PROPOSAL FOR A NEW DEEP RETROFIT PROGRAM

2011 ACEEE NATIONAL CONFERENCE ON ENERGY EFFICIENCY AS A RESOURCE

EXECUTIVE SUMMARY

- In light of state policies requiring increased levels of energy efficiency and other forms of demand-side management (DSM), utilities across the U.S. are seeking to expand their offerings.
- New types of DSM programs that incentivize “deep” retrofits can encourage a new focus on the “whole building” perspective and invite customers, service providers, and utility program managers to work together toward substantial energy savings.
- This presentation will highlight one proposal to incentivize “deep” retrofits

TO ACHIEVE HIGHER LEVELS OF SAVINGS, UTILITY PROGRAMS WILL HAVE TO GO BROADER AND DEEPER

Breadth

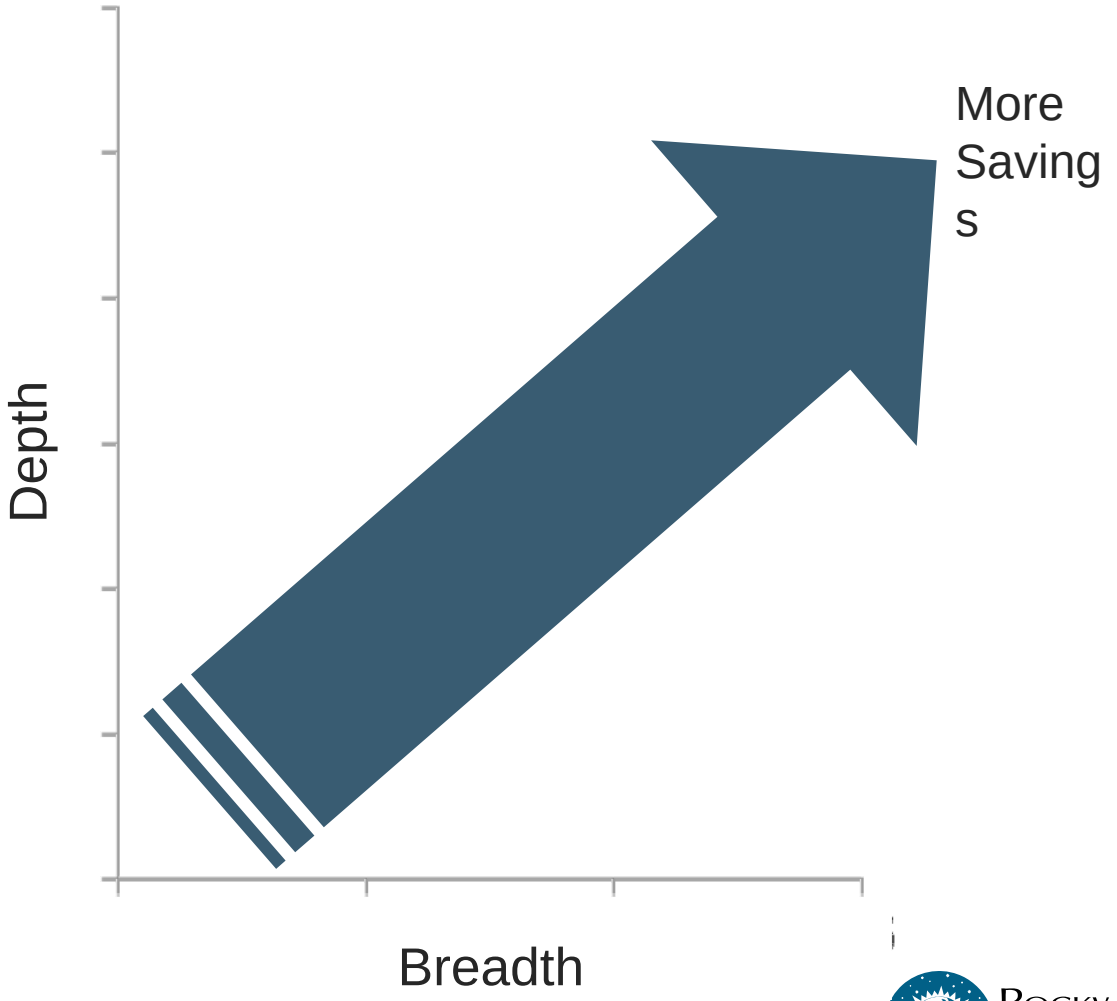
The number of program participants

- attracting new customers
- targeting new market segments

Depth

The amount of savings per customer

- installing more measures
- Implementing more advanced measures
- addressing more end-uses



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A DEEP RETROFIT REQUIRES USING THE RIGHT STEPS IN THE RIGHT ORDER

1. Define the specific end-user needs
2. Understand the existing building structure and systems
3. Understand the scope and costs of planned or needed renovations
4. Reduce loads
5. Select appropriate and efficient HVAC systems
6. Find synergies between systems and measures
7. Optimize controls
8. Realize the intended design

CASE STUDY: EMPIRE STATE BUILDING

Background

- 102 stories, **2.8** million square feet
- **$11 million** in annual energy costs
- Peak demand **9.5** MW (2.8 W/ sq ft including HVAC)
- **88** kBtu/ squ ft/ year in office space
- CO_2 footprint of **25,000** tons per year (9 tons/ 1000 sq ft)

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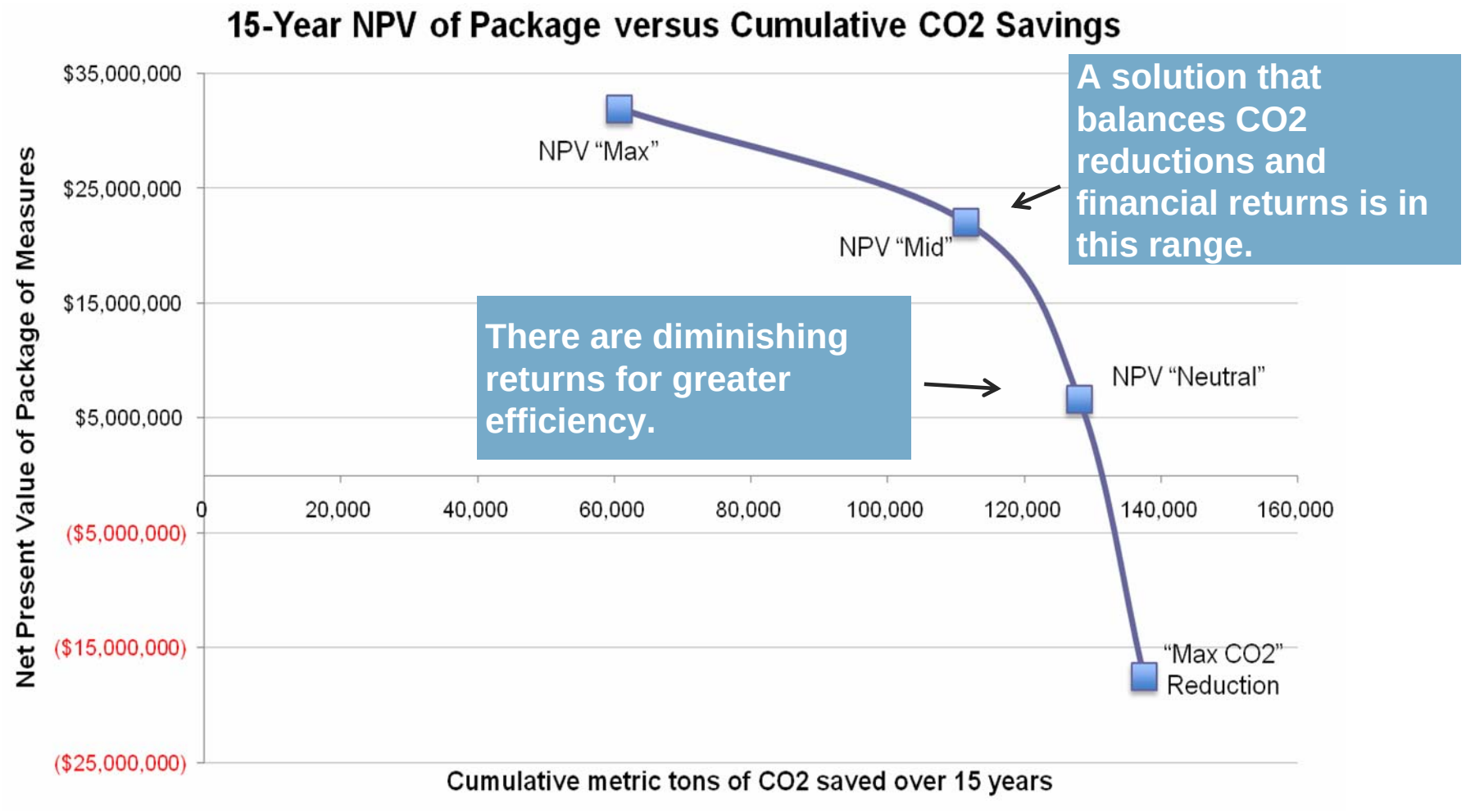
PROJECT UTILIZED AN ITERATIVE PROCESS BALANCING FINANCIAL AND CARBON IMPACTS



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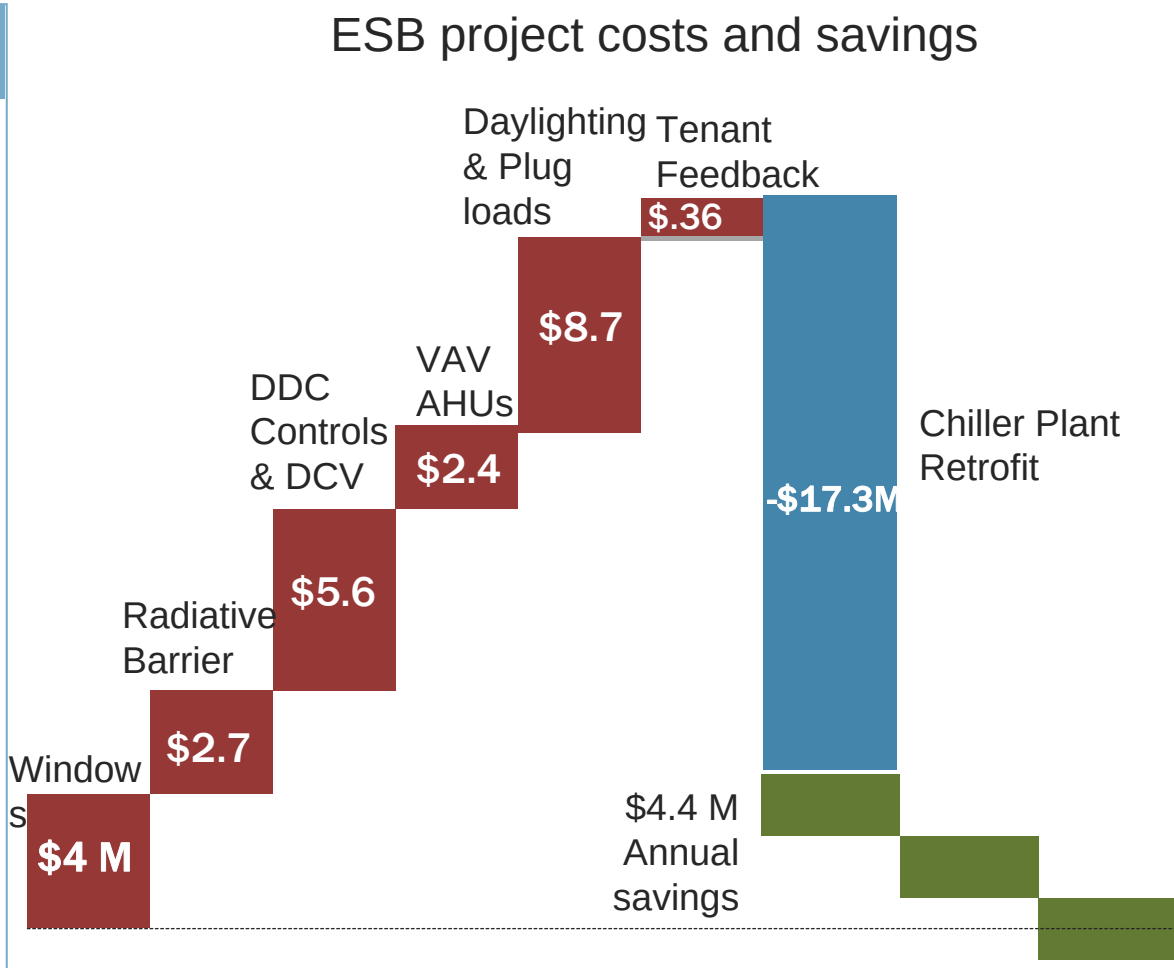
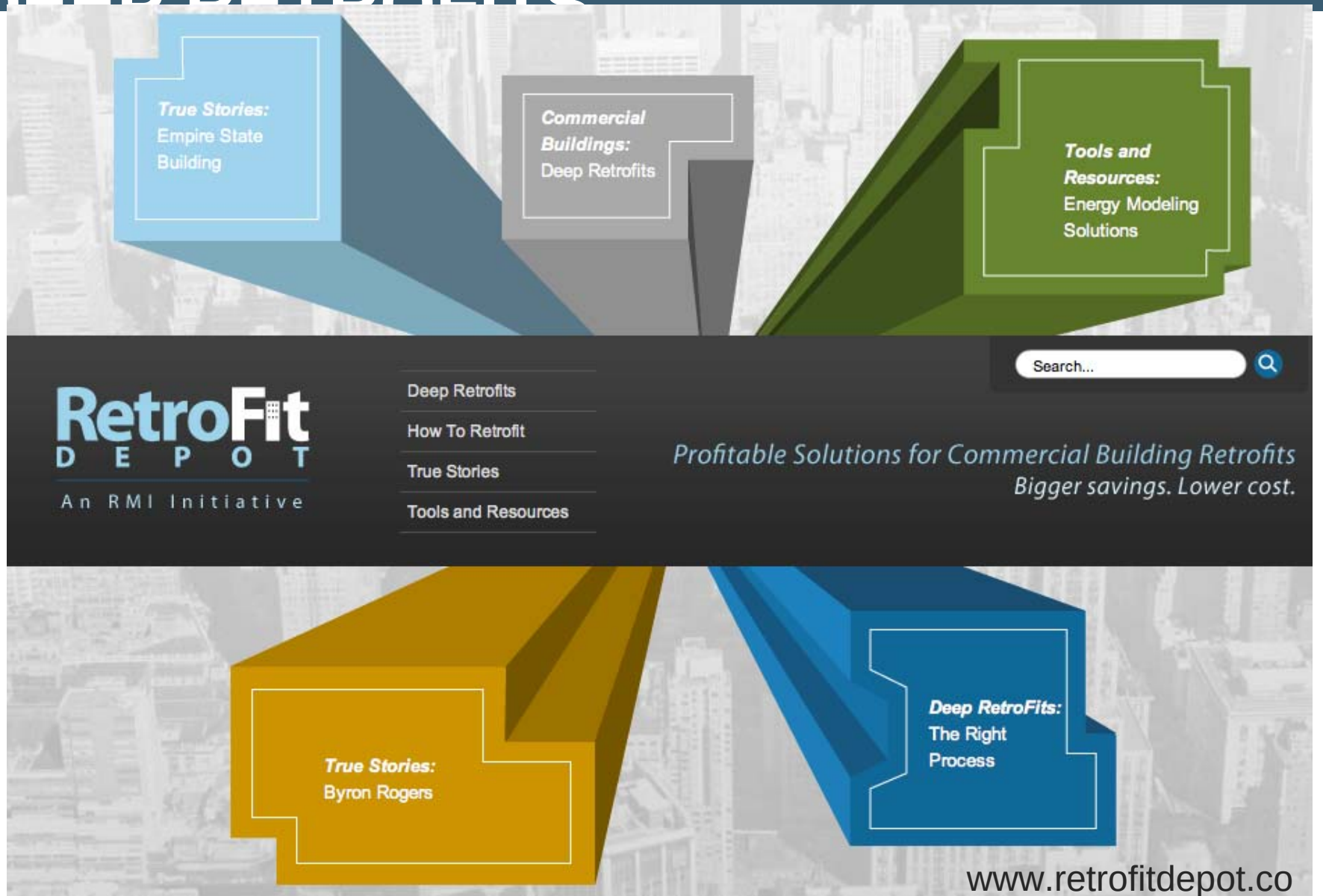
EXPECTED PROJECT RESULTS DROVE SIGNIFICANT ENERGY SAVINGS IN A LANDMARK BUILDING

Results

- **38%** energy savings
- Simple payback under **3 years**
- Recently obtained **LEED Gold** certification
- Energy Star rating: **Top 12%** of U.S. office buildings
- **33%** reduction in cooling load
- Savings of **$4.4 million** annually



RMI'S RETROFIT INITIATIVE LOOKING TO ACCELERATE THE ADOPTION OF DEEP RETROFITS



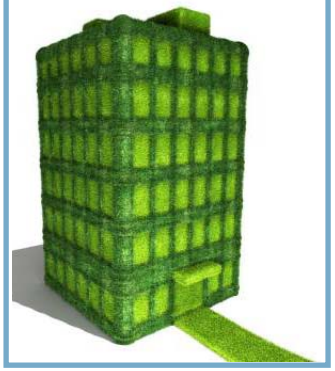
DESCRIPTION FOR PROPOSED "DEEP ENERGY EFFICIENCY PAYS (DEEP)" PROGRAM

Objective

Obtain deeper levels of cost-effective energy savings

Target

Large "commercial" buildings (~>75,000 sf)



Theory

Avoid the lost efficiency opportunities caused by "cream-skimming" energy efficiency measures and promoting a "Whole Building" approach for deeper savings

Mechanism

- incentive (additional 20%) for projects that reach a certain level of energy savings (~25%)
- Leverage the existing programs (either custom and/or prescriptive) to put together a "Whole Building Retrofit"
- Large projects with deep savings provide the ability to enable access to financing mechanisms such as performance contracting
- Require that service providers guarantee or warranty the outcome of their work

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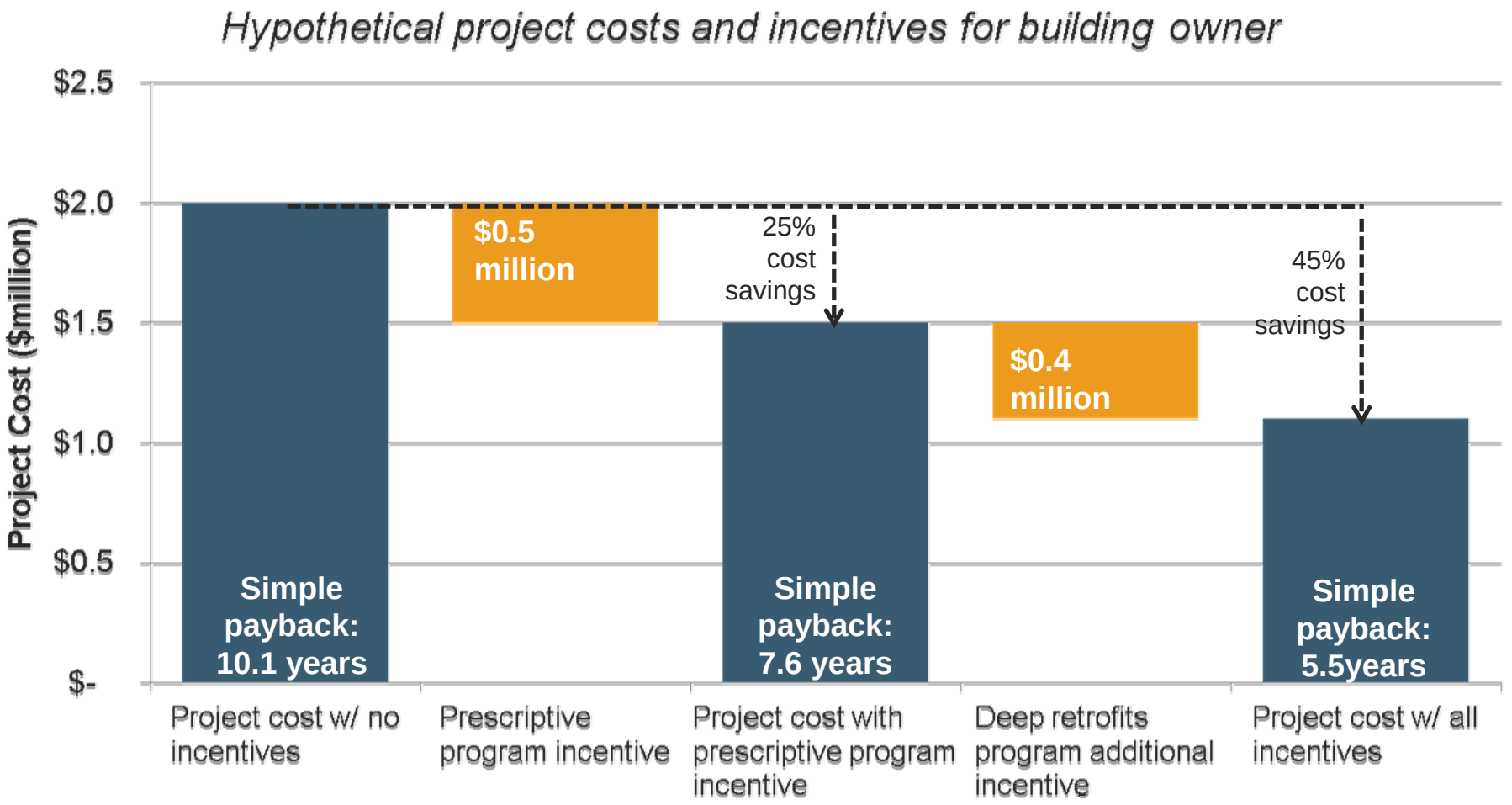
THE DEEP PROGRAM— FROM A SINGLE PROJECT PERSPECTIVE



Note: project would only qualify for additional savings if it meets % savings threshold

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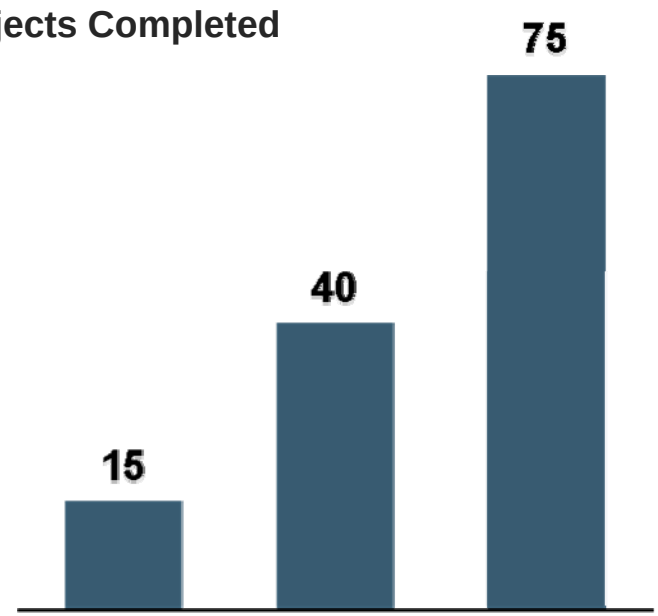
THE DEEP PROGRAM— FROM A PROGRAM PORTFOLIO PERSPECTIVE

CUMULATIVE Impact



	2012	2013	2014
Cost	$4.4M	$11.8M	$22.1M
GWh Saved	8	21	38

Program Highlights

75 buildings over three years

38 million kWh savings (incremental)

$22M budget

1.6 Total Resouce Cost score

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Benefits of the DEEP program for different stakeholders

Utility

- Allows utilities to leverage expertise and financial capital of the private sector
- Targeting large customers allows for major impacts with small transaction costs
- The program could drive spillover into existing programs
- With experience gains in large buildings, markets could transform to allow for deeper savings in other sectors

Customer

- Support for an “integrated design” approach
- The program would provide assistance for identifying and and bundling funding support for efficiency projects
- Align interests to capture maximum value

Third-party provider

- Creates a streamlined process that minimizes administration costs
- Will transform the local marketplace among energy efficiency service providers by setting the bar for future projects

CRITICAL ISSUES FOR THE DEEP PROGRAM

1. Delivery and marketing will be through existing credible energy service / energy efficiency providers. A qualification should be required to assure credibility

2. Existing utility resources can be utilized to administer the program

3. Utility account executives can be leveraged for customer education

4. Additional resources will be required to review and approve the projects

5. M&V requirements will be necessary to ensure the projects deliver the value

NEXT STEPS

More research needed as this concept evolves into a material program:

•What is the right threshold level for a deep retrofit?

•What are the barriers associated with a whole-building measurement and verification approach?

•How can utilities leverage the experience of the private sector while meeting the needs of regulatory bodies?

•Can transaction costs associated with program participation be minimized to encourage signification interest?

THANKS!

PAPER WILL BE AVAILABLE AT: WWW.INSITUTEBE.COM BY OCT 11

FOR MORE INFO, CONTACT:

MATHIAS BELL
(MBELL@RMI.ORG)

KELLY SMITH
(KELLY.R.SMITH@JCI.COM)

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