

# Metered Energy Efficiency



**Deep Retrofits Without  
Incentives or Death Spirals:  
Exploring the  
Metered Energy Efficiency Transaction Structure  
(MEETS)**

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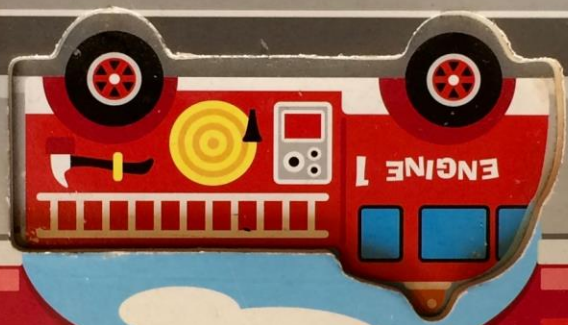
~crafted by hand~

Melissa & Doug



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# Deep EE is the Puzzle Piece

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1. The traditional EE structure is the puzzle
2. It was not designed for...  
and is not aligned with...  
the deep EE “piece”

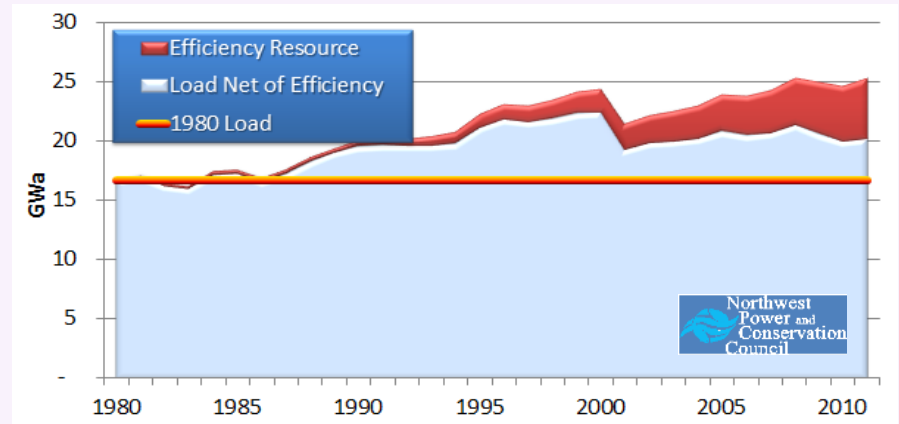
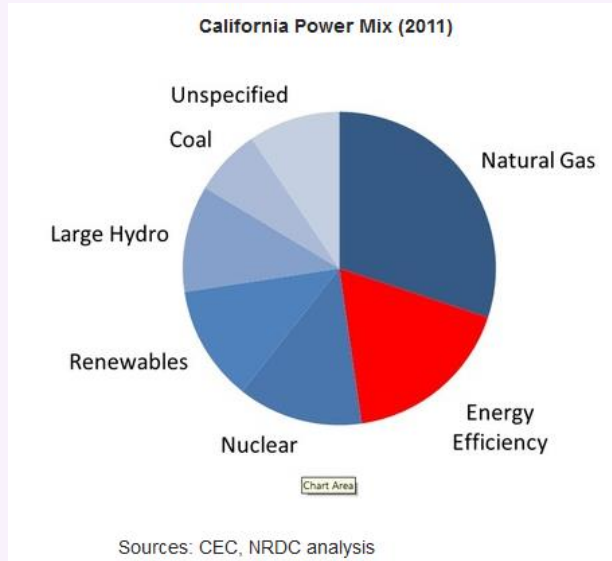
# Result: Deep EE is Not (currently) Scaleable

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1. Undermines utility business model
2. Split incentives destroy the economics

# Problem: Utility Economics

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Energy efficiency currently represents utility **red ink**  
Utilities earn on *investments* like generation

Traditional EE = Negative sales  
= Lost revenue  
= Lost investment

# Problem: Utility Economics (credit)

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Edison Electric  
Institute

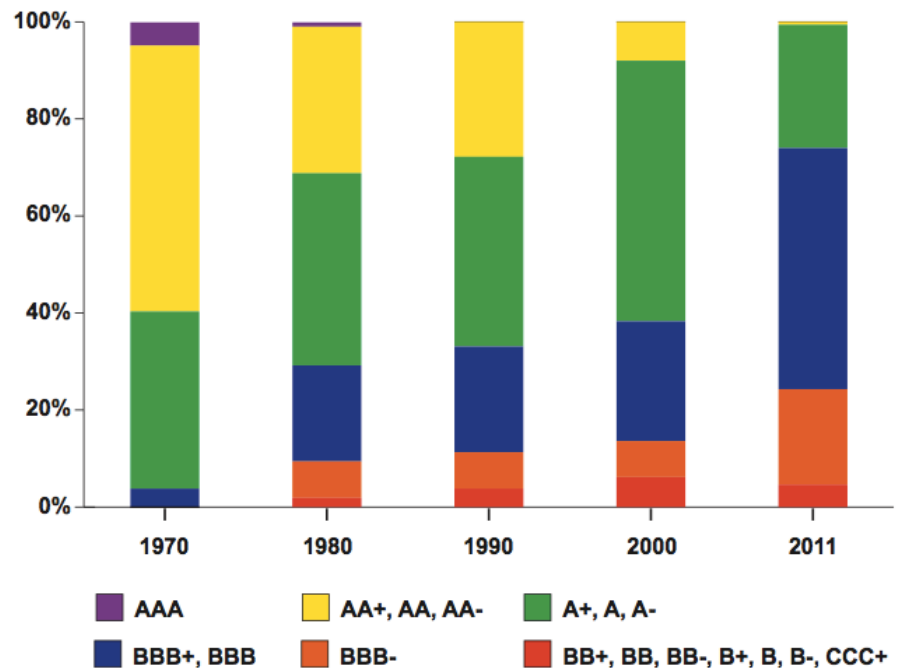
Power by Association™

Energy Efficiency and  
Distributed Generation

*“Could have a major impact  
on realized equity returns  
required investor returns &  
credit quality”*

**Exhibit 2**  
**Electric utility industry credit ratings distribution evolution**

(S&P Credit Ratings Distribution, U.S. Shareholder-Owned Electric Utilities)



Source: Standard & Poor's, Macquarie Capital



# Utility Economics: Result

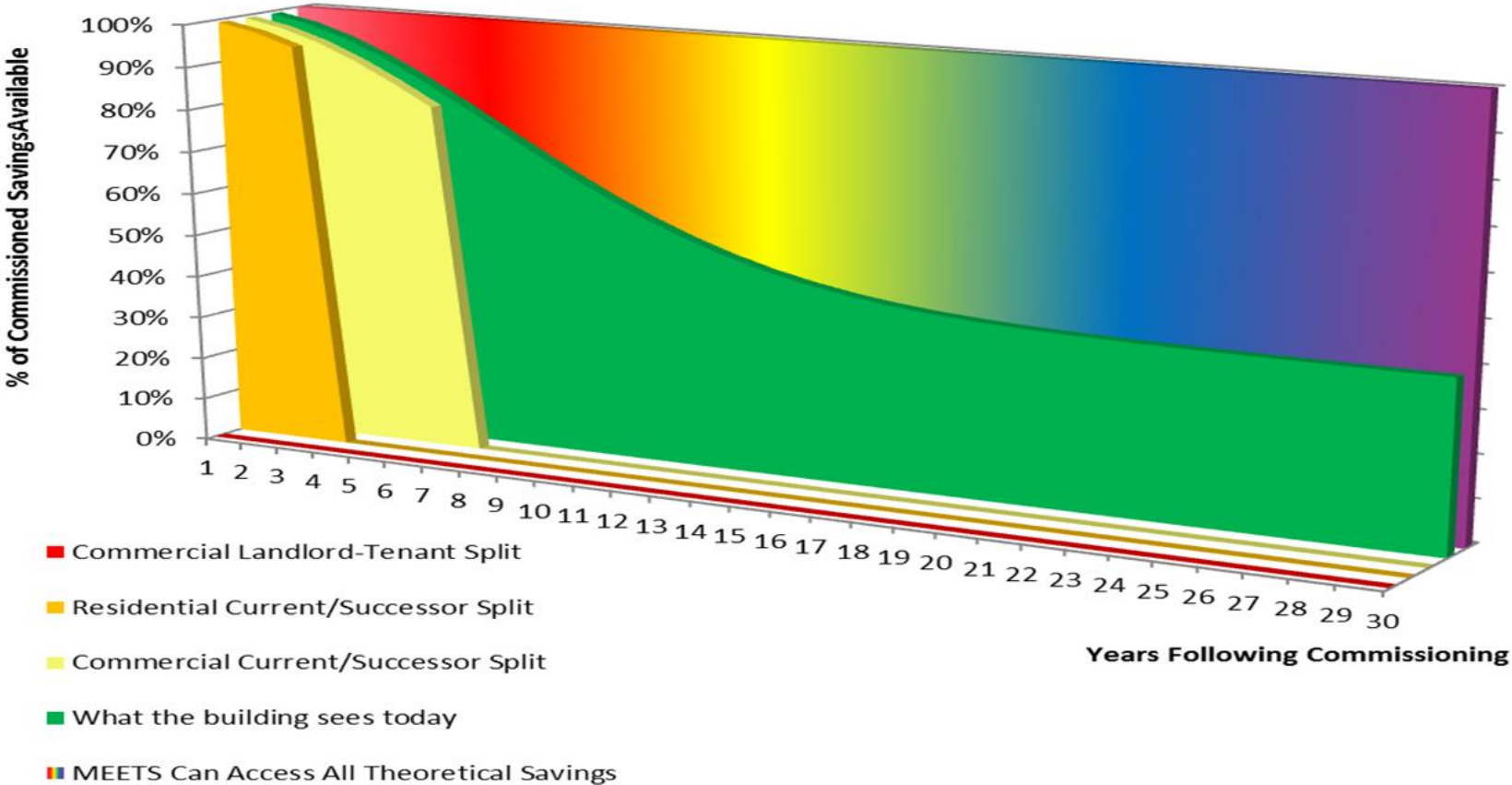
9

1. Utilities resist EE (and particularly deep EE)
2. Can't allow it to scale without changes to EE policy

# Problem: Traditional EE Is All Split Incentives



## Savings Available to MEETS Financing



# Solution: Make EE = Generation

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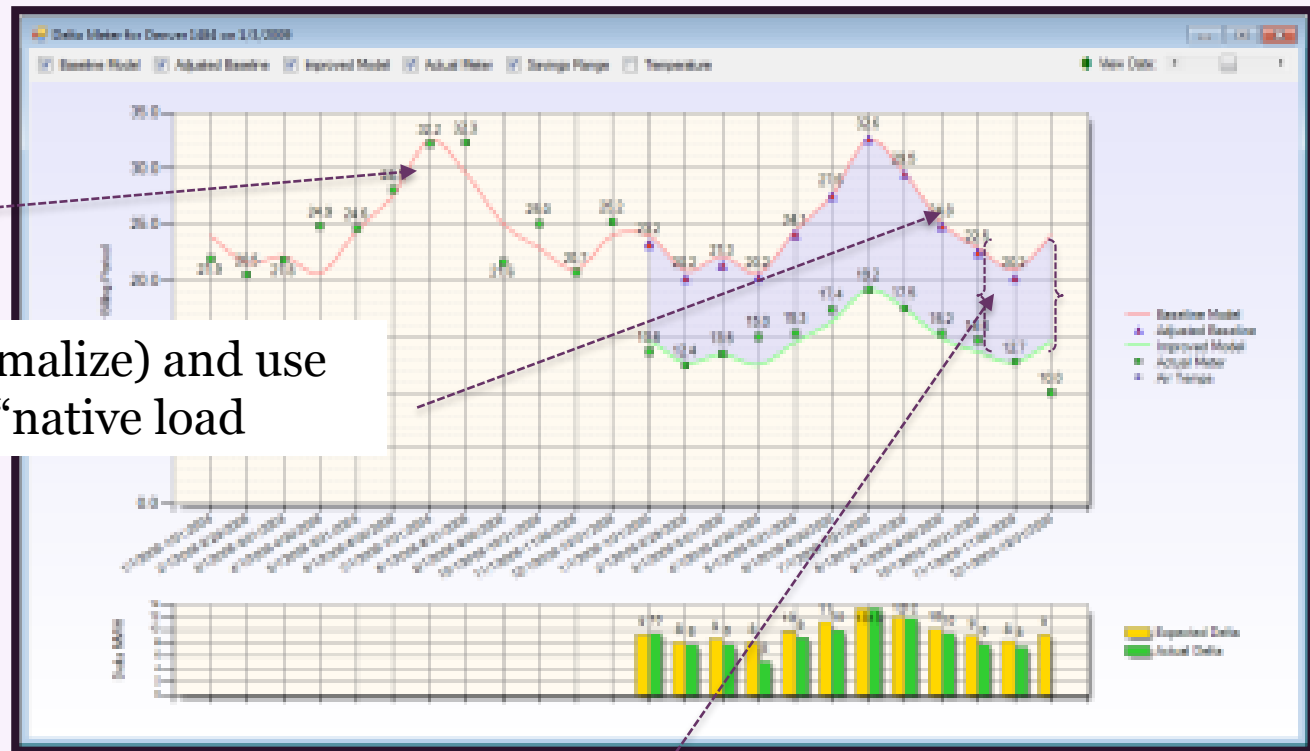
1. Meter it efficiently and accurately over long periods of time
2. Buy and sell it just like generation

# The Meter Calculates Normalized Metered Whole-Building Energy Consumption Based on Current Measurements



Baseline derived from prior use

Calibrate (normalize) and use it to calculate “native load



Efficiency is the difference between native load (normalized baseline), and supplied energy



# Bullitt Center Monthly EE Statement

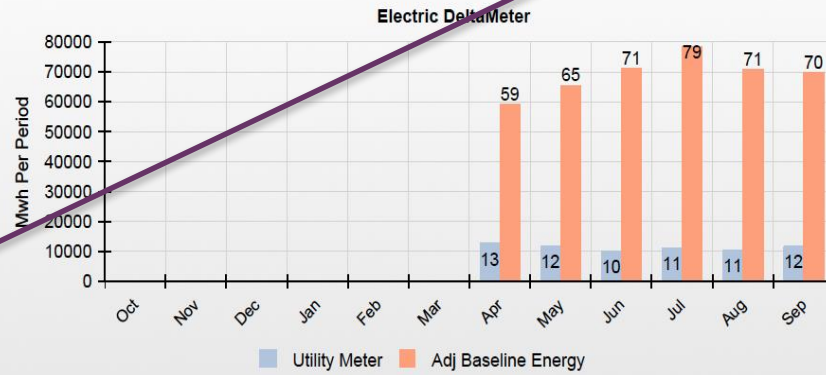
Result is energy units  
of EE placed on the  
utility bill

Service For: **Bullitt Center, 1501 East Madison Street, Seattle, WA 98122**

Statement Date: 10/22/2015    Period: 8/28/2015-9/28/2015    Meter Number: BC1  
Occupancy: 100 %    Days In Period: 32    Average Temperature: 63.13F

### Metered Energy Efficiency Calculation

$$\begin{array}{c} \text{Adj Baseline} \\ \text{Energy} \\ 69,779 \end{array} - \begin{array}{c} \text{Utility} \\ \text{Meter} \\ 11,900 \end{array} = \begin{array}{c} \text{kWh} \\ \text{Yield} \\ 57,879 \end{array}$$



No natural gas usage

# The Metered Energy Efficiency Transaction Structure (MEETS)

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MEETS is a structure, not an incentive

- Designed to use the *savings* value that is currently lost to tenants
- The savings value is often worth 4-15 times the 'incentive' value.

# MEETS

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## EE is *Metered*

- against a dynamic baseline
- and sold to the utility
- under a long-term power purchase agreement

(Meter was accurate = 0.8% during 1<sup>st</sup> year)

# MEETS

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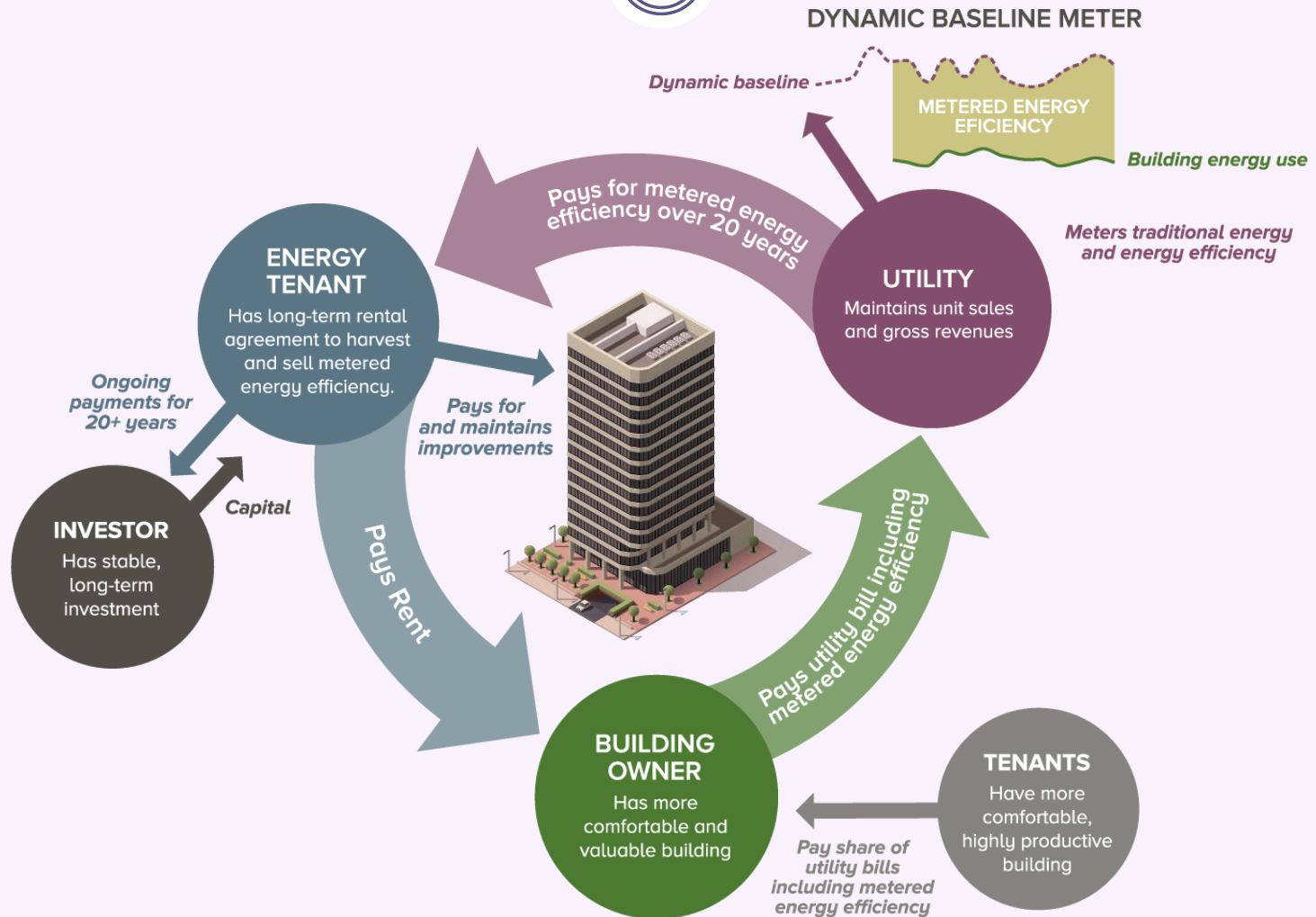
## Utility bills the building for the EE

- in energy units
- at retail rates
- eliminating the split incentive
- The building is paying for delivered EE on its energy bill



# How MEETS Works

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## Old World

Utility Paid (NPV)      \$84,000

NPV sq ft      \$1.68





|                    | Old World | New World |
|--------------------|-----------|-----------|
| Utility Paid (NPV) | \$84,000  | \$740,000 |
| NPV sq ft          | \$1.68    | \$14.80   |

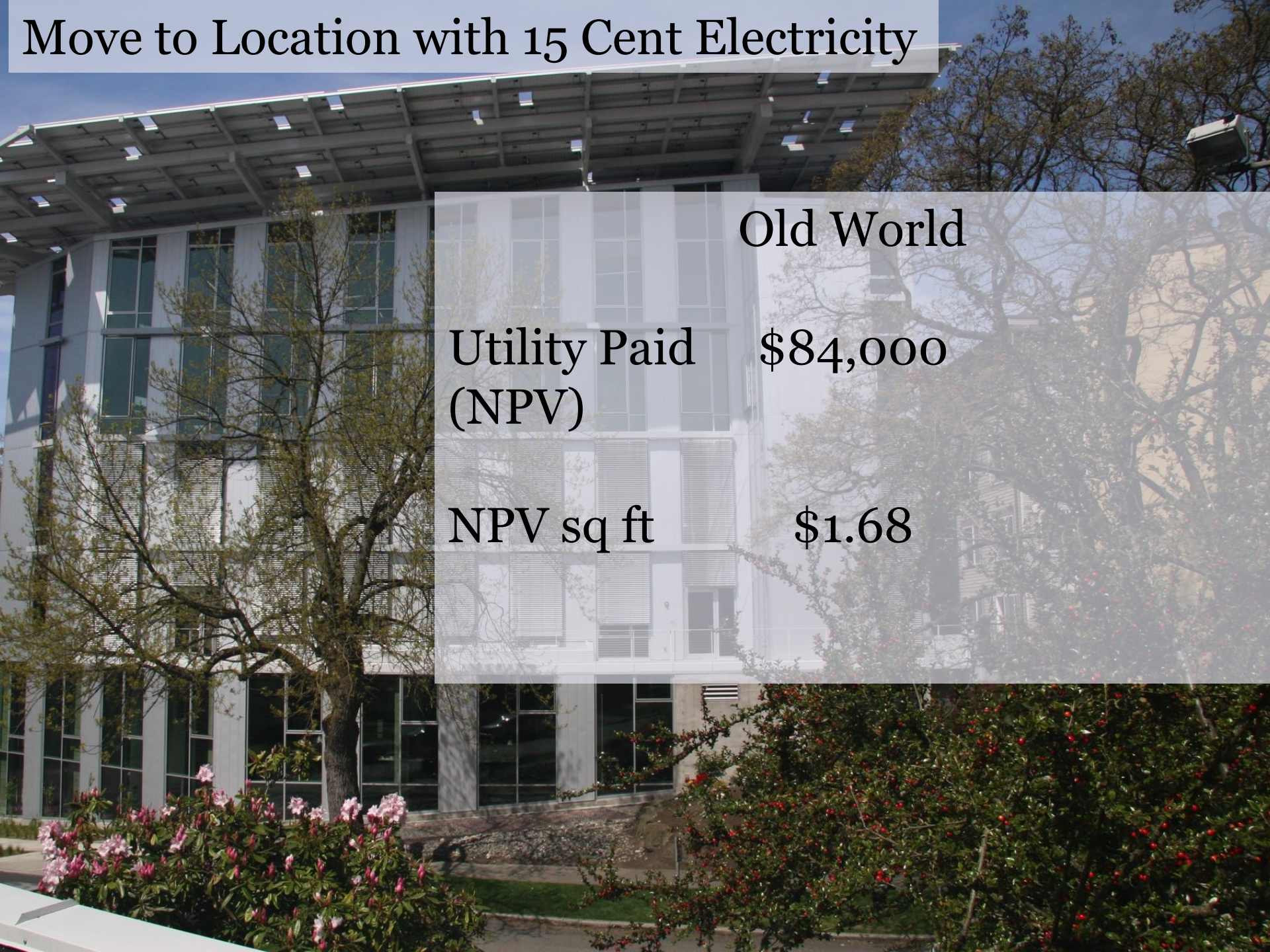


# Move to Location with 15 Cent Electricity

Old World

Utility Paid (NPV) \$84,000

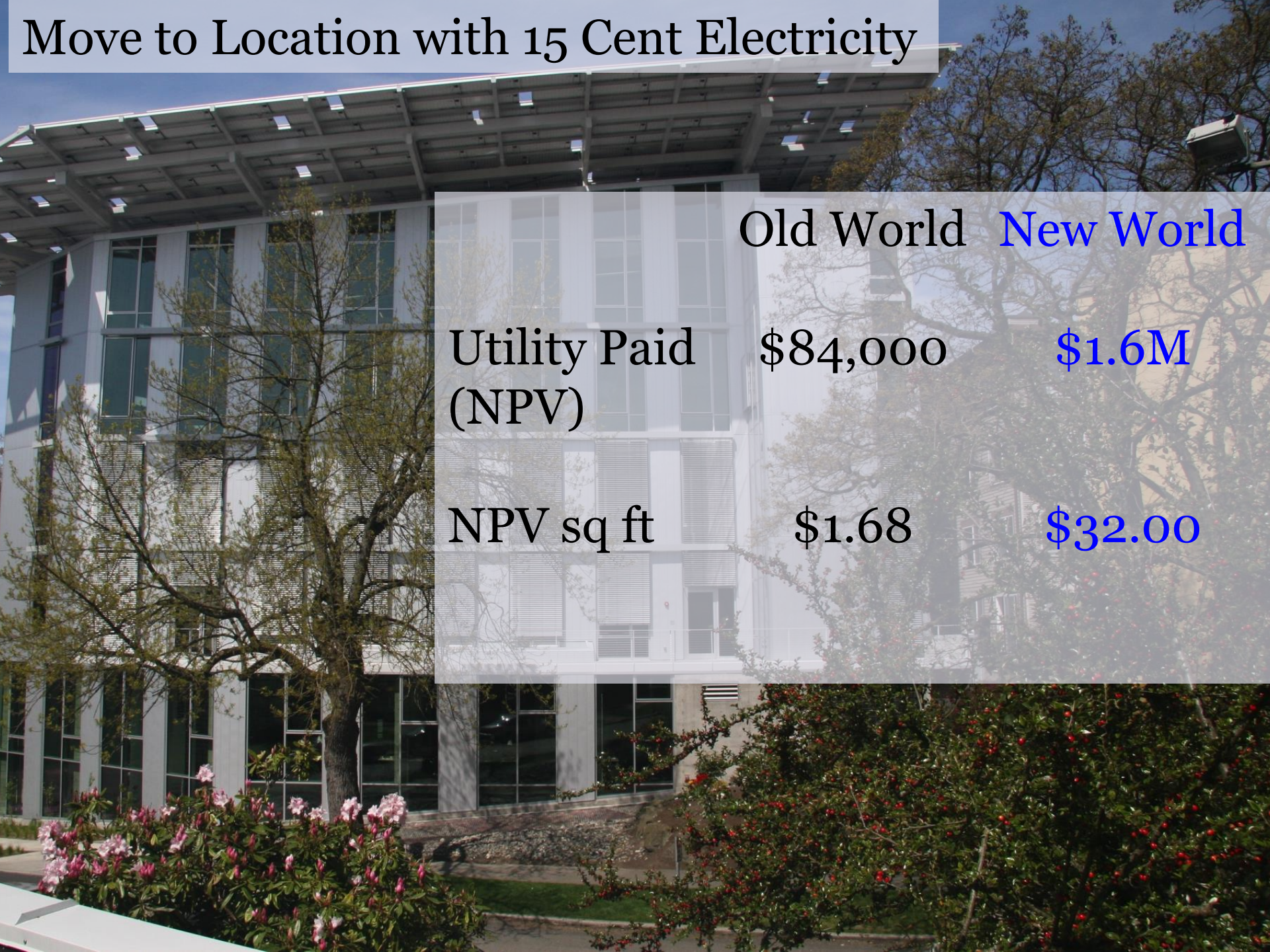
NPV sq ft \$1.68





# Move to Location with 15 Cent Electricity

|                    | Old World | New World |
|--------------------|-----------|-----------|
| Utility Paid (NPV) | \$84,000  | \$1.6M    |
| NPV sq ft          | \$1.68    | \$32.00   |

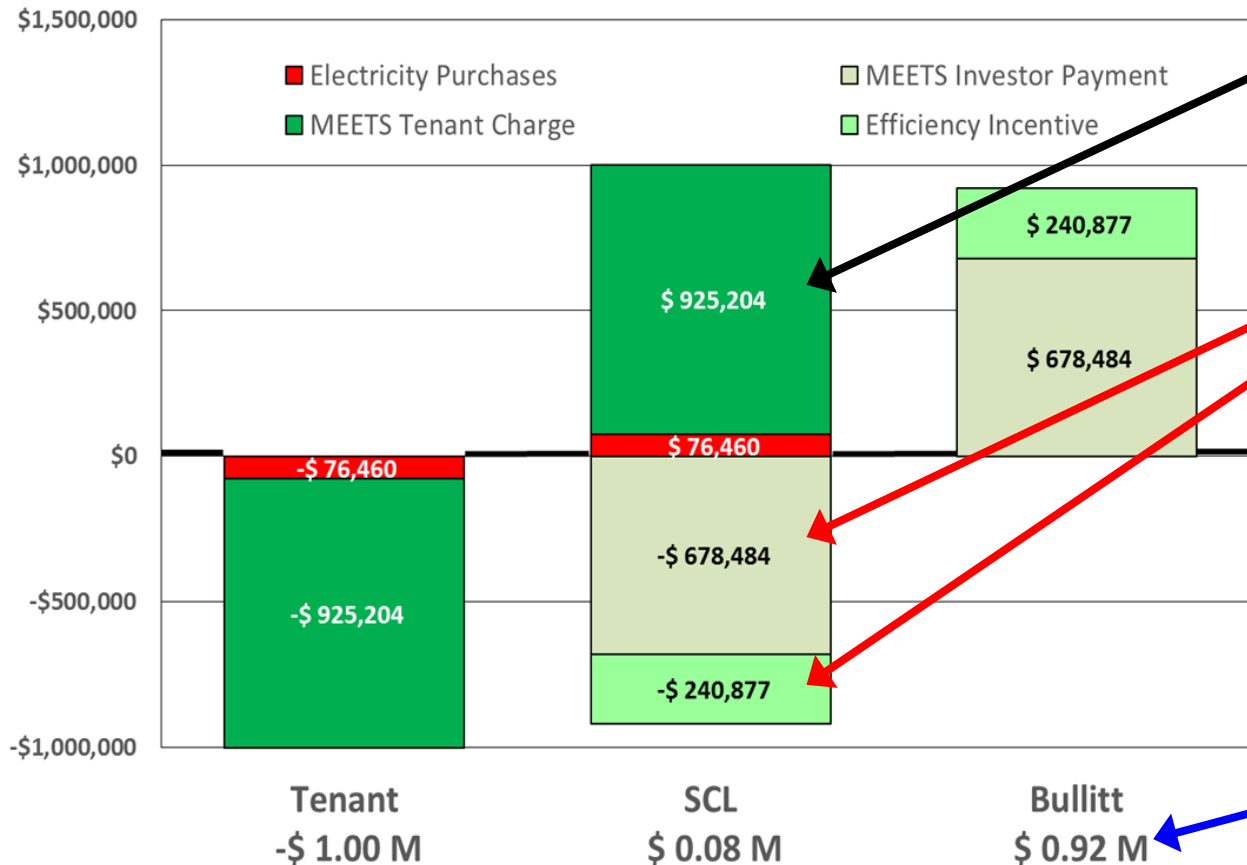




# BULLITT CENTER PROJECTED 20-YR CASH FLOWS

## NPV of Projected 20-year MEETS Cash Flow

Based on first-year, 4.4 % electric rate escalation, 3% discount rate



SCL collects more from the sale of MEETS energy than it pays out under the MEETS PPA.

In addition, SCL did not pay out \$84,000 in upfront incentives.

Investor receives \$0.92M, rather than \$84,000.

# MEETS Benefits

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## Utility

New Load Management Resource  
Location-Specific and Reliable  
Only Pay for Units Received  
Rate-baseable: Earnings Opportunity  
No Revenue Loss

## Building Owner

New 20 to 30 Year Tenant  
New Revenue Stream  
Increased Building Value  
Frees Up Capital  
Owner Stays Out of Energy Business

## Investors

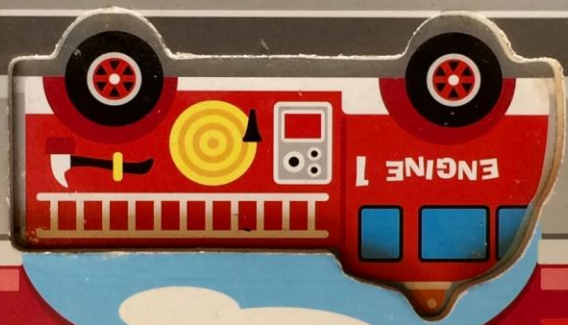
Finance Based on Utility PPA  
Strong Counterparty  
Lower and Rated Payment Risk  
Well-Understood Instruments  
Scale Through Aggregation

## Society

Domestic Jobs  
Environmental Benefit  
Enhanced Building Stock  
Price Stability  
No Tax Dollars Required  
No Incentives Required

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# Contact Information

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# Seattle City Light Slides Follow

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## LESSONS LEARNED

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- **MEETS is more complicated for new construction,** easier for existing buildings
- **Longer-term contractual arrangements can be beneficial**
- **Leases must ensure that tenants pay retail cost of baseline consumption**

## LESSONS LEARNED CONTINUED

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- Adjusting for non-routine changes over time requires **dedicated tracking** of operations
- Assessment of **administrative charges** by the utility is necessary
- Metered efficiency rates must **segregate real and virtual energy** for **taxation and accounting purposes**

# SUCCESSSES

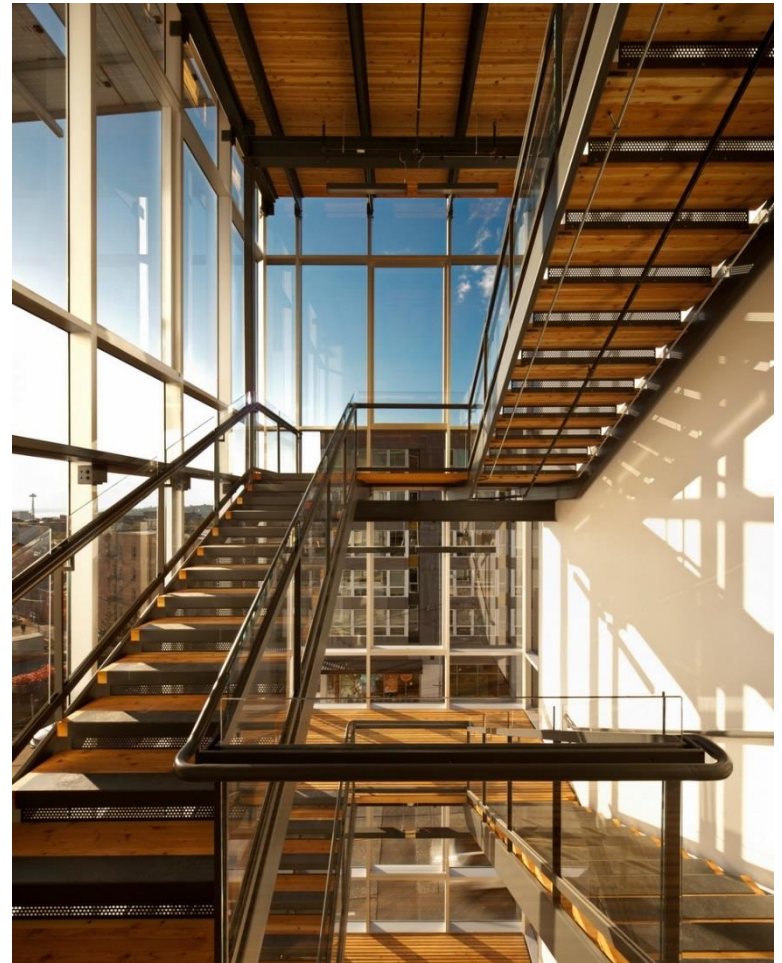
- Provides structure to get deep in a building
- Separates relationships cleanly
- Allows for flexibility between owner/tenant
- Overcomes many challenges presented by “split incentive” barrier



Source: [www.bullittcenter.org](http://www.bullittcenter.org)

# CHALLENGES

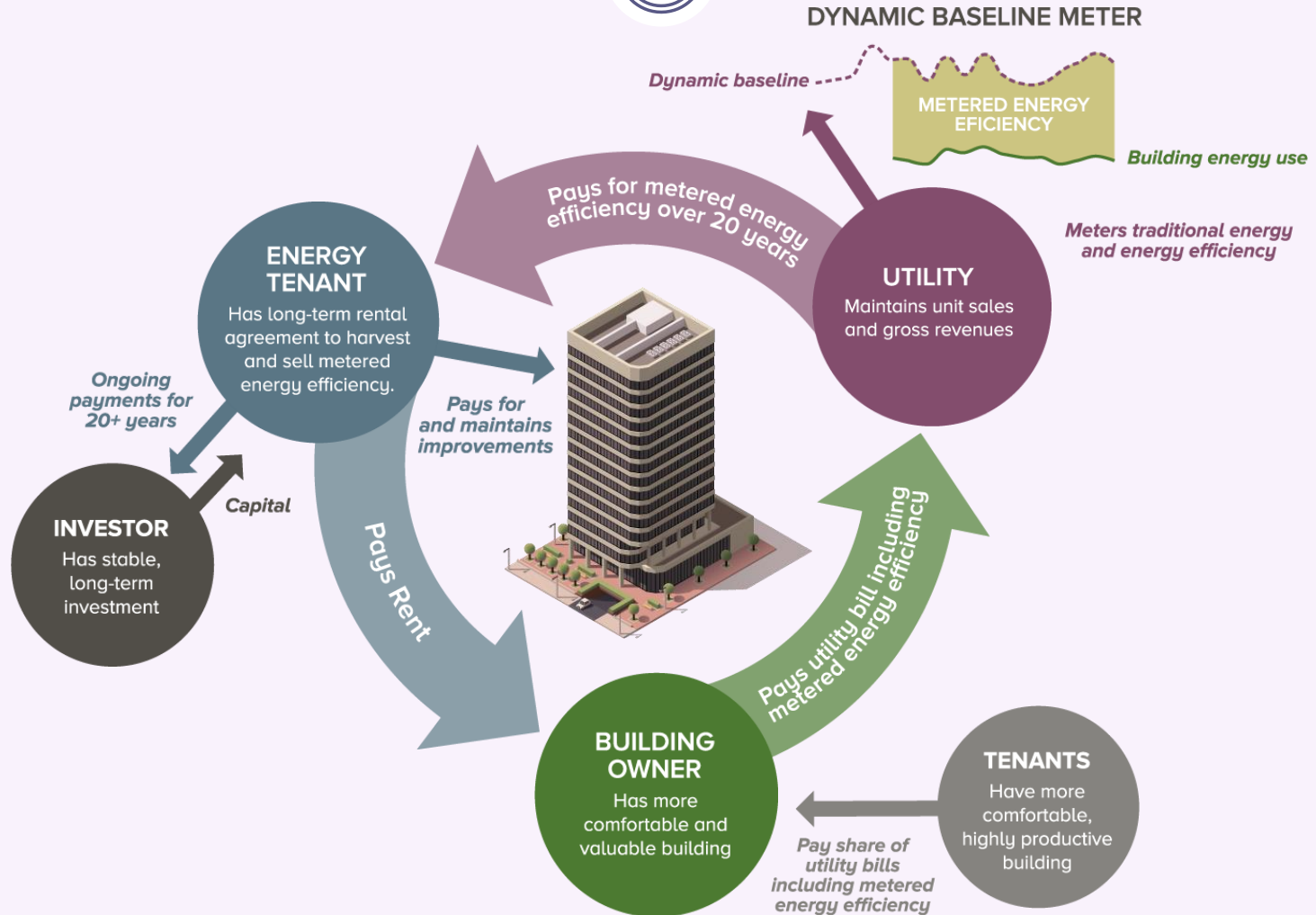
- Baseline (particularly in new construction)
- Billing/Metering
- Procedural/Administrative
- Contract authority



Source: [www.millerhull.com](http://www.millerhull.com)

# How MEETS Works

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# Supplemental Slides Follow

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# MEETS & PACE

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| Issue to Address                   | PACE                                   | MEETS                               |
|------------------------------------|--|-------------------------------------|
| Split Incentive Addressed?         | ✓☐ assuming tenants pay property taxes | ✓☐ assuming tenants pay energy bill |
| New Revenue to Building Owner      | ✗                                      | ✓☐                                  |
| Senior Mortgage Holder Signoff     | Probably required                      | Not required                        |
| Viable Counterparty                | ✓☐ - Taxing Authority                  | ✓☐ - Utility                        |
| Metered EE                         | ✗ - Could be added                     | ✓☐                                  |
| Transaction Type                   | Loan                                   | Energy Sale                         |
| Utility Unit Erosion Solved?       | ✗                                      | ✓☐                                  |
| Utility Gross Revenue Loss Solved? | ✗                                      | ✓☐                                  |
| Utility Load Management            | ✗                                      | ✓☐                                  |

# Why MEETS Matters

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## 50,000 Square Foot Bullitt Center with Retail Energy Price of 6 cents/kWh

|  | Traditional<br>Incentive Structure | MEETS  |
|--|------------------------------------|--|
| Total Dollar Value of Utility Payments for EE                  | \$84,000 (incentive)               | \$1.22 million (PPA)                                 |
| Total Utility Collections from Building for Saved Energy       | \$0                                | \$1.25 million                                       |
| Ratepayer Cost or (Benefit)                                    | \$84,000                           | (\$33,000)   |
| NPV Dollar Value of Payments to Building<br>(5% Discount Rate) | \$84,000                           | \$740,000  |
| \$NPV per Square Foot  | \$1.68                             | \$14.80  |
| Utility Payment per kWh  | 2.5 cents (deemed & paid upfront)  | 8.41 cents with escalator, as delivered for 20 years |

# Why MEETS Matters

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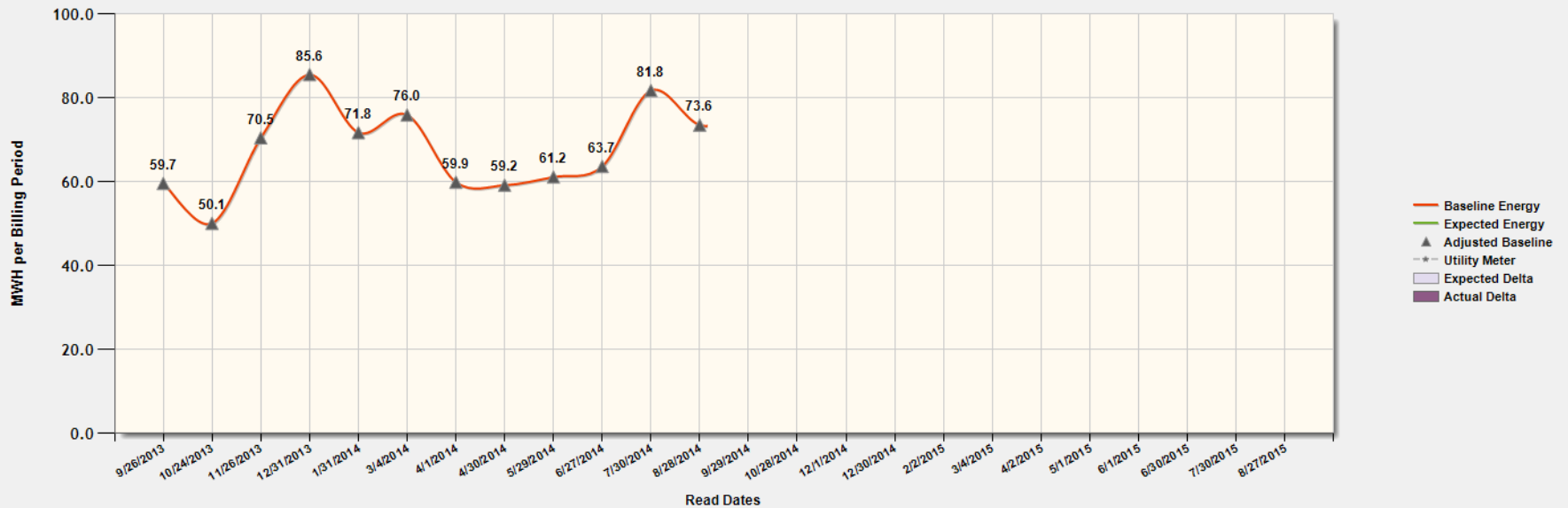
50,000 Square Foot of Office Building with  
Retail Energy Price of **15 cents**/kWh

|  | Traditional<br>Incentive Structure | MEETS  |
|--|------------------------------------|--|
| Total Dollar Value of Utility Payments for MEETS Energy        | \$84,000 (incentive)               | \$2.6 million (PPA)                                  |
| Total Utility Collections from Building for Saved Energy       | \$0                                | \$3 million  |
| Ratepayer Cost or (Benefit)                                    | \$84,000                           | (\$353,000)  |
| NPV Dollar Value of Payments to Building<br>(5% Discount Rate) | \$84,000                           | \$1.6 million  |
| \$NPV per Square Foot  | \$1.68                             | \$32.00  |
| Utility Payment per kWh  | 2.5 cents (deemed & paid upfront)  | 17.5 cents with escalator, as delivered for 20 years |

# Dynamic Baseline Meter

(EnergyRM's DeltaMeter®)

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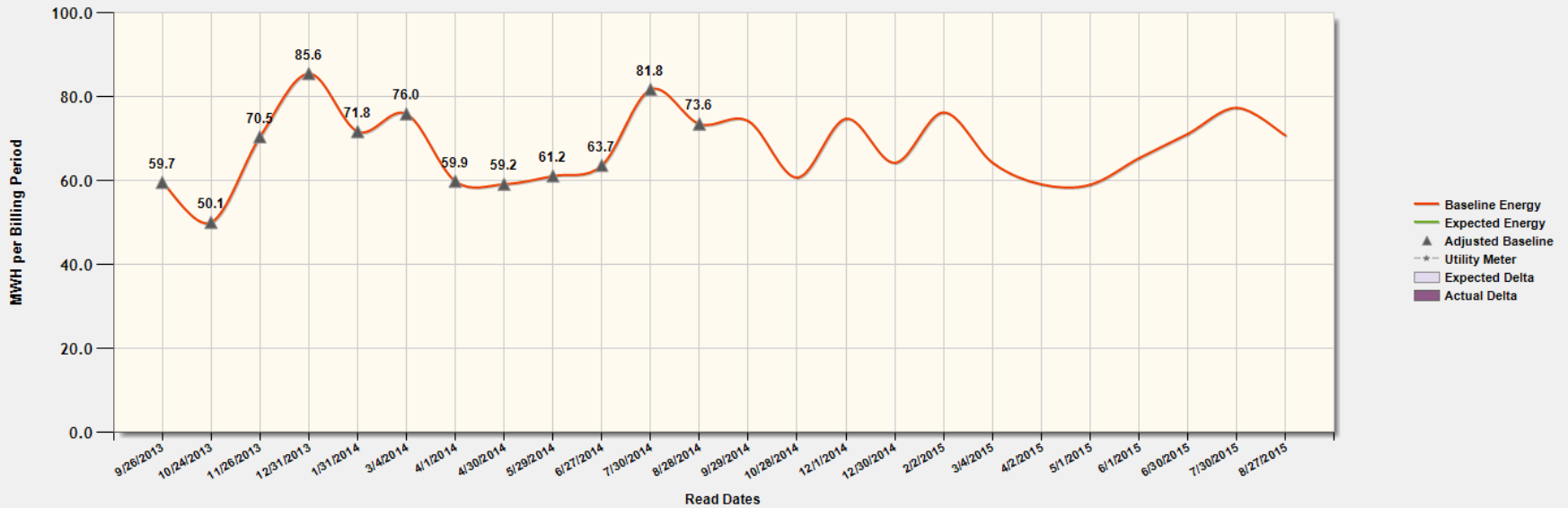


Create historical baseline using Option D modeling

# Dynamic Baseline Meter

(EnergyRM's DeltaMeter®)

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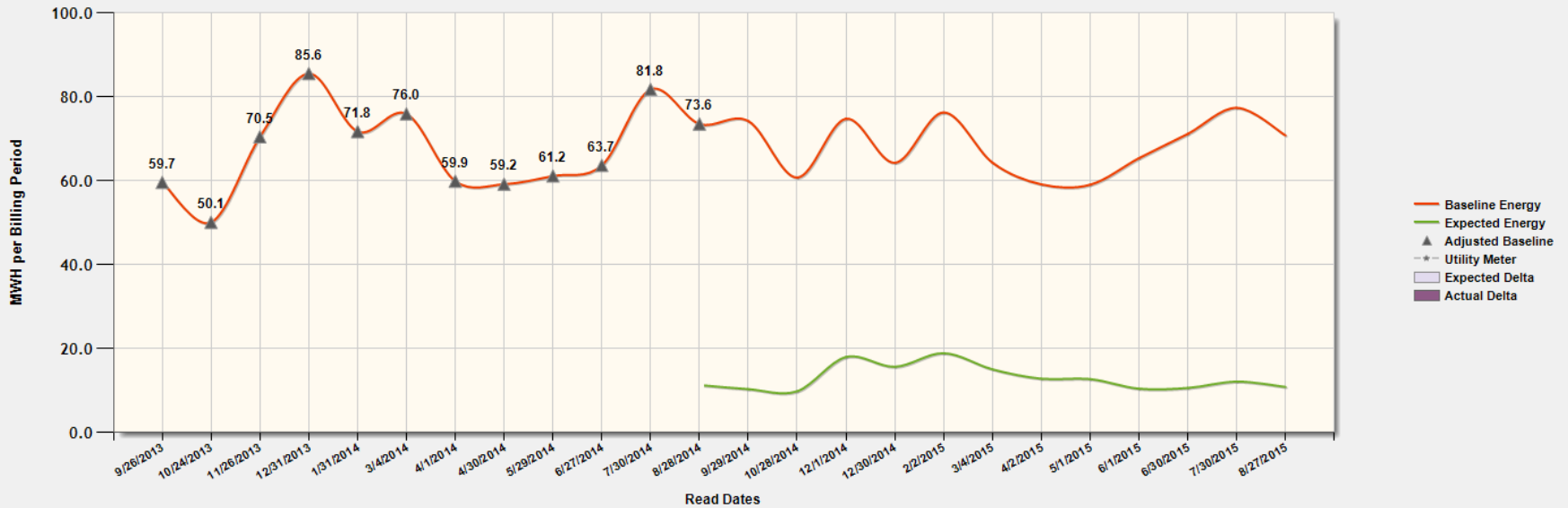
Project baseline forward using standard meteorological year



# Dynamic Baseline Meter

(EnergyRM's DeltaMeter®)

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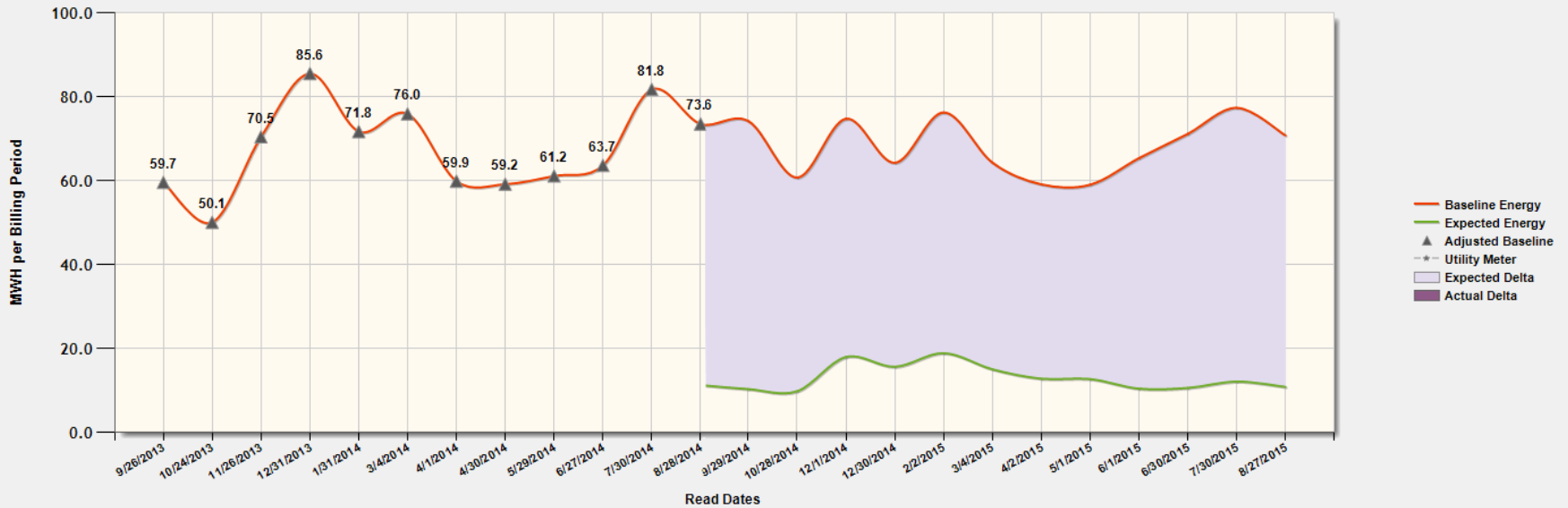


Estimate energy use post-retrofit design and TMY  
(green line)

# Dynamic Baseline Meter

(EnergyRM's DeltaMeter<sup>®</sup>)

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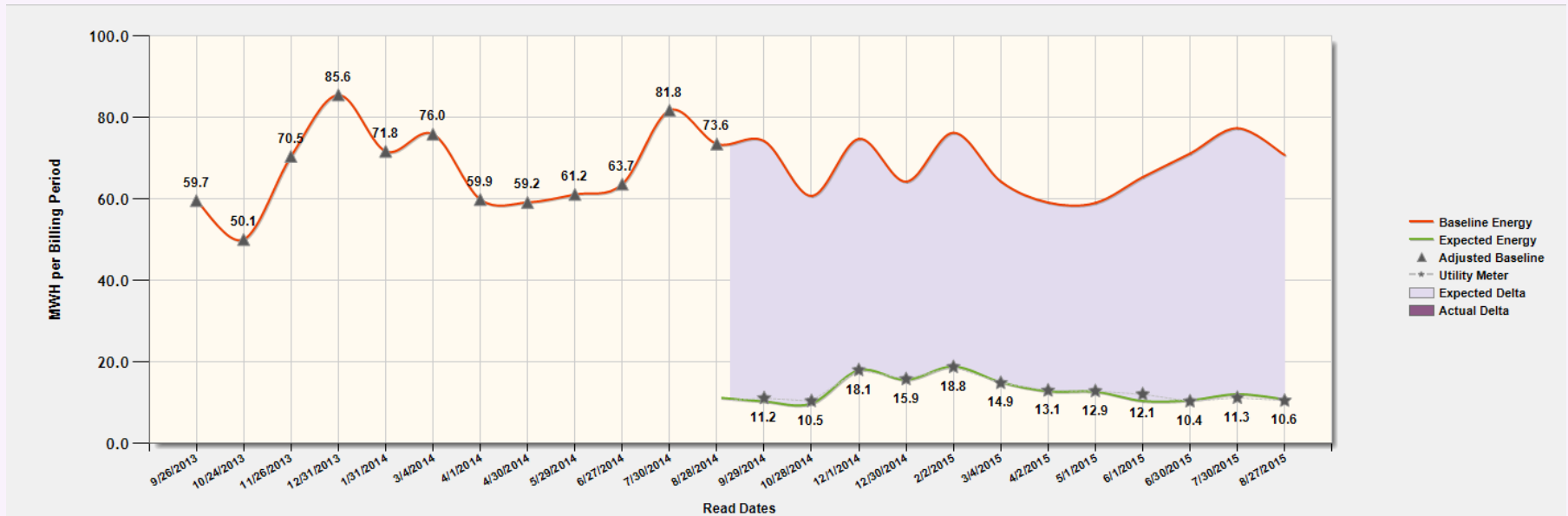


Calculate estimated EE “yield” from retrofit  
(purple shaded area)

# Dynamic Baseline Meter

(EnergyRM's DeltaMeter®)

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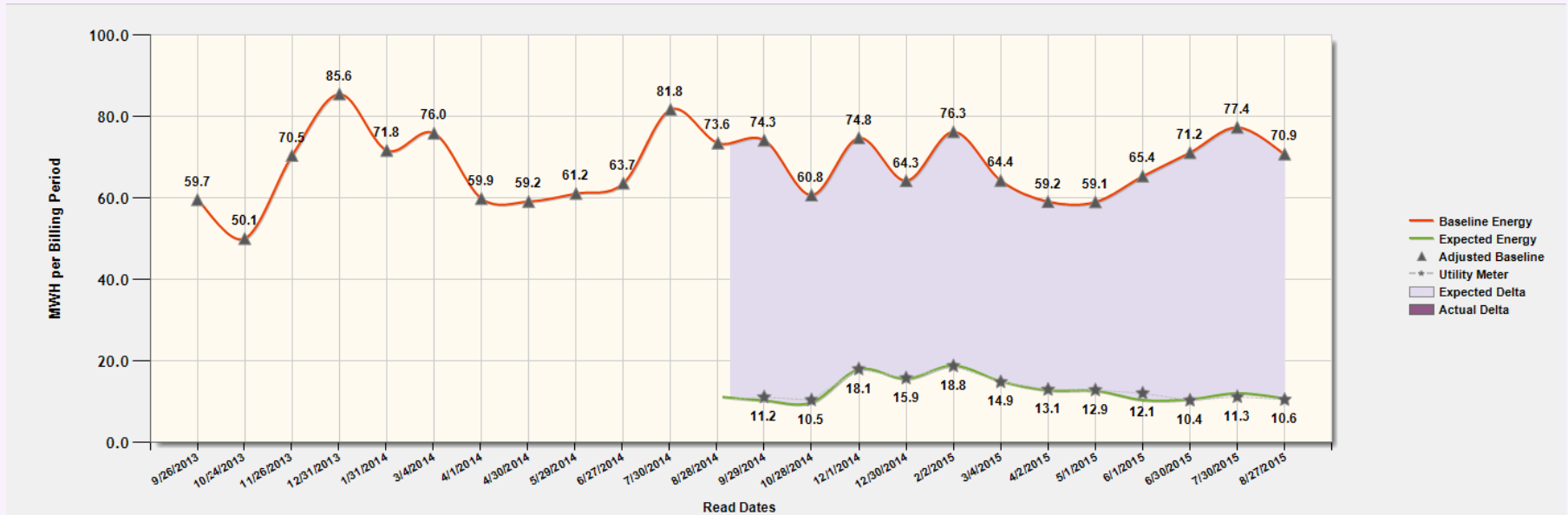


Input utility meter readings as they become available  
(numbers near green line)

# Dynamic Baseline Meter

(EnergyRM's DeltaMeter®)

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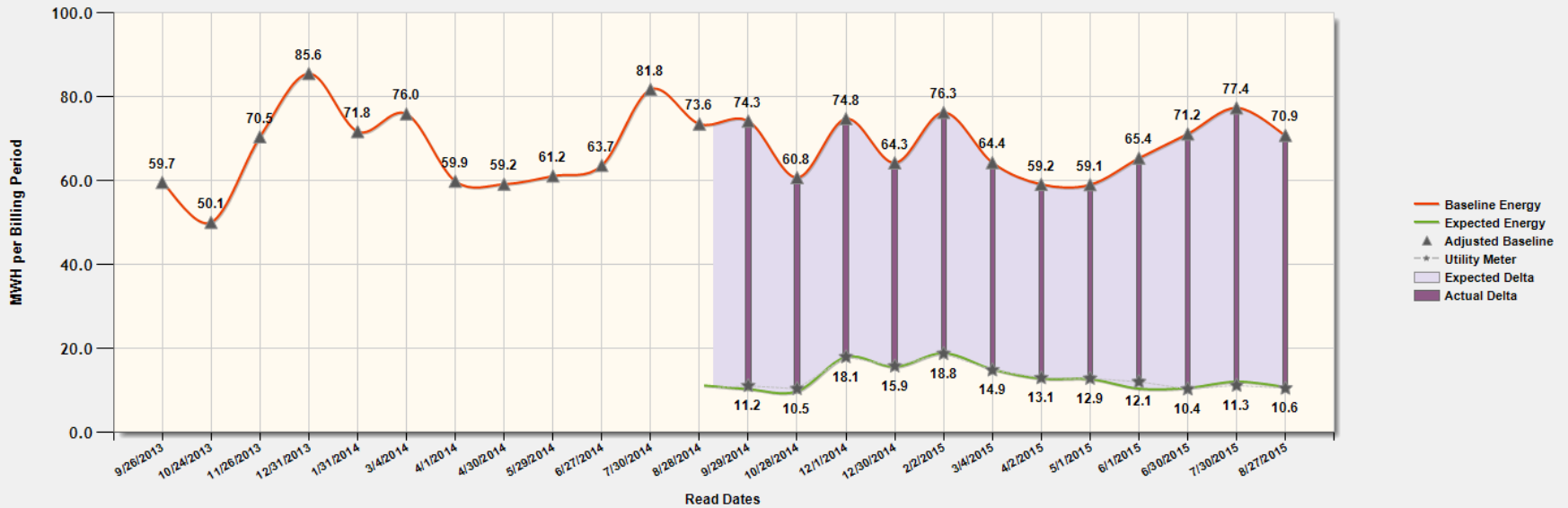
Adjust *dynamic* baseline for routine and non-routine changes  
(numbers near red line)



# Dynamic Baseline Meter

(EnergyRM's DeltaMeter®)

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Utility pays the *difference* between the utility meter read and the adjusted dynamic baseline (purple bars)