



Steven Winter Associates, Inc.  
Building Systems Consultants

HR&A  
Analyze. Advise. Act.

# Recognizing the Benefits of Energy Efficiency

*Changing the Fundamentals of Multifamily Underwriting*



**The Deutsche Bank Americas Foundation & Living Cities**

ACEEE 2011 Symposium on Market Transformation | 4.12.11

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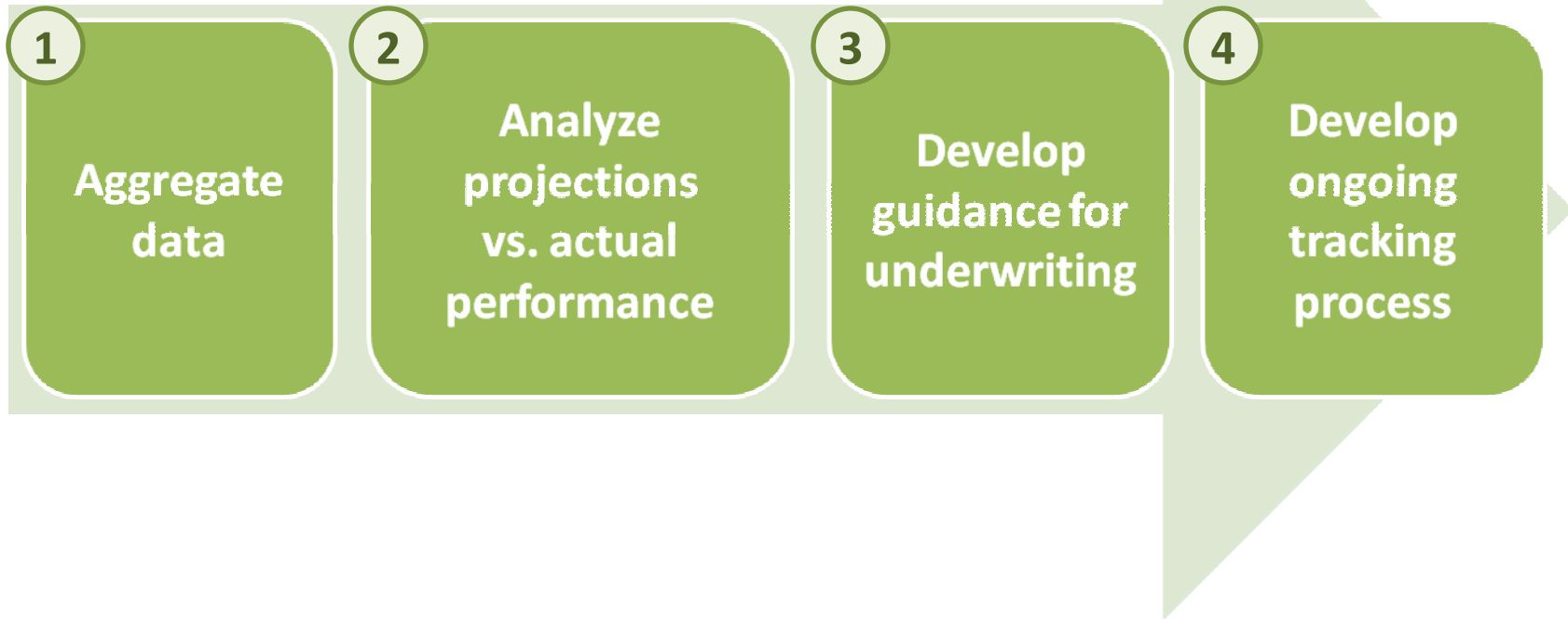
next steps

**challenges** A paucity of data concerning the efficacy of energy retrofits

Lack of interaction between the worlds of building science & finance

**response** Build a set of reliable data to change *underwriters' practices* to incorporate energy efficiency

## approach



Goal of analyzing 20,000 affordable housing units in NYC

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# Current practices

## 1. Risk aversion dominates process

- Guided by standards and/or historic usage
- No incorporation of forward-looking projections

## 2. Structural considerations

- Appraisers rely on indexes and comparables

# Challenges

## 1. Lack of Motivation

- Potential savings represent small % of building's finances
- Market interest unclear
- Lack of owner equity
- Lack of knowledge re: benefits



# Challenges

1. Lack of Motivation

2. Lack of Data or Verifiable Standards

- No existing universal dataset
- Lack of M&V
- Lack of universal data standards or 3<sup>rd</sup> party verification

# Challenges

1. Lack of Motivation

2. Lack of Data or Verifiable Standards

3. External Risk Factors

- External unpredictability: *weather, costs, market*
- Human error and behavior

# Challenges

1. Lack of Motivation

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3. External Risk Factors

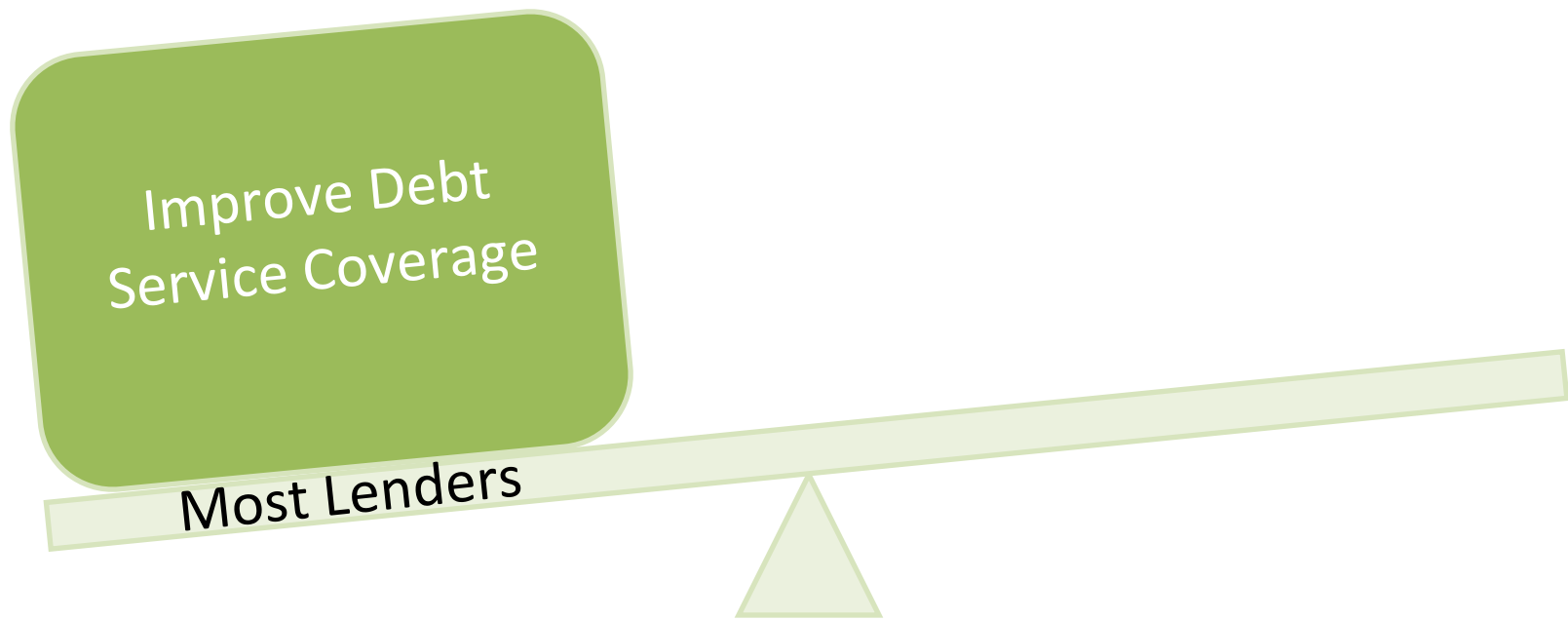
4. Structural & Regulatory Impediments

- Lender-side: *economic climate, multi-player process*
- Borrower-side: *affordable housing utility allowances*

# Potential benefits

Higher energy performance will:

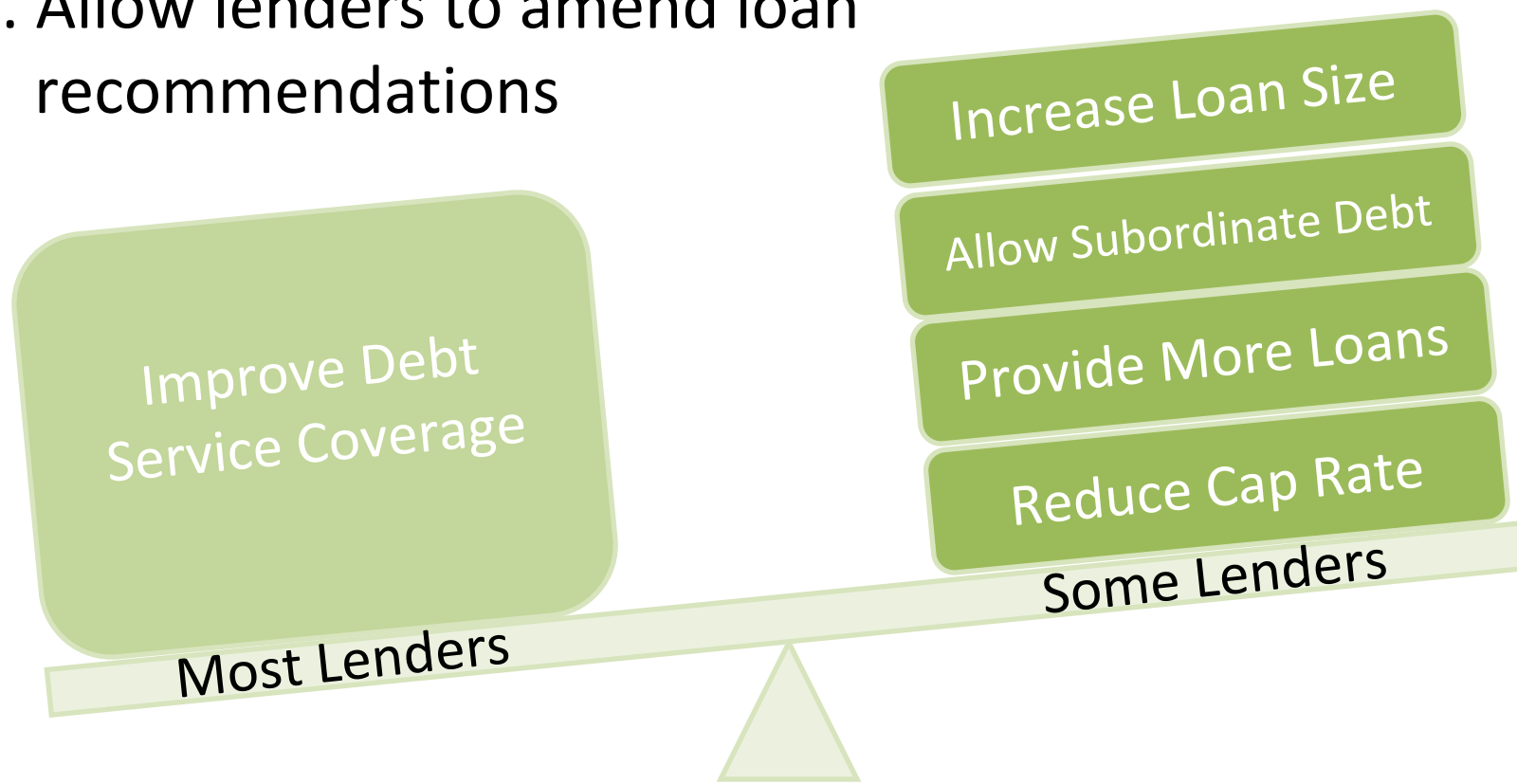
1. Reduce risk by increasing cash flows



# Potential benefits

Higher energy performance will:

1. Reduce risk by increasing cash flows
2. Allow lenders to amend loan recommendations



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# Case Study Properties



1. 19-unit pre-war



2. 102-unit modern

# Case Study #1: 19-unit pre-war

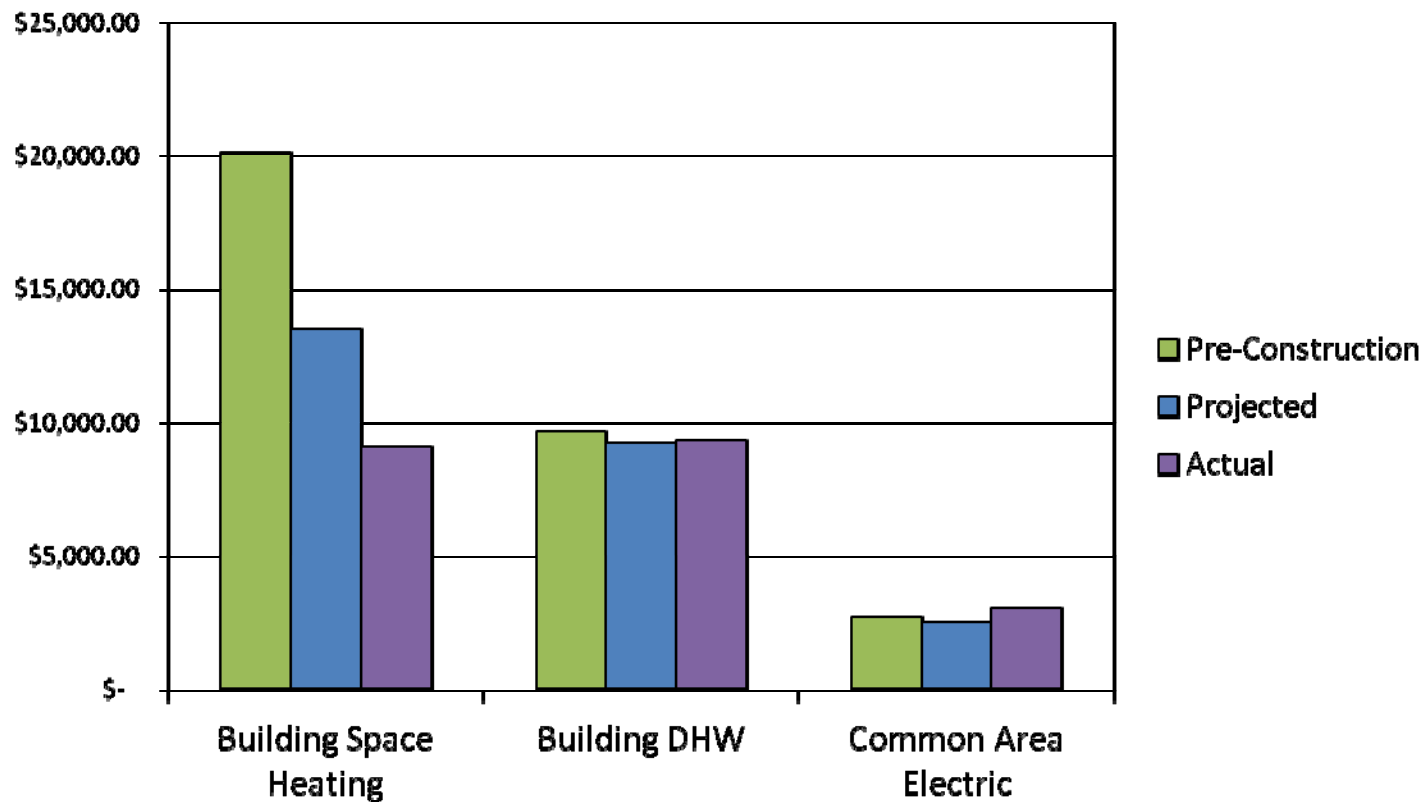






## 1. 19-unit pre-war

### Operating Cost Projections & Performance





1. 19-unit  
pre-war

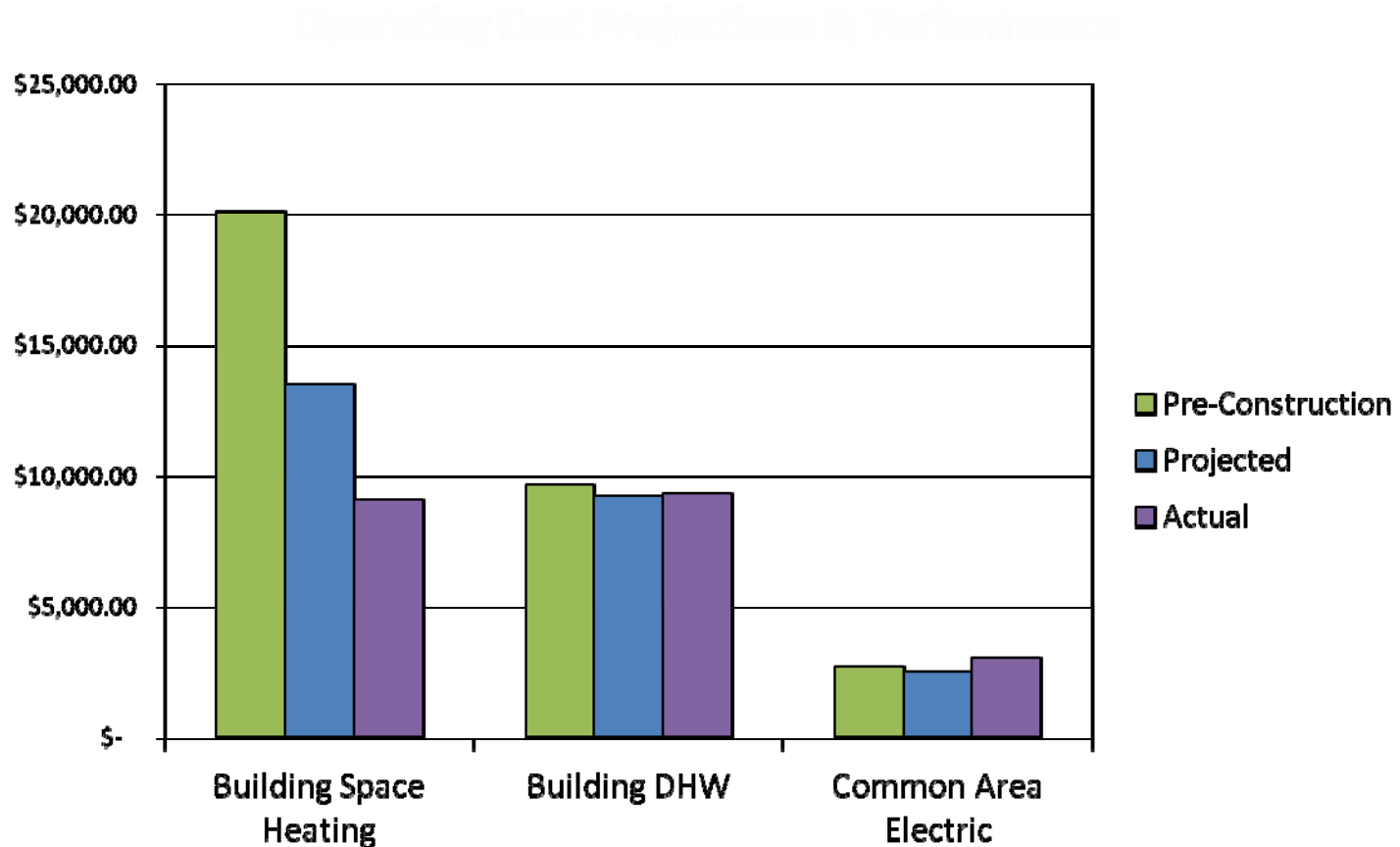
## Takeaways

1. In pre-war buildings, vast majority of an owner's operating costs are due to **fuel (not electricity)**
2. When atmospheric boilers are replaced, fuel savings tend to be **under-predicted** (due to conventional modeling protocols)



## 1. 19-unit pre-war

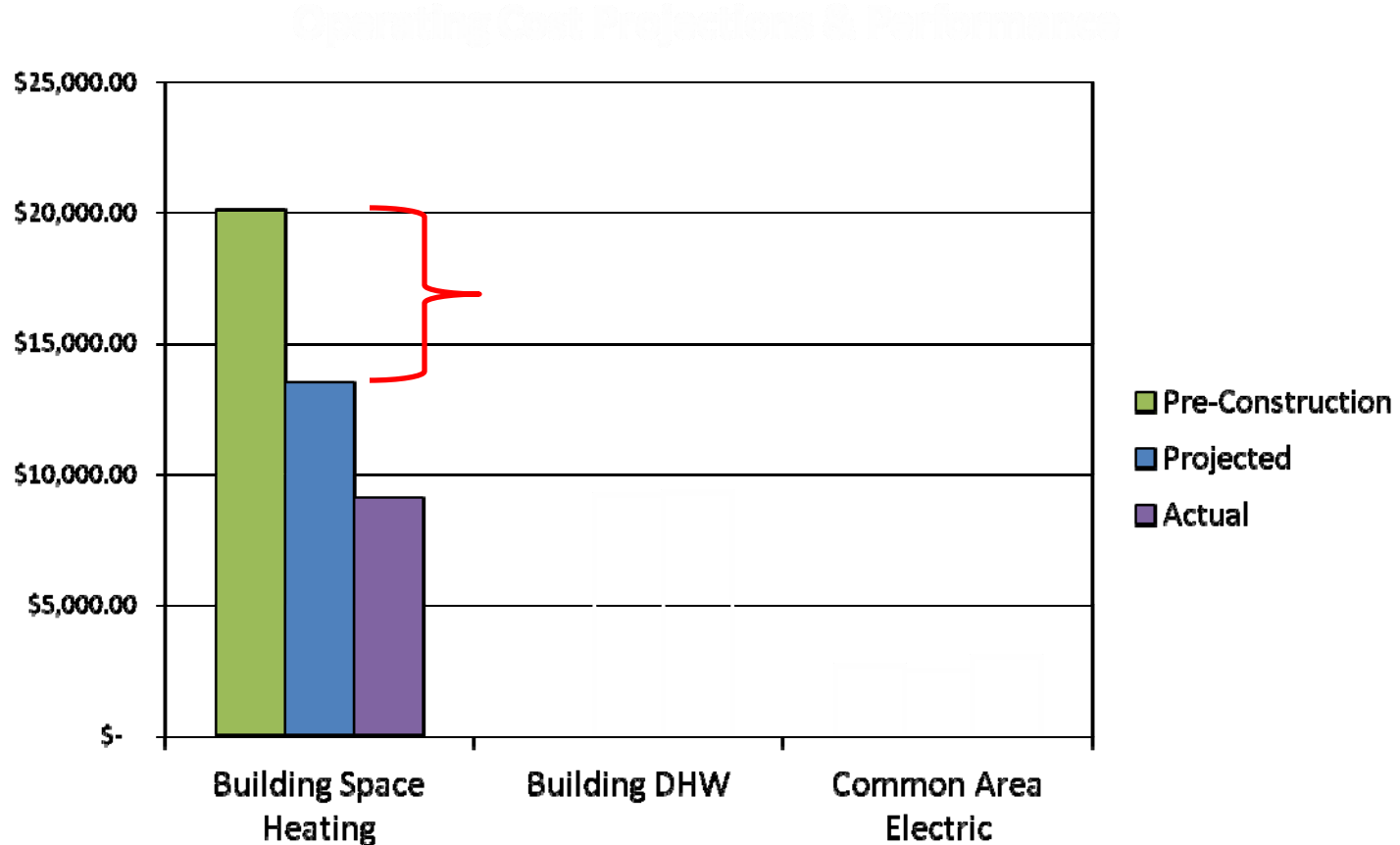
*What if we underwrote against the projected heating savings?*





## 1. 19-unit pre-war

*What if we underwrote against the projected heating savings?*





1. 19-unit  
pre-war

*What if we underwrote against the projected heating savings?*

*Annual space heating expenses*

Before	\$ 20,100
<u>After (projected)</u>	<u>\$ 13,500</u>
Projected savings	\$ 6,600 (33%)



**1. 19-unit  
pre-war**

*What if we underwrote against the projected heating savings?*

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Before	\$ 20,100
After (projected)	\$ 13,500
Projected savings	\$ 6,600 (33%)

*Debt supported via savings*

Debt service coverage ratio	1.30
Annual debt service	\$ 5,100
Loan (7%, 30 years)	\$ 63,800



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*Debt supported via savings*

Debt service coverage ratio	1.30
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Loan (7%, 30 years)	\$ 63,800

**➔ Total retrofit cost: \$ 84,200** **76% supported**

## Case Study #2: 102-unit modern

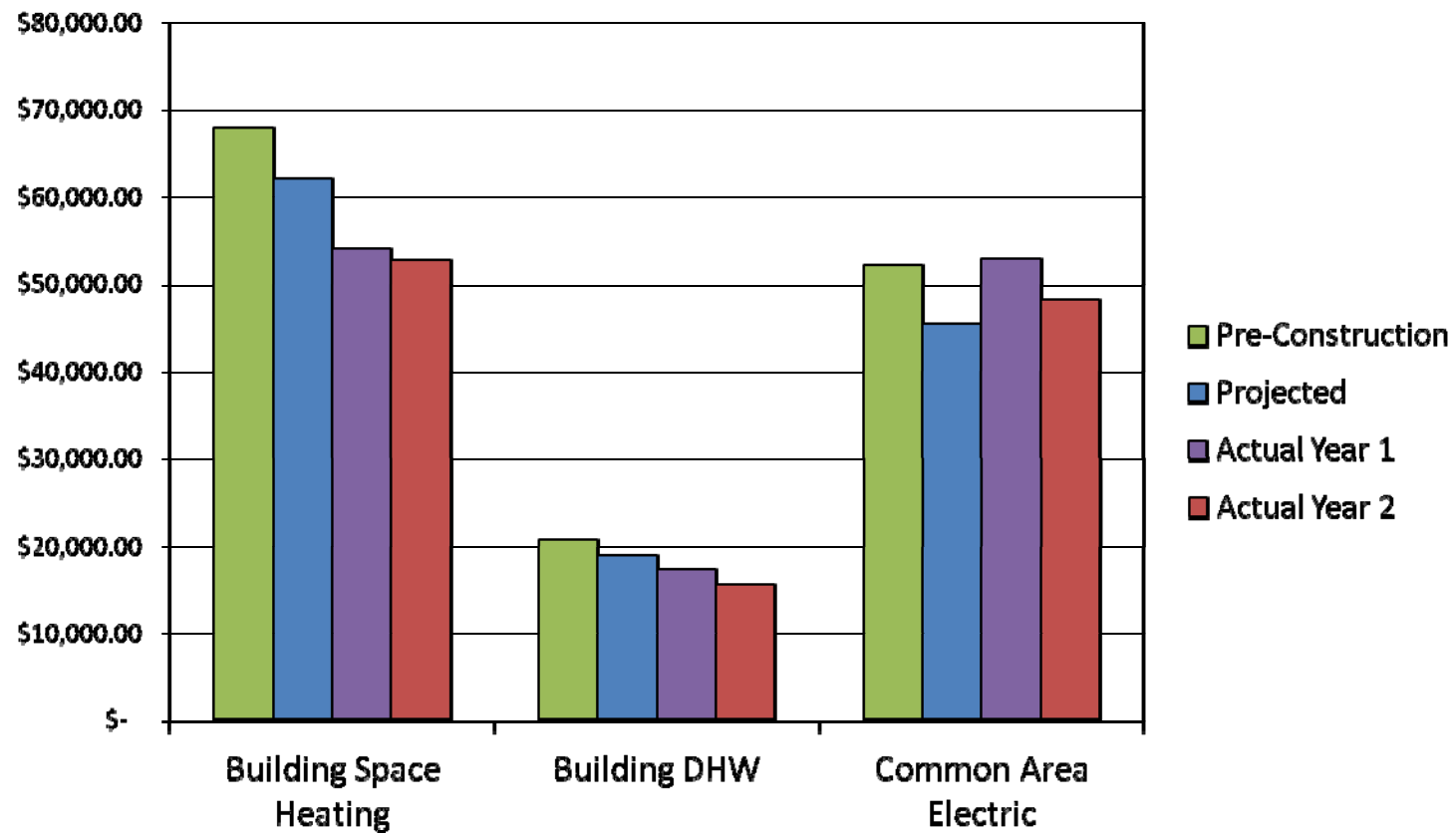






## 2. 102-unit modern

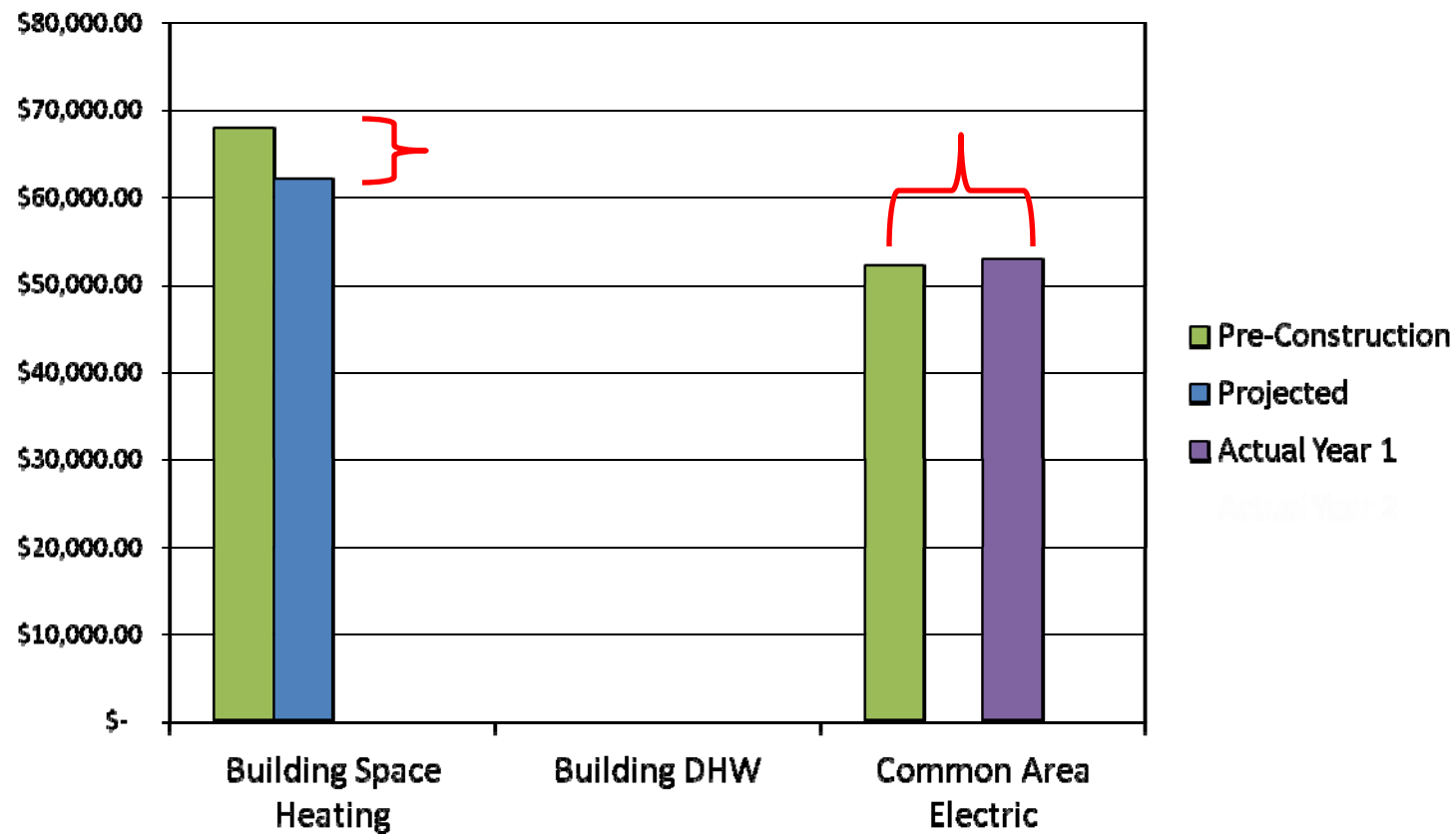
### Operating Cost Projections & Performance





## 2. 102-unit modern

*What is the risk associated with the underperformance of electric savings projections?*





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### *Project stats*

Total retrofit cost	\$224,000
Projected savings	11%



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*What is the risk associated with the underperformance of electric savings projections?*

### *Project stats*

Total retrofit cost	\$224,000
Projected savings	11%

### *Debt supported via projected savings*

Annual savings	\$ 14,300
Loan (7%, 30 years)	\$ 137,900



## 2. 102-unit modern

*What is the risk associated with the underperformance of electric savings projections?*

### *Project stats*

Total retrofit cost	\$224,000
Projected savings	11%

### *Debt supported via projected savings*

Annual savings	\$ 14,300
Loan (7%, 30 years)	\$ 137,900

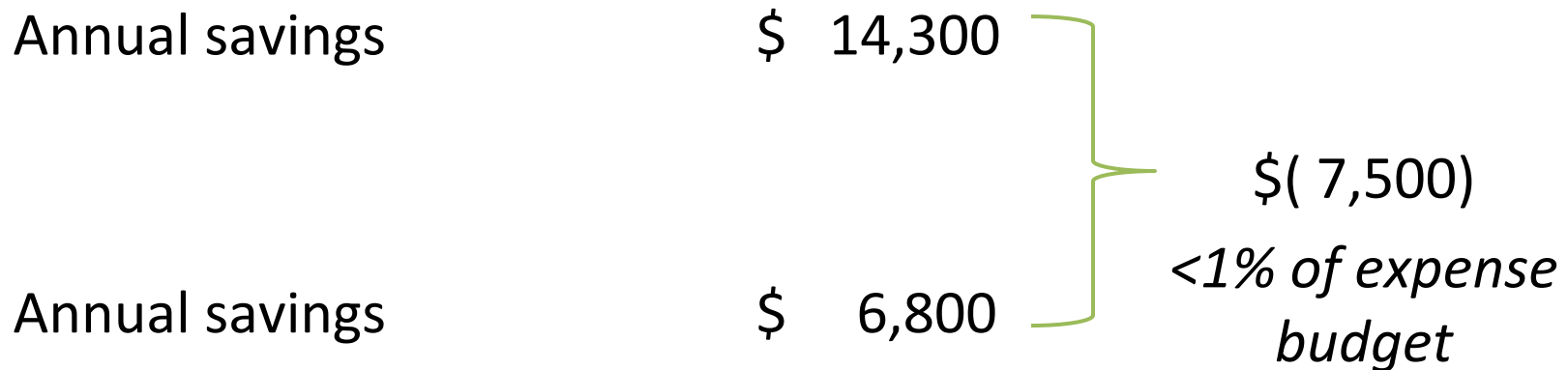
### *...with underperformance of electric*

Annual savings	\$ 6,800
Loan (7%, 30 years)	\$ 65,600



## 2. 102-unit modern

*What is the risk associated with the underperformance of electric savings projections?*



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# Opportunities & recommendations

## 1. Improved Access to Data

- DB/LC dataset: *current performance & projection accuracy*
- NYC's Greener, Greater Buildings Plan



# Opportunities & recommendations

## 1. Improved Access to Data

## 2. Potential Underwriting Modifications

- Incorporate practice into first mortgage
- Allow second mortgage for capital improvements
- Hold loan increase in escrow until savings realized
- Create mini-permanent loan product

# Opportunities & recommendations

1. Improved Access to Data

2. Potential Underwriting Modifications

3. Structural and Regulatory Changes

- Require higher performance
- Public sector should take on initial risks of incorporating savings projections
- Market demand for “green” features will eventually drive appraisals

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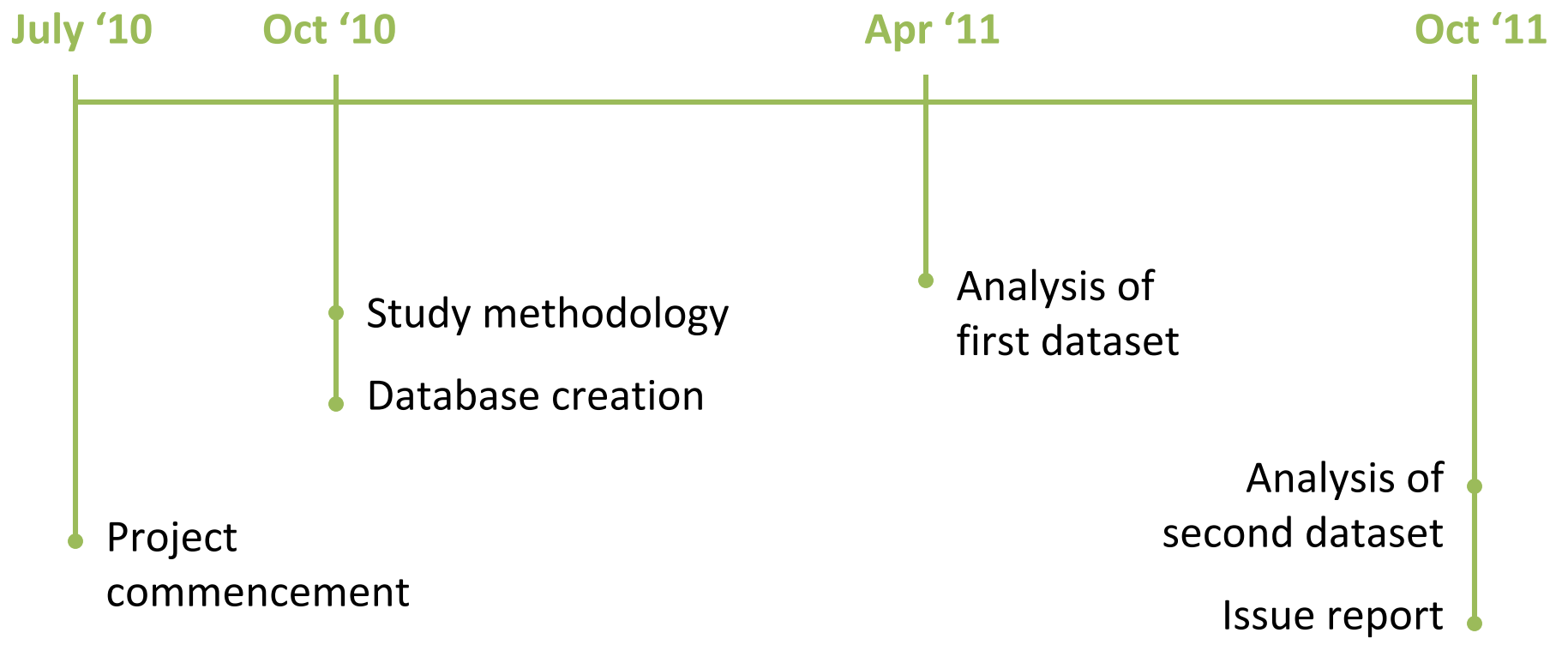
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# Contact

**Cary Hirschstein**

HR&A Advisors, Inc.

212.977.2704

[cary@hraadvisors.com](mailto:cary@hraadvisors.com)