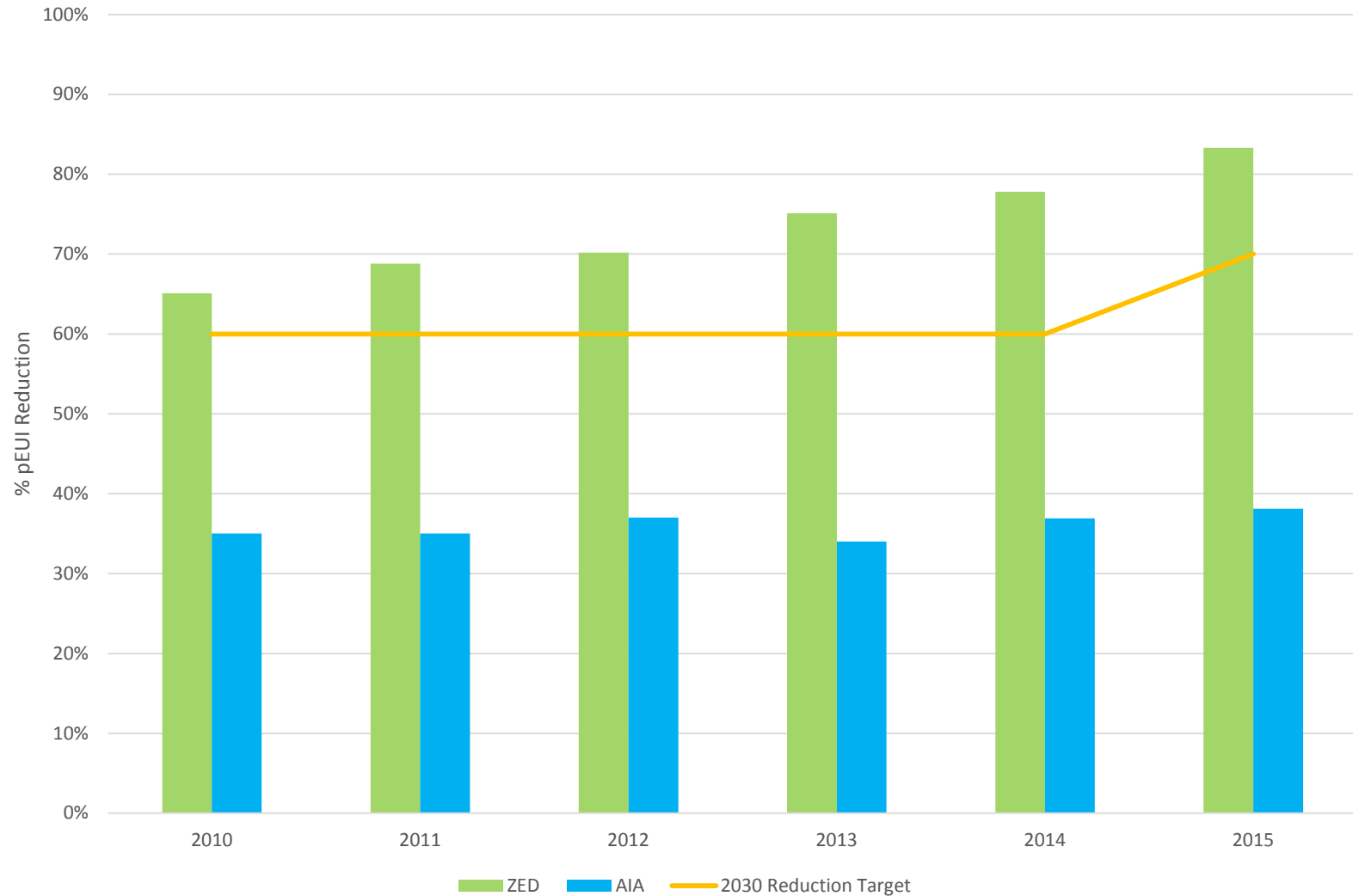
Multifamily

10%

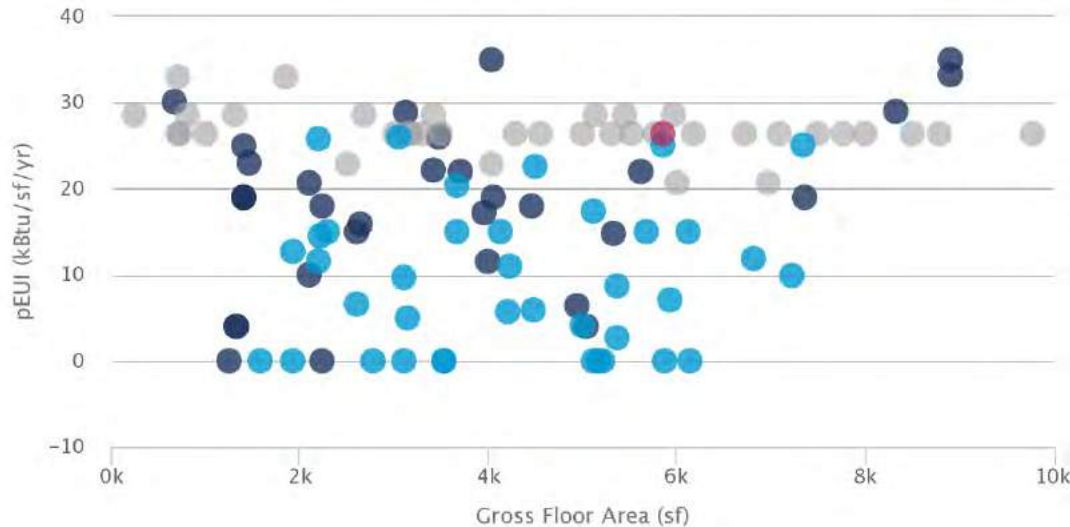
Mixed Use

20%

# 2030 PROGRESS



# COMPARABLE PROJECTS



## Data Filters


Reporting Year: all  
 Gross Floor Area: 0-10,000 sf  
 Use Type: Single Family – Detached  
 Climate Zones: 4, 5 & 6

- 2030 Portfolio - Modeled
- 2030 Portfolio - Not Modeled
- Firm Portfolio - Modeled
- Firm Portfolio - Not Modeled

### Current Data Set Summary

	Gross Floor Area Weighted pEUI (kBtu/sf/yr)	% pEUI Reduction (%)	Gross Floor Area (sf)	No. of Projects
COMBINED	18.89	58.8	447.65 K	108
● 2030 - Modeled	20.66	55.1	114.13 K	32
● 2030 - Not Modeled	26.25	40.3	166.37 K	37
● Firm - Modeled	9.79	81.2	161.3 K	38
● Firm - Not Modeled	26.4	40.0	5.85 K	1

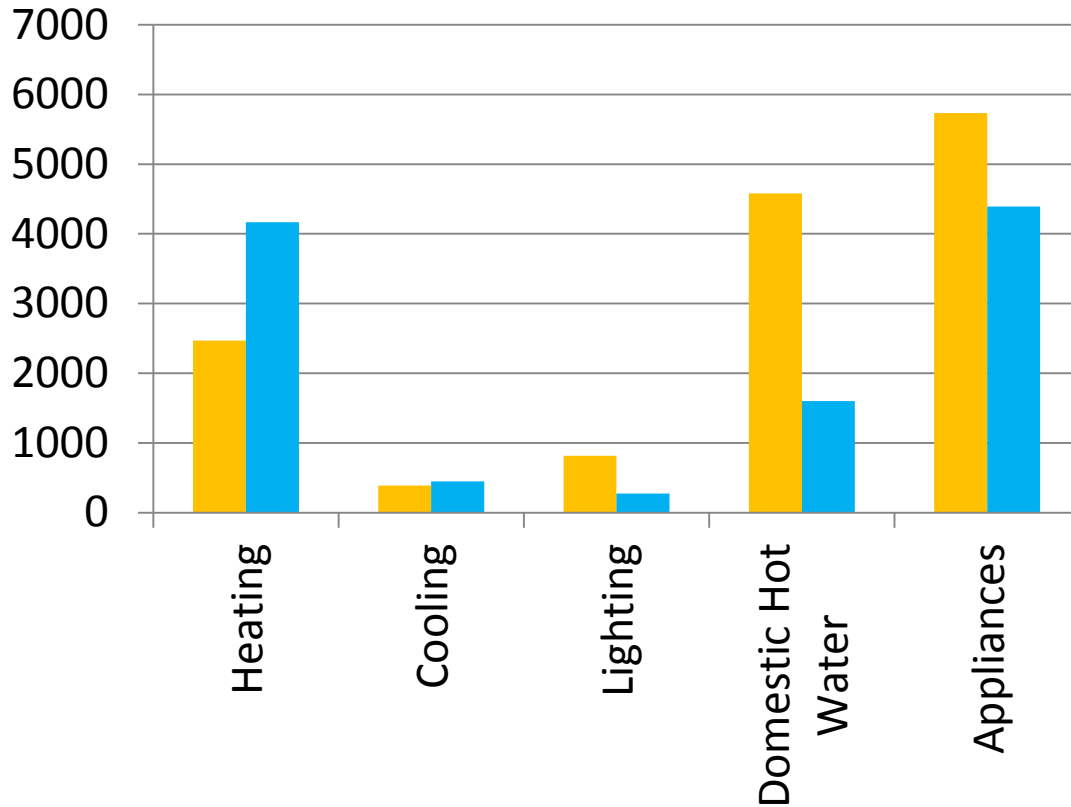
# IN HOUSE

- In house energy model: Passive House Planning Package (PHPP), occasionally RemRate
- 1 modeler 
- 4/6 design professionals = CPHC = understand PHPP
- 100% projects modeled in 2015



# MONITORING

Predicted vs. Actual Usage (kWh/yr)



■ Predicted Use

■ Actual Use





# A CONVERSATION

## PORTFOLIO | ARCHITECTURE



**WELLFLEET MODERN HOUSE**  
Vacation Residence | 13.8kBtu/sf/yr



**TRURO MODERN BEACH HOUSE**  
Multi-Generational Vacation | 11.2kBtu/sf/yr



**LEXINGTON MODERN RESIDENCE**  
Primary Residence | 10kBtu/sf/yr



**PARKER POSITIVE MULTI-UNIT**  
8 Units in 3 Multi-Family Bldgs | 0kBtu/sf/yr



**PASSIVE HOUSE RETREAT**  
LEED Gold Residence | 9.8kBtu/sf/yr



**HILLSIDE CONTEMPORARY RESIDENCE**  
Single Family Primary Residence



**BROOKLINE MODERN RESIDENCE**  
Multi-Generation Residence | 23kBtu/sf/yr



**WELLESLEY GREEN HOME**  
LEED Platinum Residence | 5.7kBtu/sf/yr



**ORLEANS MODERN GREEN HOME**  
LEED Gold Residence | 13.7kBtu/sf/yr



**FARMSTEAD PASSIVE HOUSE**  
Certified Passive House | 4.5kBtu/sf/yr



**CONCORD GREEN HOME**  
Single Family Residence | 15.6kBtu/sf/yr



**POWISSET NET POSITIVE BARN**  
Net Positive Building | 0kBtu/sf/yr



**LINCOLN NET POSITIVE FARMHOUSE**  
Net Positive Energy | 6.3kBtu/sf/yr



**BOSTON FAMILY LOFT**  
Condominium Primary Residence



**MARGATE RESILIENT RESIDENCE**  
Single Family Residence | 9.3kBtu/sf/yr



**NEEDHAM DEEP ENERGY RETROFIT**  
Primary Residence DER | 0.8kBtu/sf/yr



**RYE BARN RENOVATION**  
Barn Residence Deep Energy Retrofit



**JAMAICA PLAIN GREEN LOFTS**  
3 Unit Super-Insulated Multi-Family



# A CONVERSATION



HOME PORTFOLIO SERVICES FIRM BLOG CONTACT

## PORTFOLIO | ARCHITECTURE



13.8

WELLFLEET MODERN HOUSE  
Vacation Residence | 13.8kBtu/sf/yr



11.2

TRURO MODERN BEACH HOUSE  
Multi-Generational Vacation | 11.2kBtu/sf/yr



10.0

LEXINGTON MODERN RESIDENCE  
Primary Residence | 10kBtu/sf/yr



0.0

PARKER POSITIVE MULTI-UNIT  
8 Units in 3 Multi-Family Bldgs | 0kBtu/sf/yr



9.8

PASSIVE HOUSE RETREAT  
LEED Gold Residence | 9.8kBtu/sf/yr



HILLSIDE CONTEMPORARY RESIDENCE  
Single Family Primary Residence



23.0

BROOKLINE MODERN RESIDENCE  
Multi-Generation Residence | 23kBtu/sf/yr



5.7

WELLESLEY GREEN HOME  
LEED Platinum Residence | 5.7kBtu/sf/yr



13.7

ORLEANS MODERN GREEN HOME  
LEED Gold Residence | 13.7kBtu/sf/yr



4.5

FARMSTEAD PASSIVE HOUSE  
Certified Passive House | 4.5kBtu/sf/yr



15.6

CONCORD GREEN HOME  
Single Family Residence | 15.6kBtu/sf/yr



0.0

POWISSET NET POSITIVE BARN  
Net Positive Building | 0kBtu/sf/yr



-6.3

LINCOLN NET POSITIVE FARMHOUSE  
Net Positive Energy | -6.3kBtu/sf/yr



BOSTON FAMILY LOFT  
Condominium Primary Residence



9.3

MARGATE RESILIENT RESIDENCE  
Single Family Residence | 9.3kBtu/sf/yr



0.8

NEEDHAM DEEP ENERGY RETROFIT  
Primary Residence DER | 0.8kBtu/sf/yr



RYE BARN RENOVATION  
Barn Residence Deep Energy Retrofit



JAMAICA PLAIN GREEN LOFTS  
3 Unit Super-Insulated Multi-Family

# DISCUSSION





## CONTACT US:

Andrea Love, Director of Building Science, Payette – [alove@payette.com](mailto:alove@payette.com)

Dee Spiro, Director of Sustainability, Bergmeyer – [dspiro@bergmeyer.com](mailto:dspiro@bergmeyer.com)

Stephanie Horowitz, Managing Director, ZeroEnergy Design – [sh@zeroenergy.com](mailto:sh@zeroenergy.com)