



NEW YORK  
STATE OF  
OPPORTUNITY.

RetrofitNY

# RetrofitNY Design Workshop

*Revolutionizing Building Renovations in New York State*

*11.02.17*

# Agenda

- 10:00 – 10:10am **Welcome & Session Overview**
- 10:10 – 10:20am **RetrofitNY Introduction**
- 10:20 – 11:10am **Guest Speakers and Q&A Panel**
- 11:10 – 11:50am **RFP Overview + Participation**
- 11:50 – 12:10pm **Break + Working Lunch**
- 12:10 – 12:55pm **Cross-Cutting Team Networking Exercise**
- 12:55 – 1:00pm **Closing/Next Steps**
- 1:00 – 2:00pm **Informal Networking**

# What is RetrofitNY?

# Creating a large scale, self-sustaining market for high performance retrofit solutions

Industry-designed, cost-effective retrofit solutions for tenanted buildings reaching or approaching net-zero energy.

Implement solutions on a large scale to drive industrialization and reduce costs.



# Net-Zero Energy Retrofits... or close to it

## Benefits

- Residents
  - Health & Comfort
  - Quality of Life
- Building Owners
- City & State
  - Environmental Impact
  - Affordable Housing Preservation
- \$1+ Billion Annual Market



Woodrow Wilson Apartments  
Amsterdam, NY  
Circa 2014



Woodrow Wilson Apartments  
Amsterdam, NY  
Circa 2016

Courtesy: Beacon Communities, LLC



Netherlands



United Kingdom



Germany



France



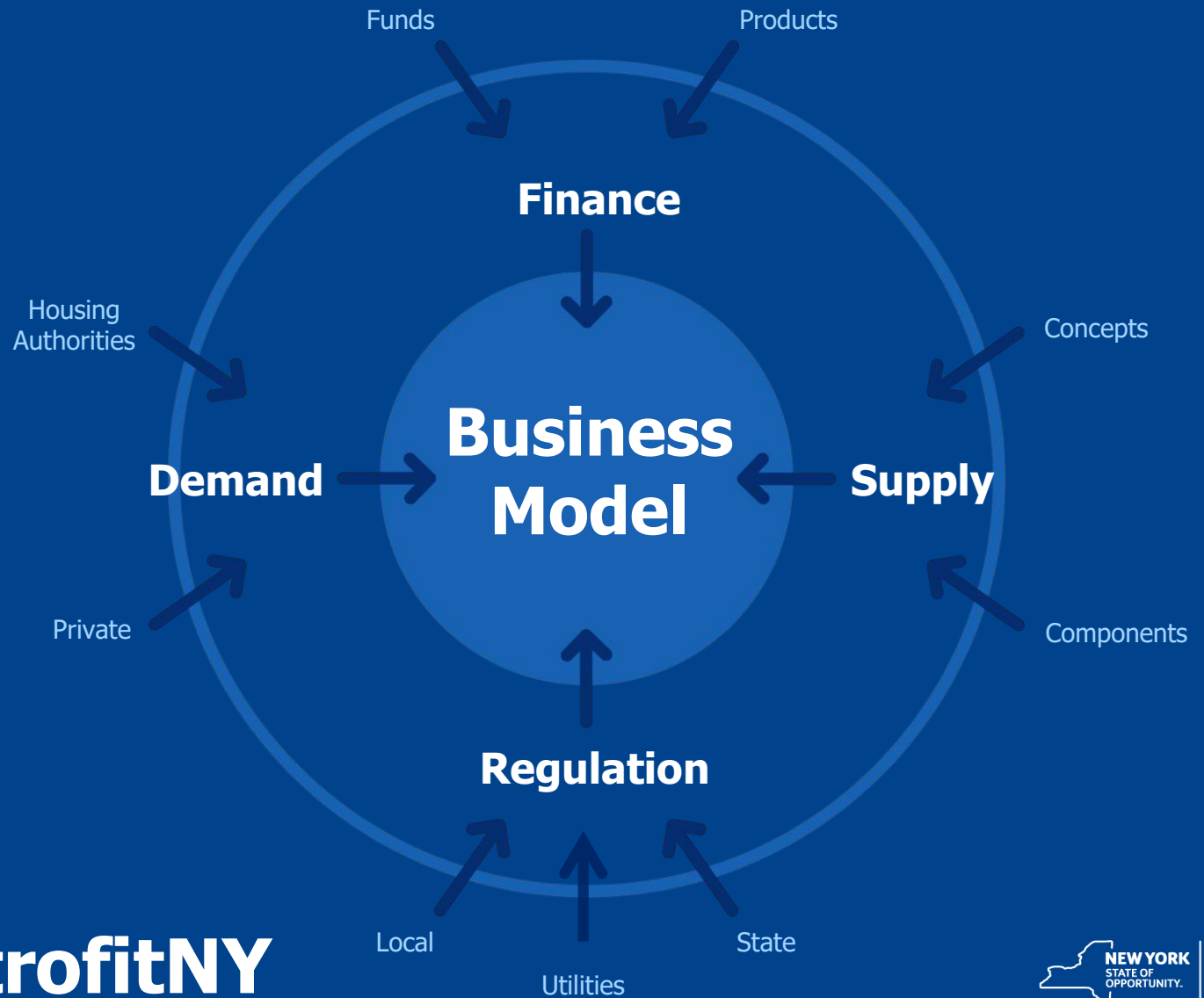
New York



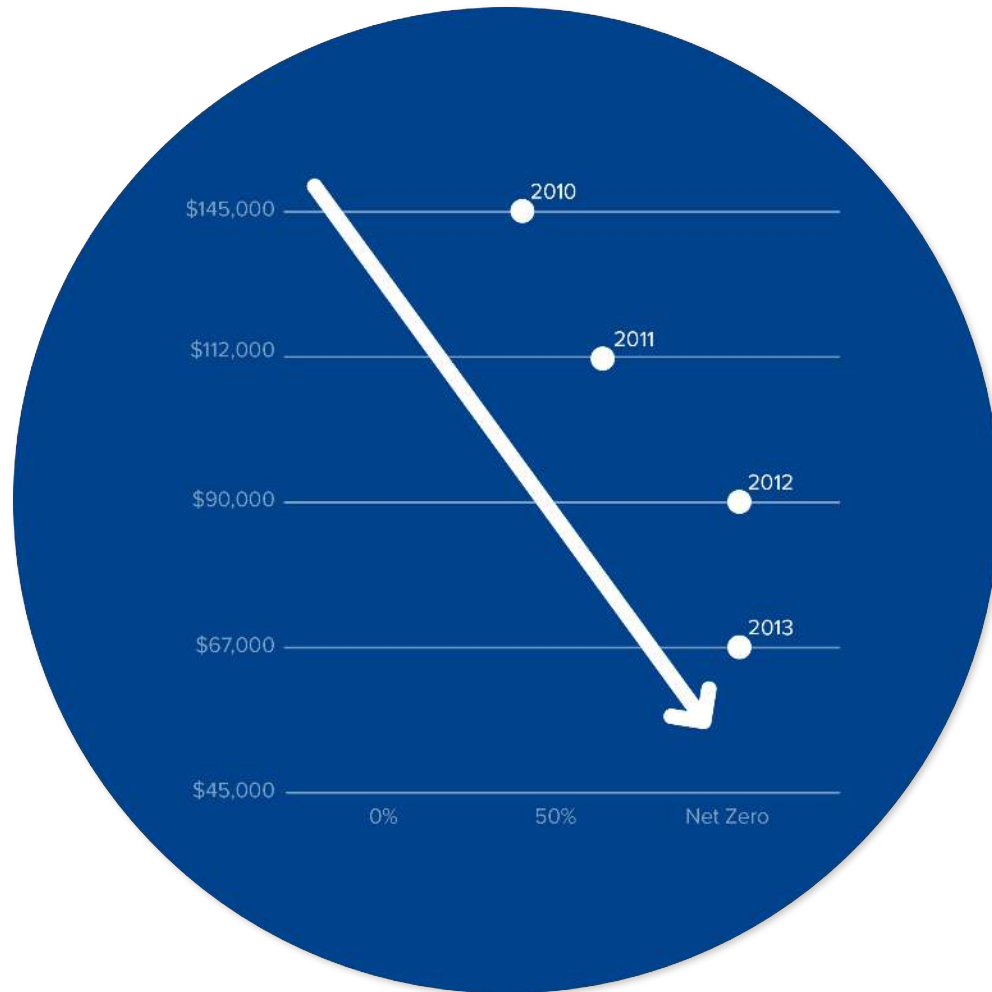
RetrofitNY



Revolutionizing the way multifamily buildings are renovated, keeping residents in their homes.



[Nyserda.ny.gov/RetrofitNY](https://www.nysed.gov/RetrofitNY)



A successful model to show market potential

# Cost per Unit & Performance of Retrofits

By reaching scale, this solution will become the standard.

This is where the market is headed, and you can be ahead of the curve.

# Guest Speaker Presentations and Q&A



## Sadie McKeown

Executive Vice President & COO,  
Community Preservation Corporation

# About CPC

The Community Preservation Corporation (CPC) believes housing is central to transforming underserved neighborhoods into thriving, vibrant communities.

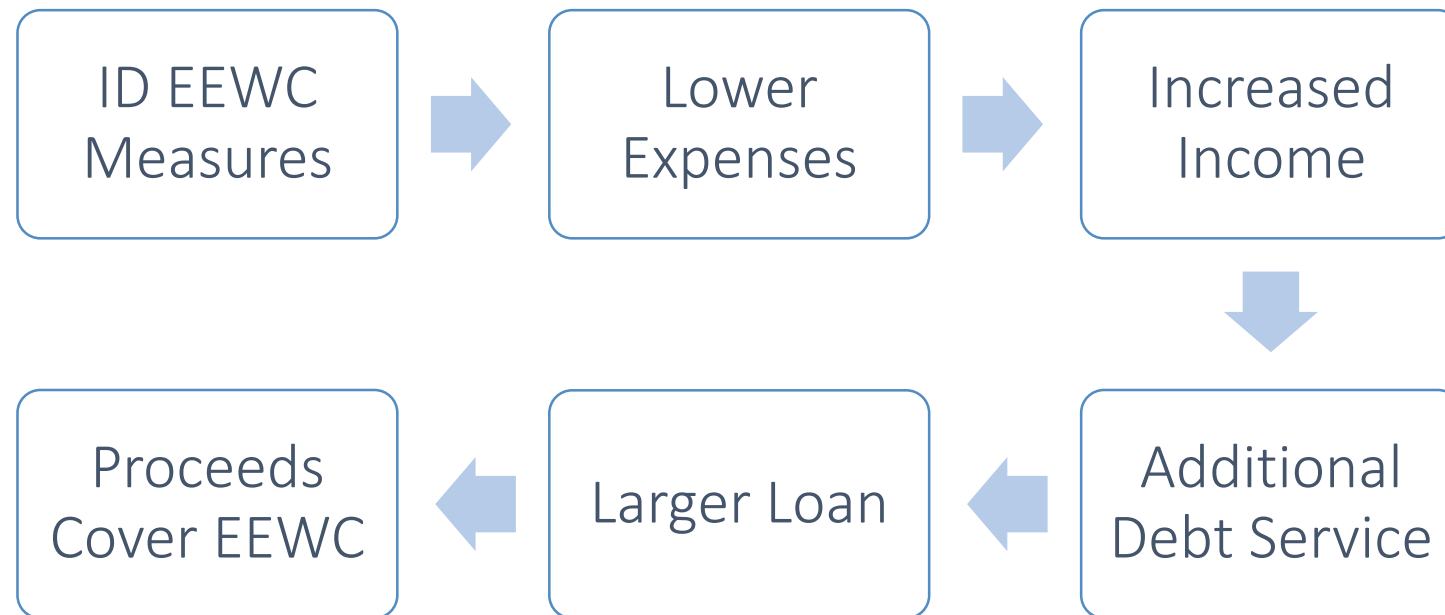


# About CPC

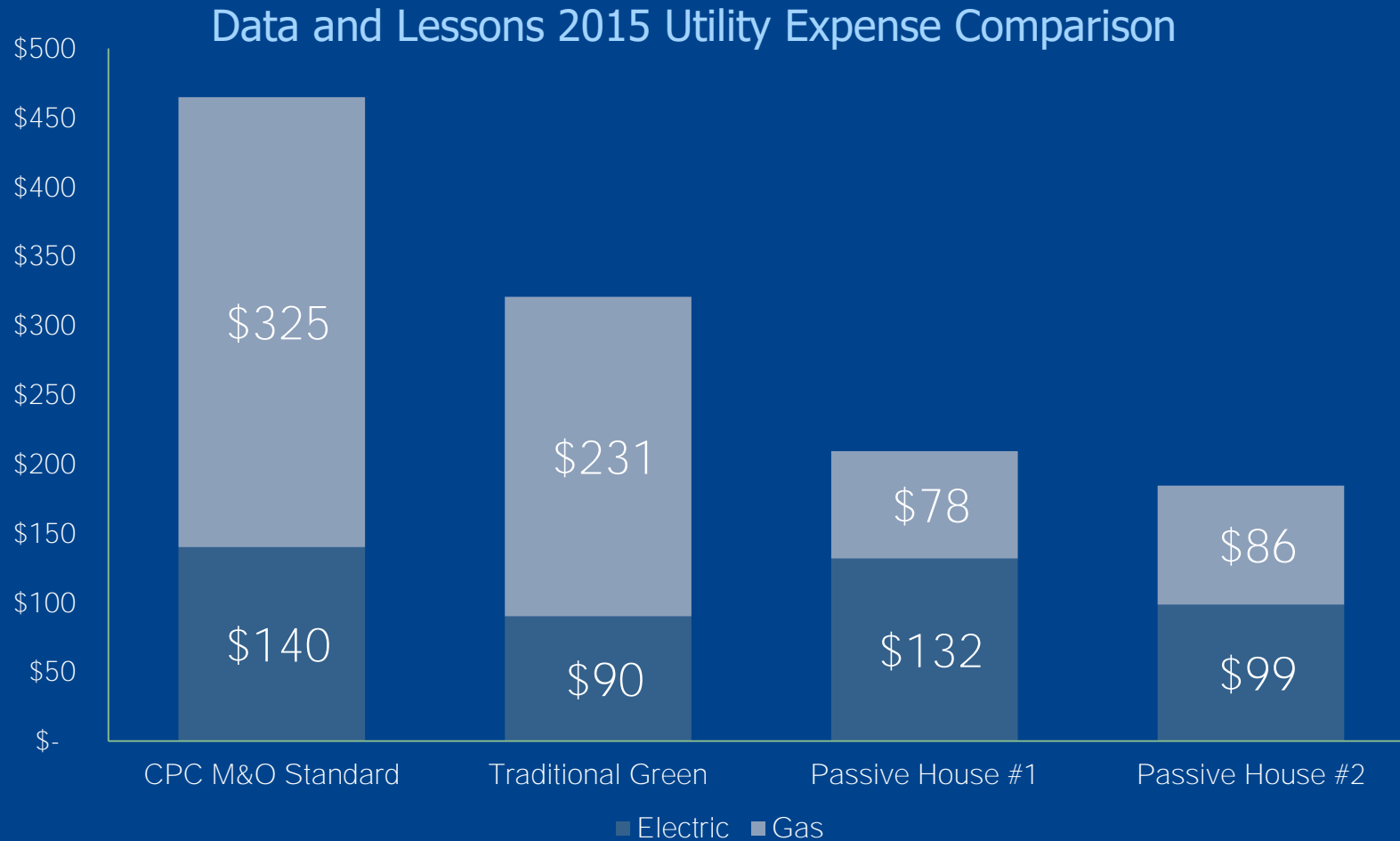
- CPC is a nonprofit affordable housing and community revitalization finance company providing flexible capital solutions, fresh thinking and a collaborative approach to the complex issues facing communities.
- Our goal is to be more than just a lender. At CPC, we work as a partner to provide technical expertise, support and flexible solutions that help meet the capital needs and broader community revitalization goals of our customers, local stakeholders and the communities we serve.

# CPC Approach

CPC's financing methodology integrates energy efficiency and water conservation (EEWC) measures into a traditional multifamily mortgage.



# High Performance & Operation Savings

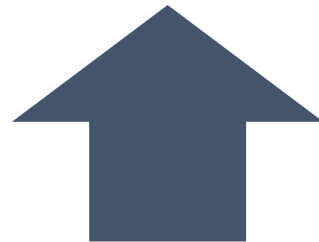




# Monetizing the Benefits



Investing in energy efficiency and renewables reduces utility bills and operating expenses.



When expenses decrease, net operating income (NOI) will increase. A higher NOI means a building can support additional private debt.



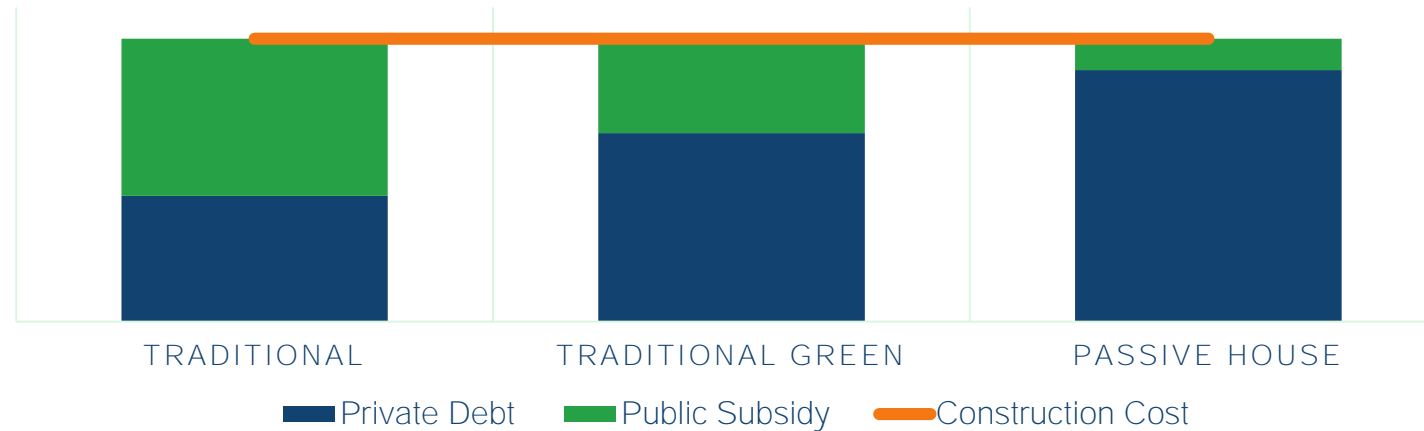
When mortgage lenders monetize energy savings, borrowers can utilize low-cost, long-term capital to finance energy investments.

# Monetizing the Benefits



Monetizing projected energy savings allow a building to support additional private debt. Now, loan proceeds can be used to fund deeper retrofits and larger energy investments.

# Monetizing the Benefits



In affordable housing, if construction costs remain the same, additional debt can be used to offset the need for public subsidy.

# Case Study

## Passive House

**123 1<sup>st</sup> ST**  
24 Units  
24,000 sq ft



# Case Study

## Underwriting Passive House – Nassau County

### Income & Expense Schedule 123 1st St

Units 24  
Rooms 64

	CPC Standard (NYC)	Passive House/ RetrofitNY		
<b>Income</b>				
Effective Gross Income	453,374	453,374	-	-
<b>Expenses</b>				
Water & Sewer	16,000	13,000	↓	18.8%
Heat	19,200	10,560	↓	45.0%
Gas & Electric	10,880	6,790	↓	37.6%
Other Expenses	105,779	105,779		
NOI	301,515	317,245		
CPC Loan Amount	3,640,143	3,830,049	↑	5.2%
Subsidized Loan Amount	2,536,297	2,346,391	↓	7.5%
<b>Additional Proceeds:</b>	<b>189,906</b>	<b>Per Unit:</b>	<b>7,913</b>	

Projected Expenses Energy Model	Projected Savings Energy Model	Adjustment (%)
-	-	-
10,000	6,000	50.0%
1,920	17,280	50.0%
2,700	8,180	50.0%

# Recommendations

- Start a conversation
- Listen, process, roll up your sleeves
- Underwriting to savings
- Strong partnerships & collaboration
- Be creative



## Scott Short

Chief Executive Officer,  
RiseBoro Community Partnership

# Opportunities through the RFP

- Embracing innovative solutions to improve the quality of life and comfort of residents
- Enabling minimal disruption to residents, as they can remain in the building during retrofits
- Decreasing operating costs in affordable housing
- Reducing the carbon footprint of affordable housing



# RiseBoro Passive House Developments

In Operation



Mennonite United  
Revival Apartments



Knickerbocker  
Commons

# RiseBoro Passive House Developments

**In Construction**

Our Lady of Lourdes  
Apartments



# RiseBoro Passive House Developments

In Predevelopment

Harry T. Nance  
Apartments

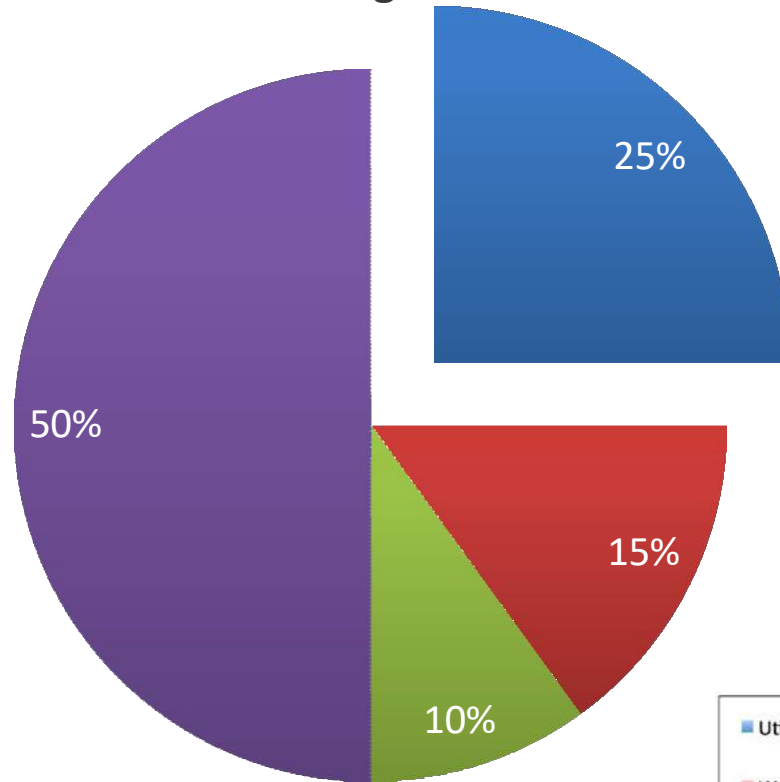


# Benefits of Passive House

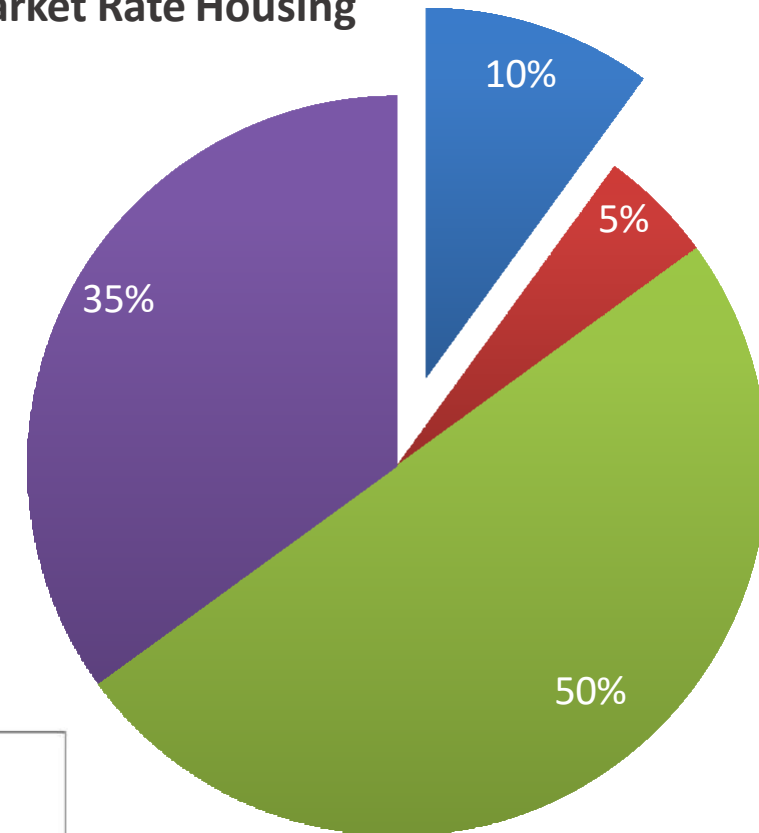
- Quality of Life
- Innovation
- Environmental
- Economic
- Health

## A Comparison of Typical Annual Maintenance & Operational Expenses

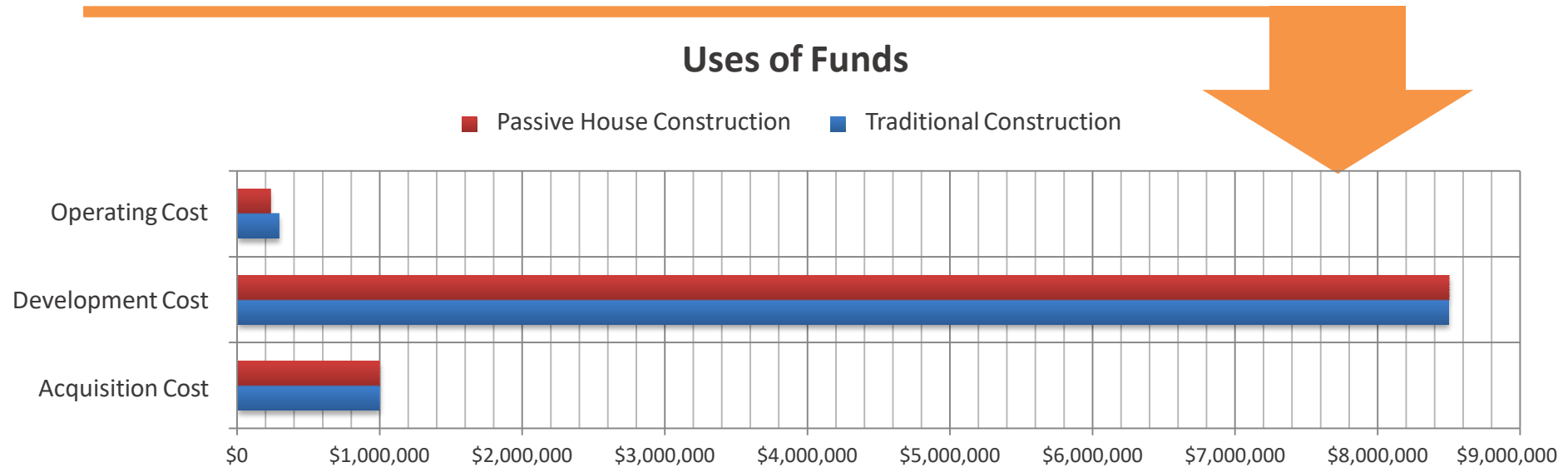
Affordable Housing



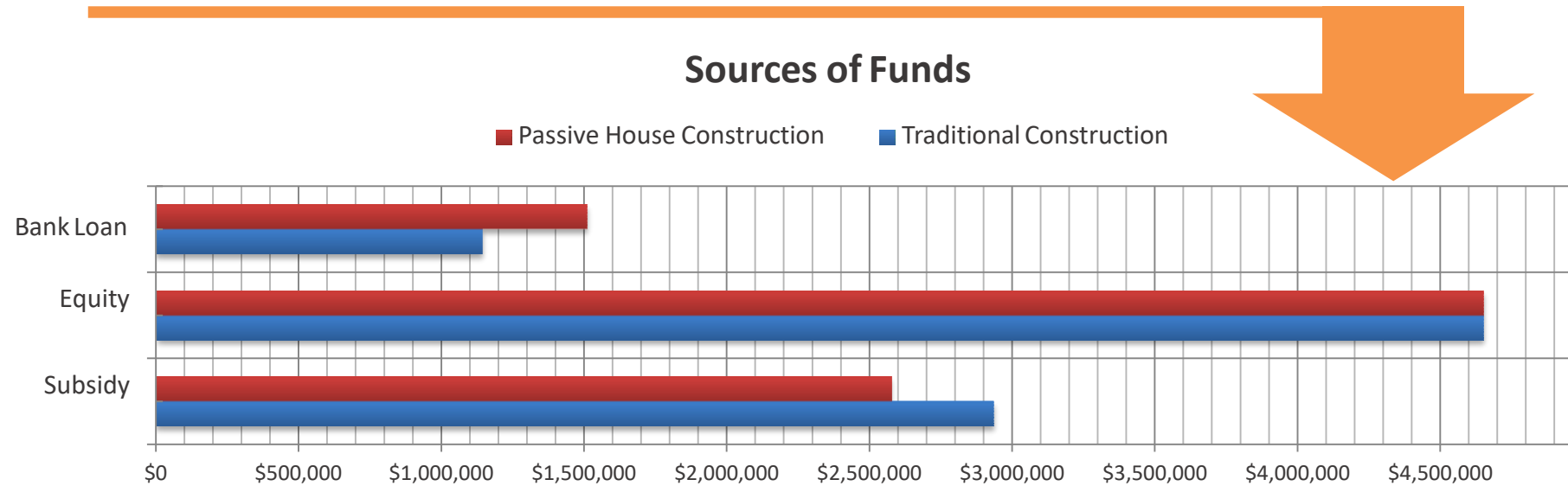
Market Rate Housing



# Impact on funding of 50% reduction in gas and electric costs...

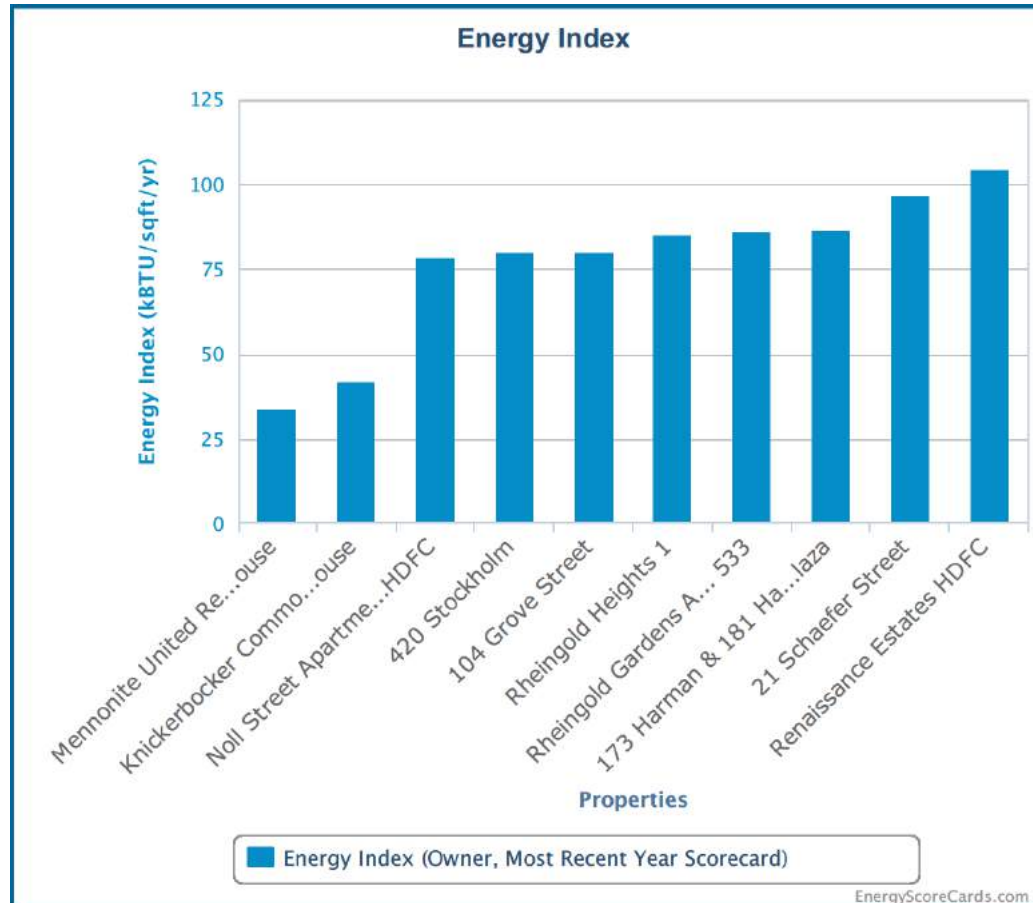


# Impact on funding of 50% reduction in gas and electric costs...



# How Are We Doing?





# Passive House – Performance

- July 2016 - July 2017 data
- All buildings hydronic heat
- All buildings less than 15 years old
- Passive House less than half of energy index

# What's Next?

# Passive House Retrofits



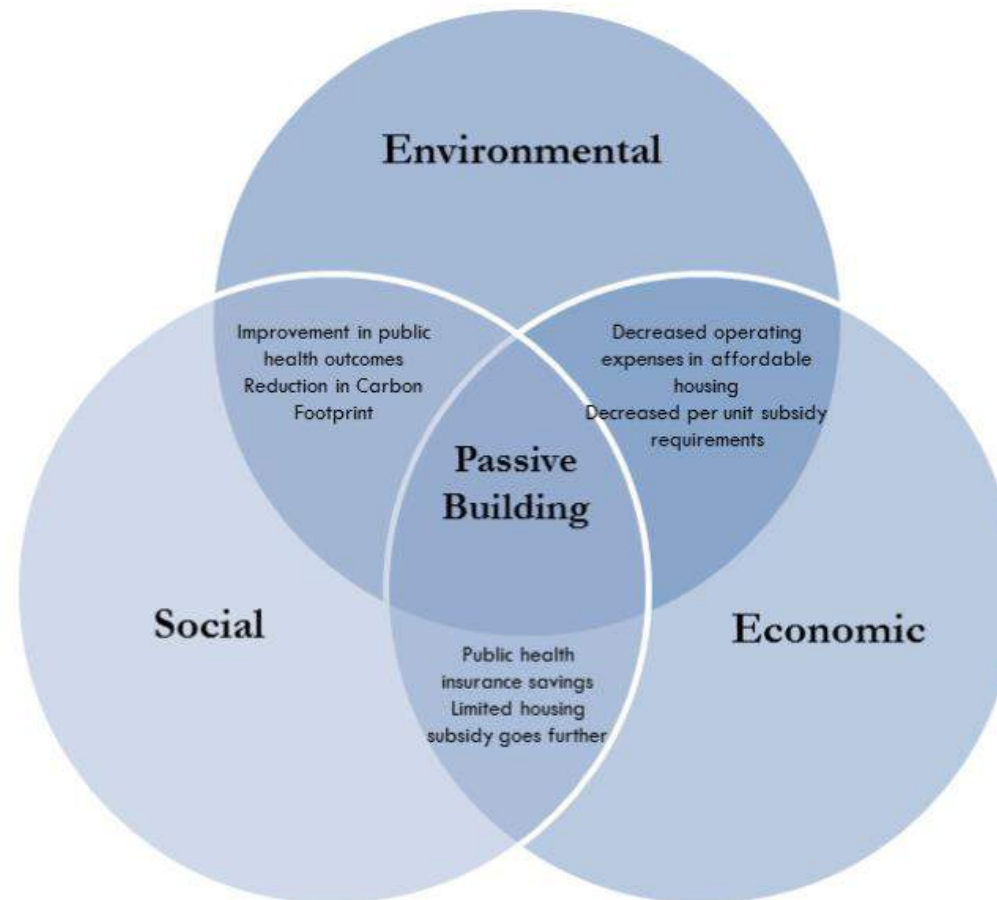
# Property Portfolio

<u>Building</u>	<u>Building Type</u>	<u>Current LL84</u>	<u>2018 LL84</u>	<u>Stories</u>	<u>Elevator</u>	<u>Total Units</u>	<u>1BD</u>	<u>2BD</u>	<u>3BD</u>
420 Stockholm	Masonry/wood joist		Y	4		35	16	18	
150 Linden	block/plank	Y	Y	5	Y	40	3	28	9
557 Knickerbocker	block/plank	Y	Y	6	Y	43		33	10
75 Linden Street	Masonry/wood joist			4		12	4	5	3
104 Grove	Masonry/wood joist		Y	4		23		17	6
110 Grove	Masonry/wood joist		Y	4		23		17	6
116 Grove	Masonry/wood joist		Y	4		16	2	14	
120 Grove	Masonry/wood joist		Y	4		16	2	14	
93-95 Stockholm	Masonry/wood joist			4		14	6	8	
160 Harman	block/ poured concrete			4		14		14	
173 Harm	block/ poured concrete			4		14		14	
181 Harman	block/ poured concrete			4		14		14	
				<b>Total</b>		<b>264</b>	<b>34</b>	<b>196</b>	<b>34</b>

# Project Highlights

- Typical YR15 Financing Methods
- Moderate Rehab/Tenant in Place
- Underwrite to Savings
- Gap financing by NYSERDA
- Meet Passive House (PHIUS) Standard
- Bonus: Renewables/Solar

# Triple Bottom Line of Deep Energy Retrofits





## Stas Zakrzewski

Principal,  
ZH Architects

# Opportunities through the RFP

- Creating unique, energy-efficient solutions for retrofits that pay for themselves over time
- Collaborating on a new, forward-looking way of doing business
- Providing an opportunity for architects to be at the forefront of innovation
- Offering a huge potential for retrofit solutions to be applied to a larger scale



# Stratford Road EnerPHit

Before

After



2014



2017

# Stratford Road EnerPHit

## Exterior Insulation



# Next Steps

## Multifamily Buildings



# Suitability

XS | S | M | L | XL



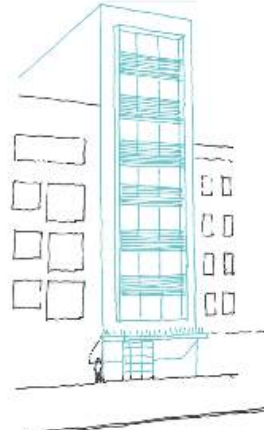
Ditmas Park  
3 Stories

Gut renovation



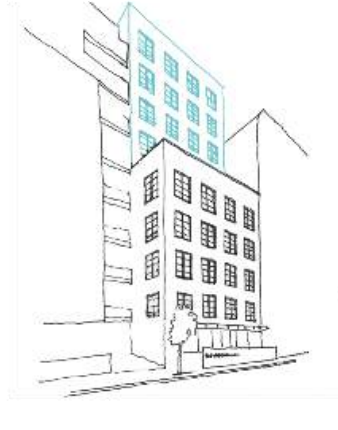
Brooklyn  
5 Stories

Gut renovation +  
addition



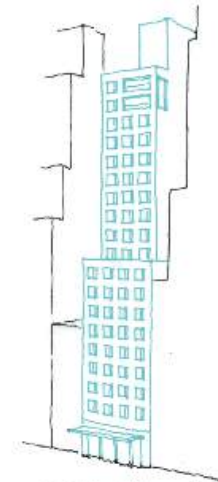
Lower East Side  
8 Stories

New Build



Tribeca  
10 Stories

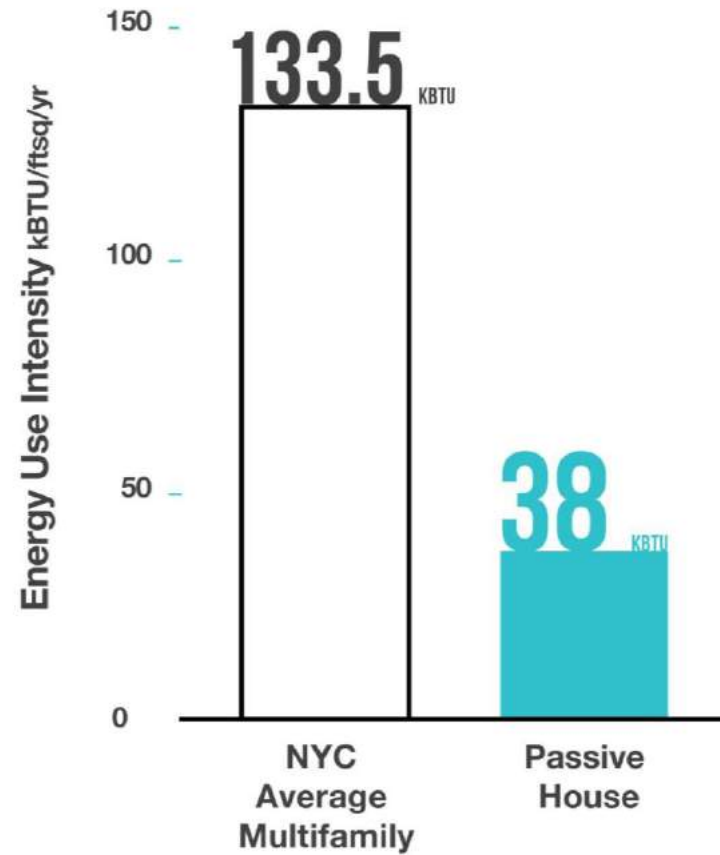
Gut renovation +  
extension



29th Street  
24 Stories

New Build

## Long Term Savings



Saldanha, Cheryl M., and Sean M. O'Brien. "A STUDY OF ENERGY USE IN NEW YORK CITY AND LEED-CERTIFIED BUILDINGS." *IBPSA-USA Journal* 6.1 (2016).



# Trends on Re-skinning

## Paris

- Aesthetics
- Gain Space
- Modernize



# Trends on Refurbishment

## London

- Opportunity to do better
- Re-clad with better performing material



# Trends on Re-skinning/Refurbishment

- Local law
- Reactive not proactive work
- Millions of dollars spent every year doing restoration work that does not improve energy efficiency
- This is an opportunity to do better and re-clad our buildings so our older building stock can meet energy code
- Let's do better!



# Over-cladding vs. Re-skinning

## Germany

- Leader in incorporating energy strategies
- Clever use of modern materials such as polycarbonate
- Rethinking building envelope to be both modern and sustainable



# ZH on Re-skinning

## Crown Heights, NY

- New addition and façade to an existing 3 story masonry is made energy efficient by factor 3X
- Opportunity to clean up the façade
- EnerPHit renovation possible in difficult site conditions

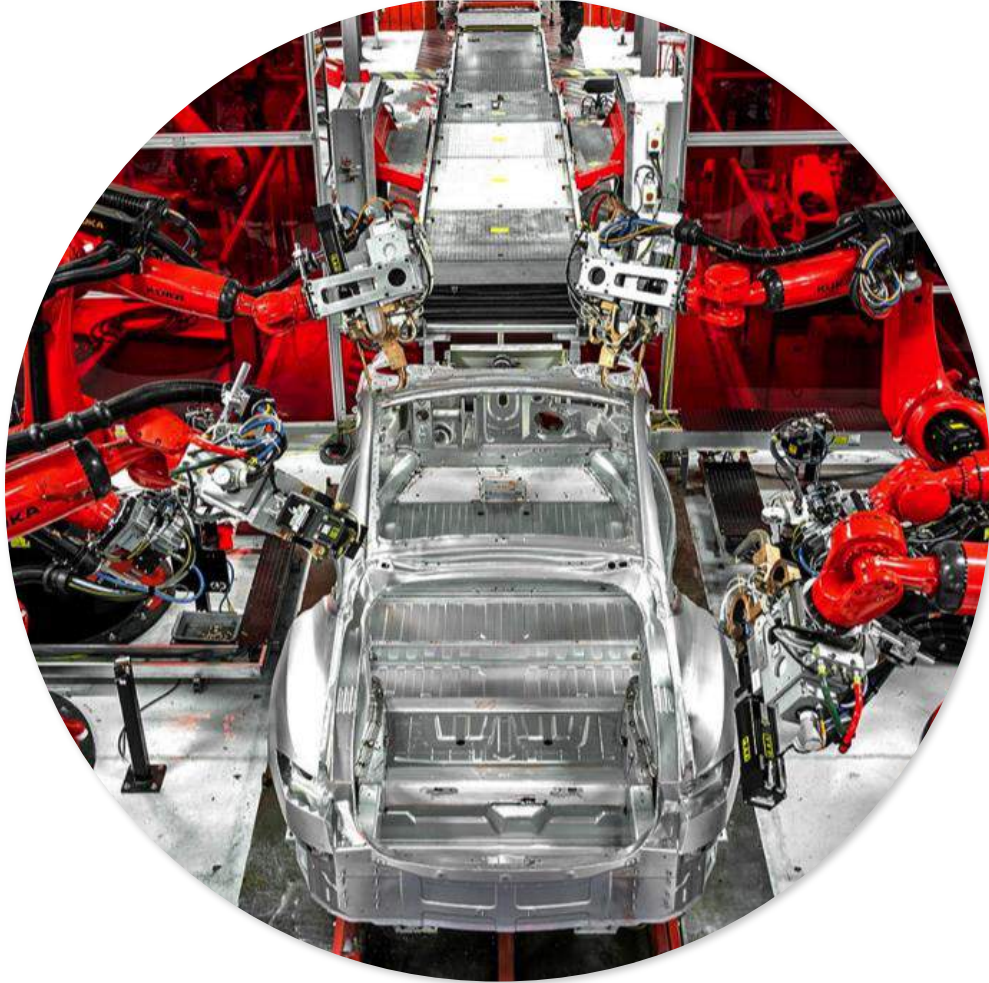


Existing Conditions



Front Elevation

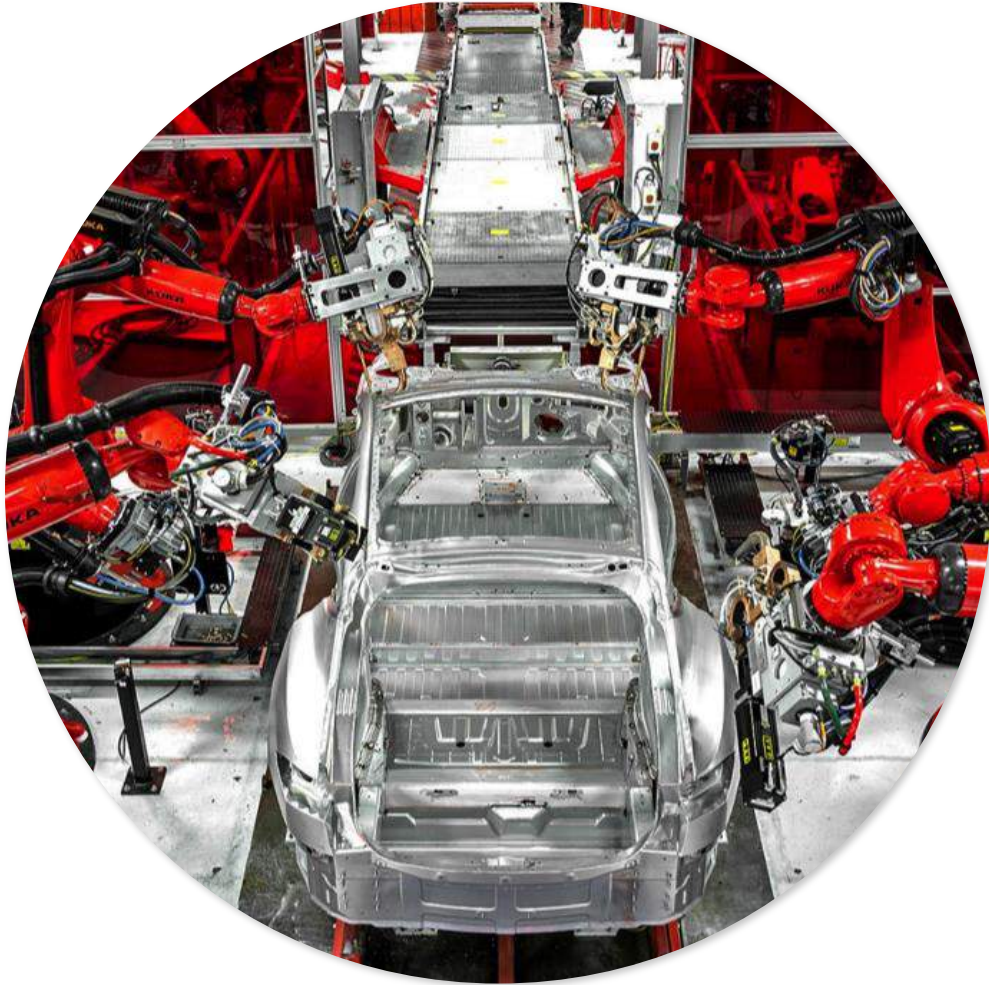
ZHA: Transforming Existing Stock



## New approach to design process – automation, pre-fabrication

### Fears

- Creativity will be lost
- Buildings will look similar



# New approach to design process – automation, pre-fabrication

## Reality

- Architects are innovative and imaginative
- The architectural process now engages the design from a different perspective and scale
- It's time to catch up – many construction methods have not changed in years, despite new materials, technologies, and environmental challenges



# Forward Thinking

## New York State

- We can be the ones that lead this initiative and recognize the design opportunity we have, layering energy efficiency to an already burgeoning market
- Begin with the components and build up
- Integrate ventilation
- Problem solve with mock-ups
- End up with a major reduction in future operating costs, thereby funding the renovation



## Paul Bertram

President,  
PRB Connect

# Opportunities through the RFP

- Building scalable and replicable high performance, deep energy retrofit solutions
- Mobilizing cross-functional teams to form these solutions through a collaborative design process
- Enabling social benefits, as tenants can remain in the building during retrofits
- Creating resilience in New York's building infrastructure

# Case Study

**Delivering a High Performance, Deep Energy, Resilient,  
Low Income, Multifamily Enclosure Retrofit in Castle Square, Boston**

Existing Façade  
**Zero Insulation**



New Façade  
**R-40**



# What went wrong?

- Commissioning was not done until a year after completion
- Enclosure commissioning was not done following ASTM E2813 – 12e1 Standard Practice for Building Enclosure Commissioning
- The goal 72% energy reduction was missed

# What went right?

- Castle Square was a collaborative effort that included the Tenants Association
- The exterior system was engineered with sound building science by bringing in an Enclosure Specialist
- Tenants could stay in units (with some disruption scheduling)
- Tenants saw about 50% reduction in energy bills (gas & electric)

# Right and Wrong

The modeled energy efficiency reduction goals were conceptually obtainable

# The Vision for Greater “Certainty” in Delivering System Performance



**Off-Site Construction,  
Panelized/Prefabricated  
Construction  
as part of the Deep Energy  
Exterior System Solution**

# RFP Overview

**We're looking for solutions  
that...**

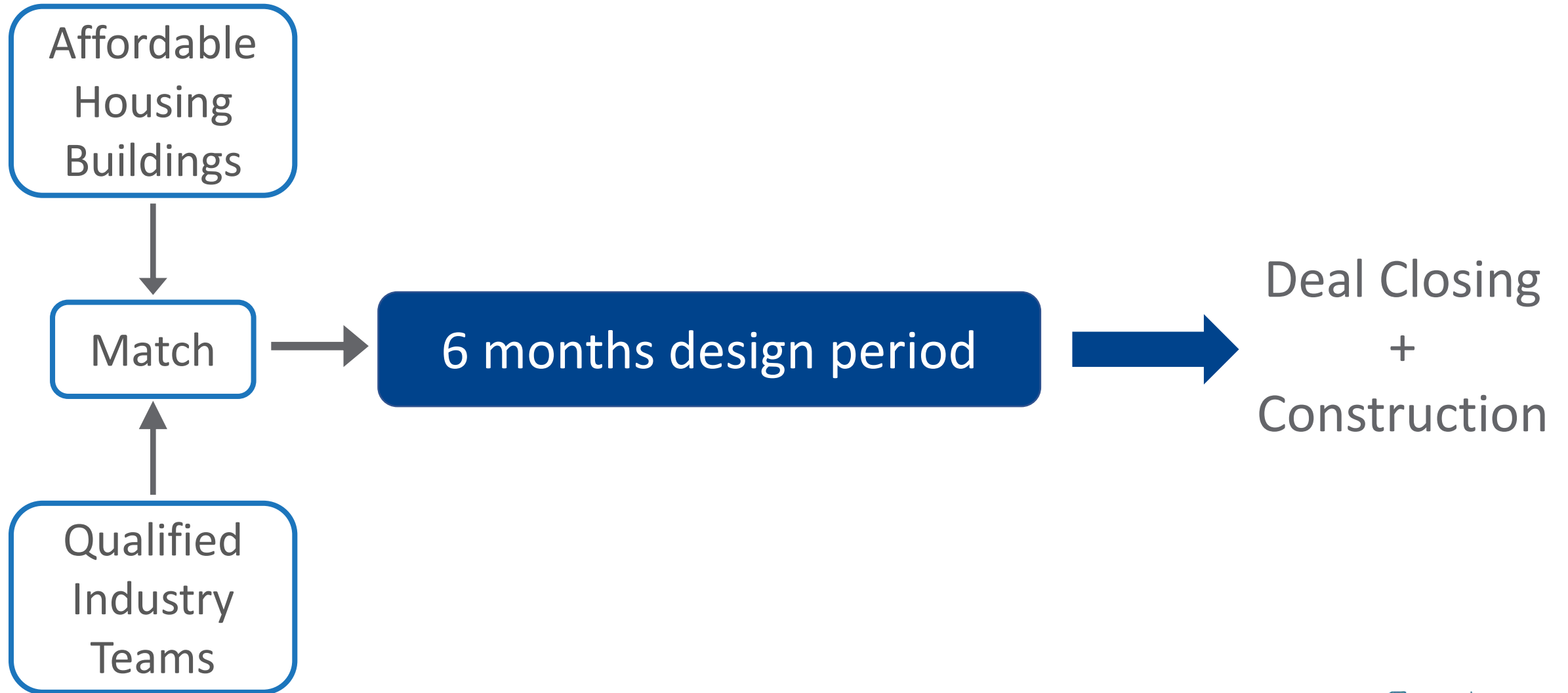
## Are designed to

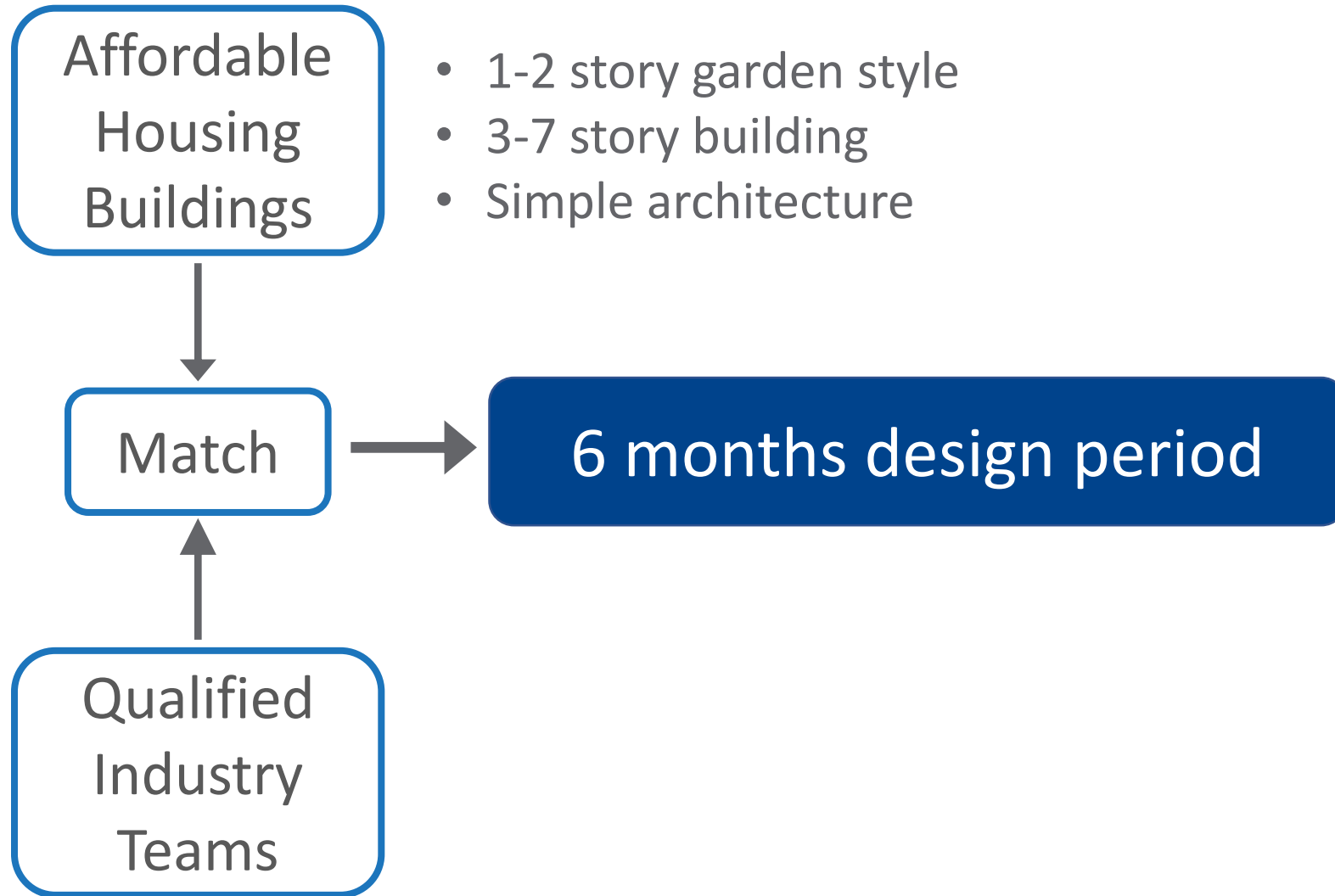
- Be cost-effective: planned rehab budget + savings
- Improve the appearance of the building
- Improve the quality of life for tenants
- Achieve or approach net-zero energy

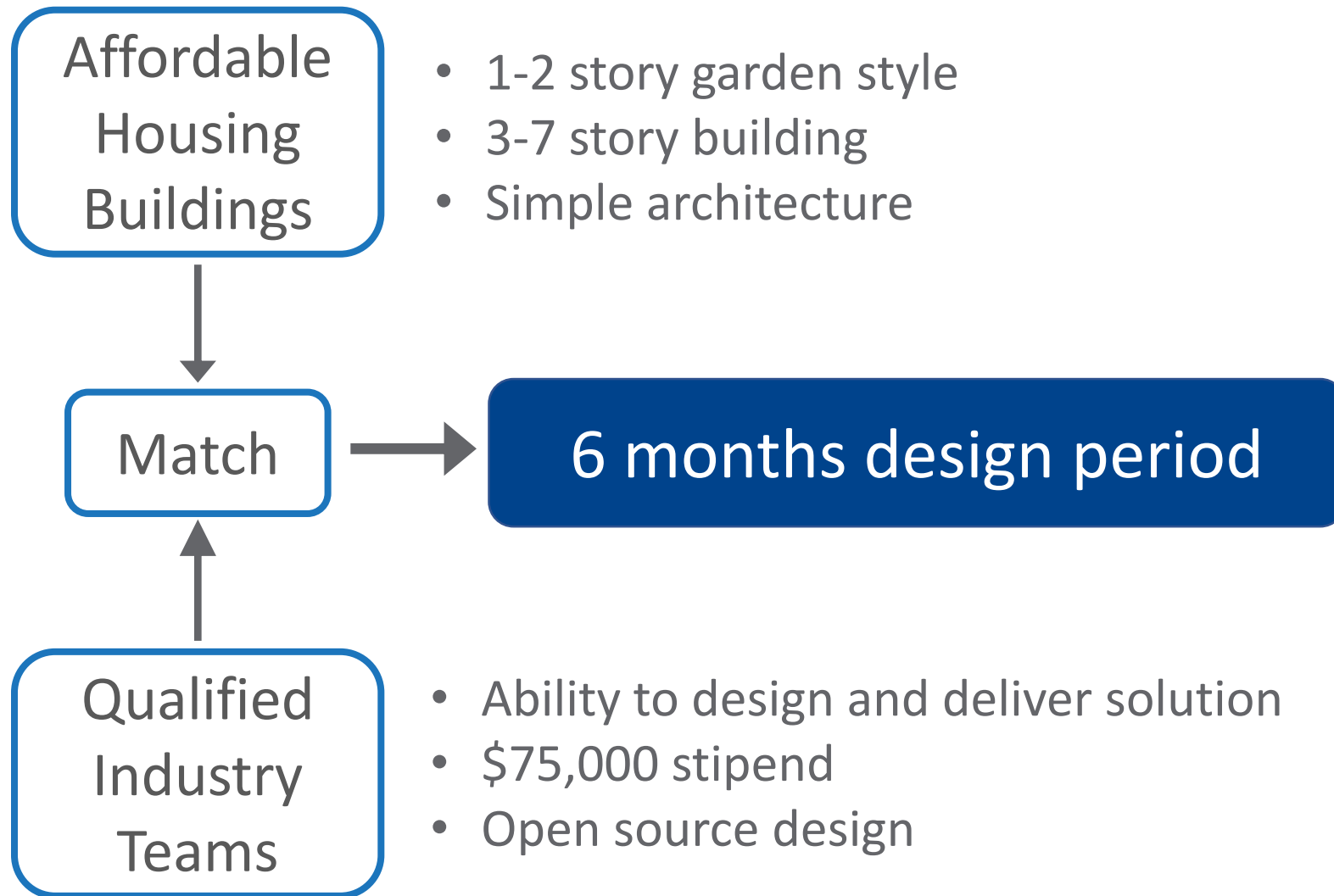


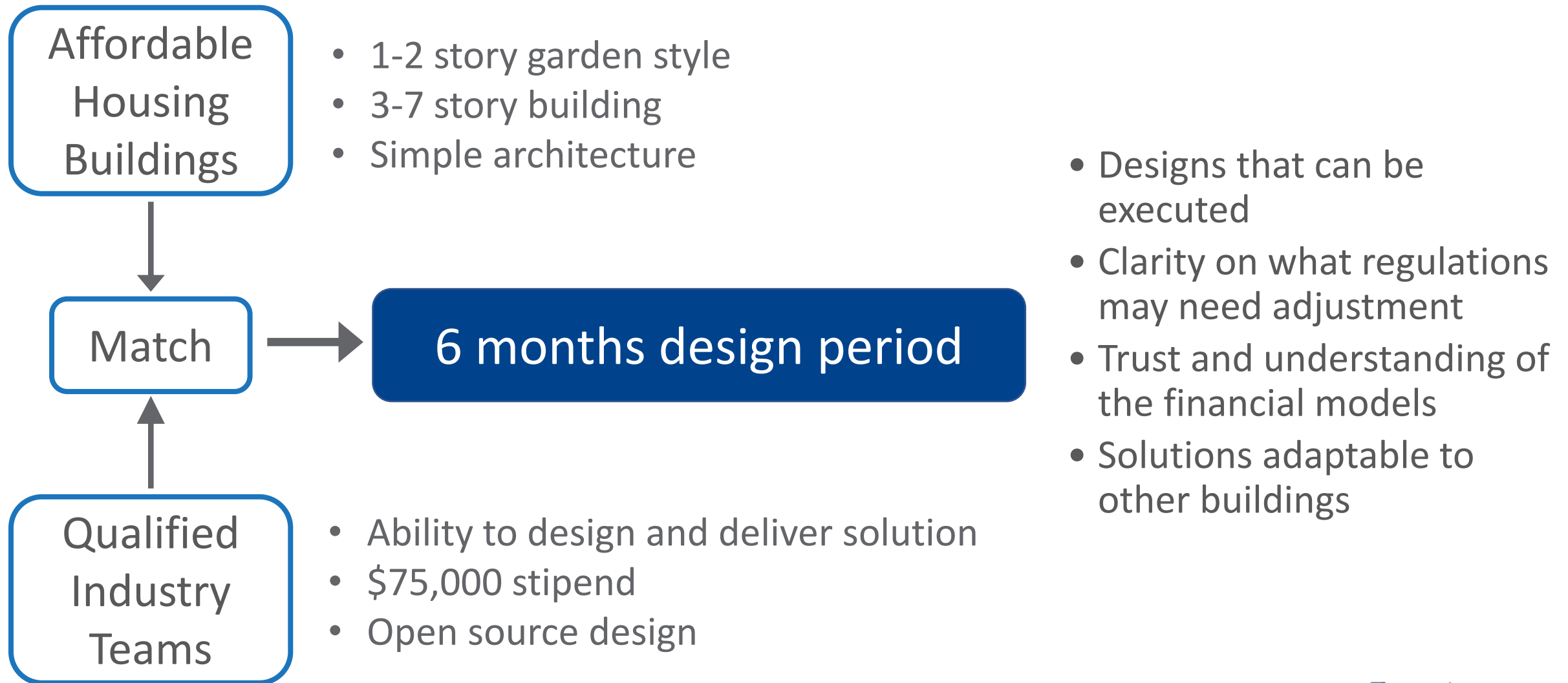
## Are delivered with

- Residents in place and limited disruption
- An energy performance guarantee over several decades









**6 months design period**



**Deal Closing  
+  
Construction**

### **Supporting the Teams**

- Transfer of knowledge from Energiesprong
- Coaches
- \$75,000 stipend

### **Making the Deal**

- Regular touch base
- HCR and HUD
- Financing partners
- Permitting agencies

**Gap Funding Available**

**Encourage collaboration between teams**

# RFP

## How to Participate

# What Buildings Are a Good Fit

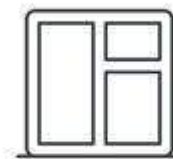
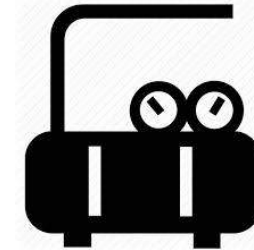
Regulated  
Affordable or  
Public  
Housing

One of the 2  
Target  
Typologies

Simple  
Architecture

Major  
Renovation  
Planned

Relatively  
High Energy  
Cost





# What Makes a Strong Team

- Capable of designing and building the solution
- Experience with high performance or net-zero projects
- Expertise in on-site generation
- Ability to model total cost of ownership
- Ability to project energy savings

# First Round Timeline

Q4 2017	Q1 2018	Q3/Q4 2018	End 2018 - 2019
<ul style="list-style-type: none"><li>• RFP Released</li></ul>	<ul style="list-style-type: none"><li>• 1<sup>st</sup> buildings and teams selected</li><li>• Design starts</li></ul>	<ul style="list-style-type: none"><li>• Solutions designed</li></ul>	<ul style="list-style-type: none"><li>• Construction starts</li><li>• Second round of pilots starts</li></ul>

Key players engagement → getting to a deal

RetrofitNY team works on financing and regulatory solutions

# Getting Ready to Participate

## Building Owners

- Select a building
- Connect with a team
- Identify building physical needs

## Potential Solution Providers

- Assemble a team
- Connect with a building owner

Be on the lookout for updates from the RetrofitNY team

[Nyserda.ny.gov/RetrofitNY](https://www.nysed.gov/RetrofitNY)

# Break

# Case Study

**Thank you**