

REALIZE

ROCKY MOUNTAIN INSTITUTE

Martha Campbell | September 30th, 2017



Transforming global energy use to create a clean, prosperous, and secure low-carbon future.

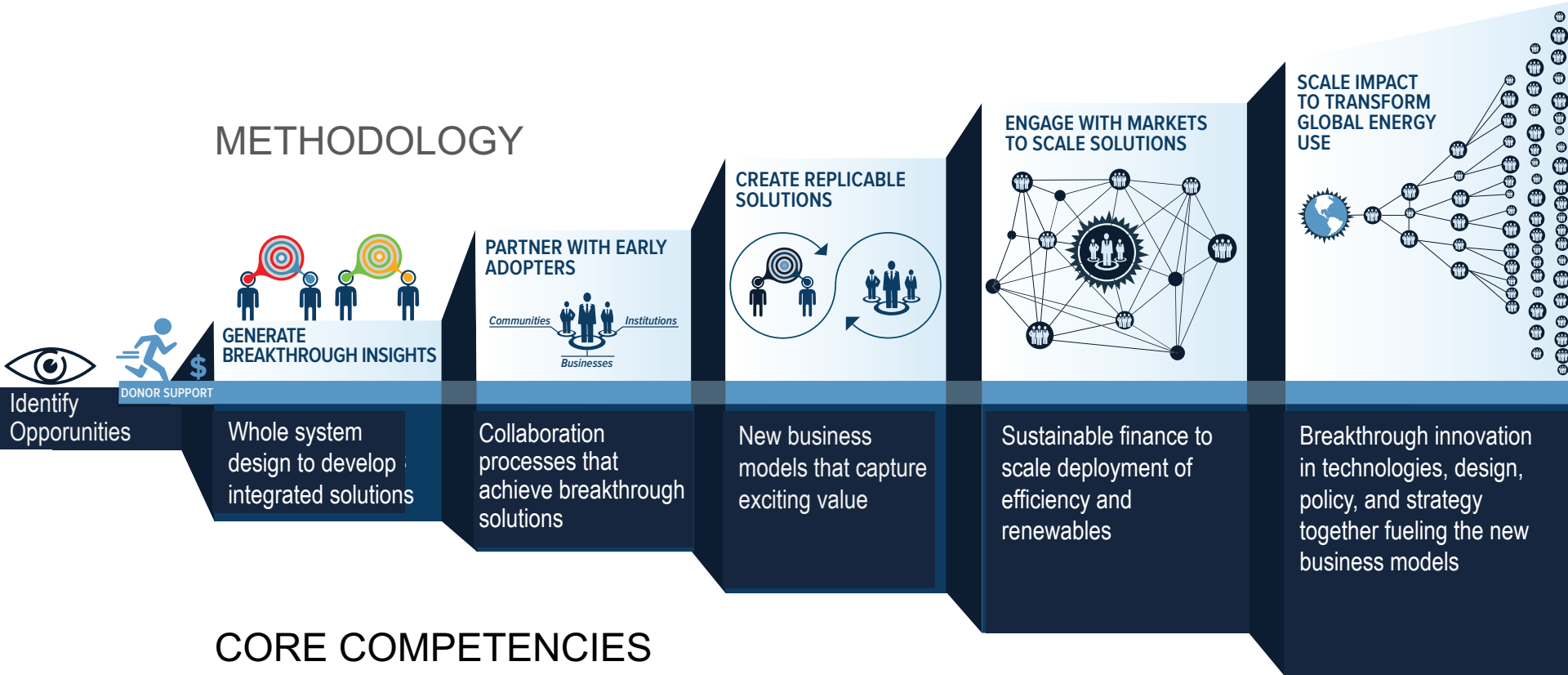


WHO WE ARE

**OUR MISSION IS TO
DRIVE THE EFFICIENT
AND RESTORATIVE
USE OF RESOURCES**



RMI's Theory of Change



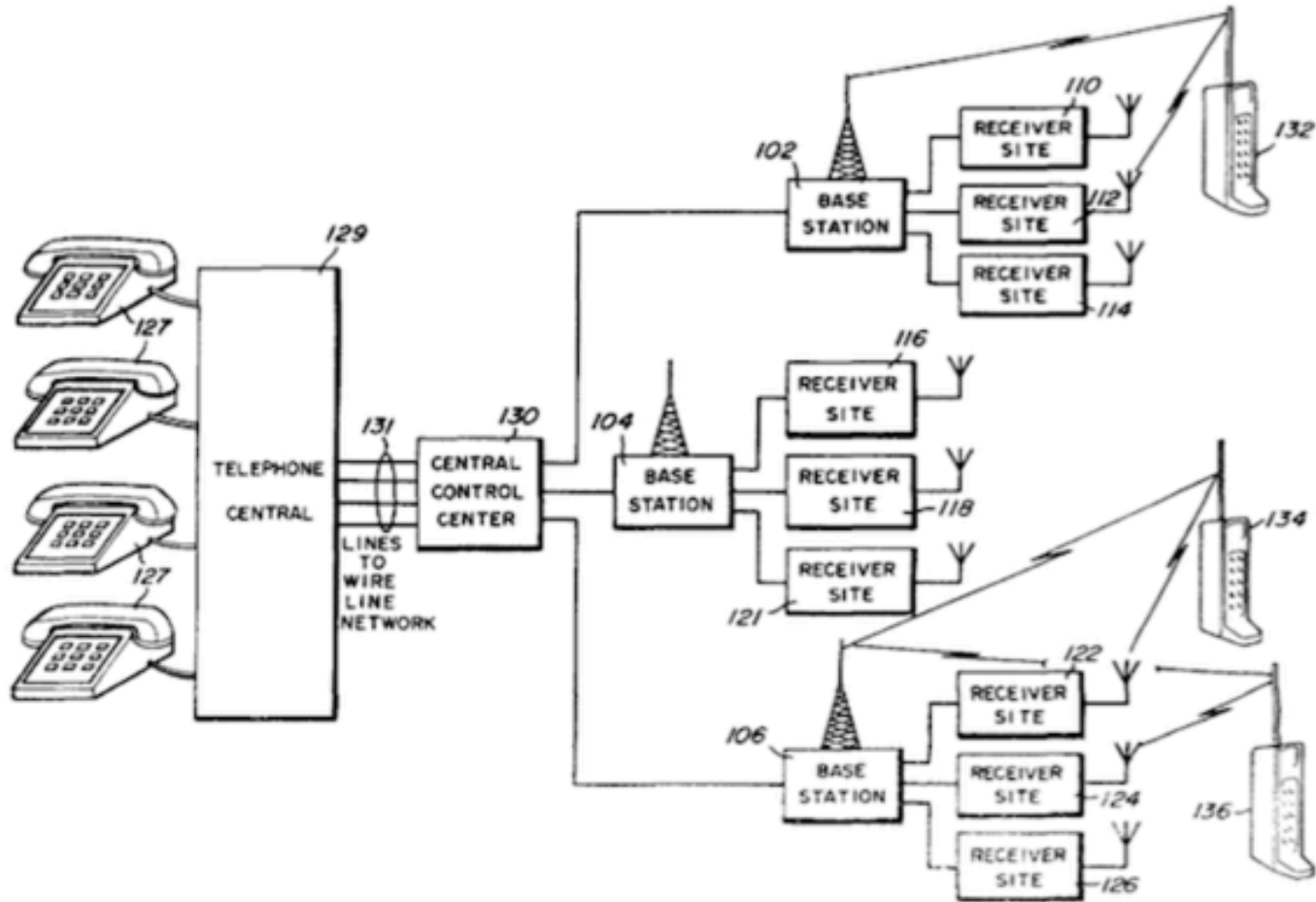


CONCEPT

The Problem



The Problem



Source: Garber, Megan. *8 Guys, 6 Weeks: How the Cell Phone Was (Finally) Invented*. The Atlantic. 2013.

The Solution

Energie Sprong



QUALITY

*Net-zero energy homes
with long performance
warranties*



NON-INTRUSIVE

*Refurbishment within a
week to 10 days*



AFFORDABLE

*Financeable through
energy cost savings*



LOOK & FEEL

*Attractive and
comfortable homes*

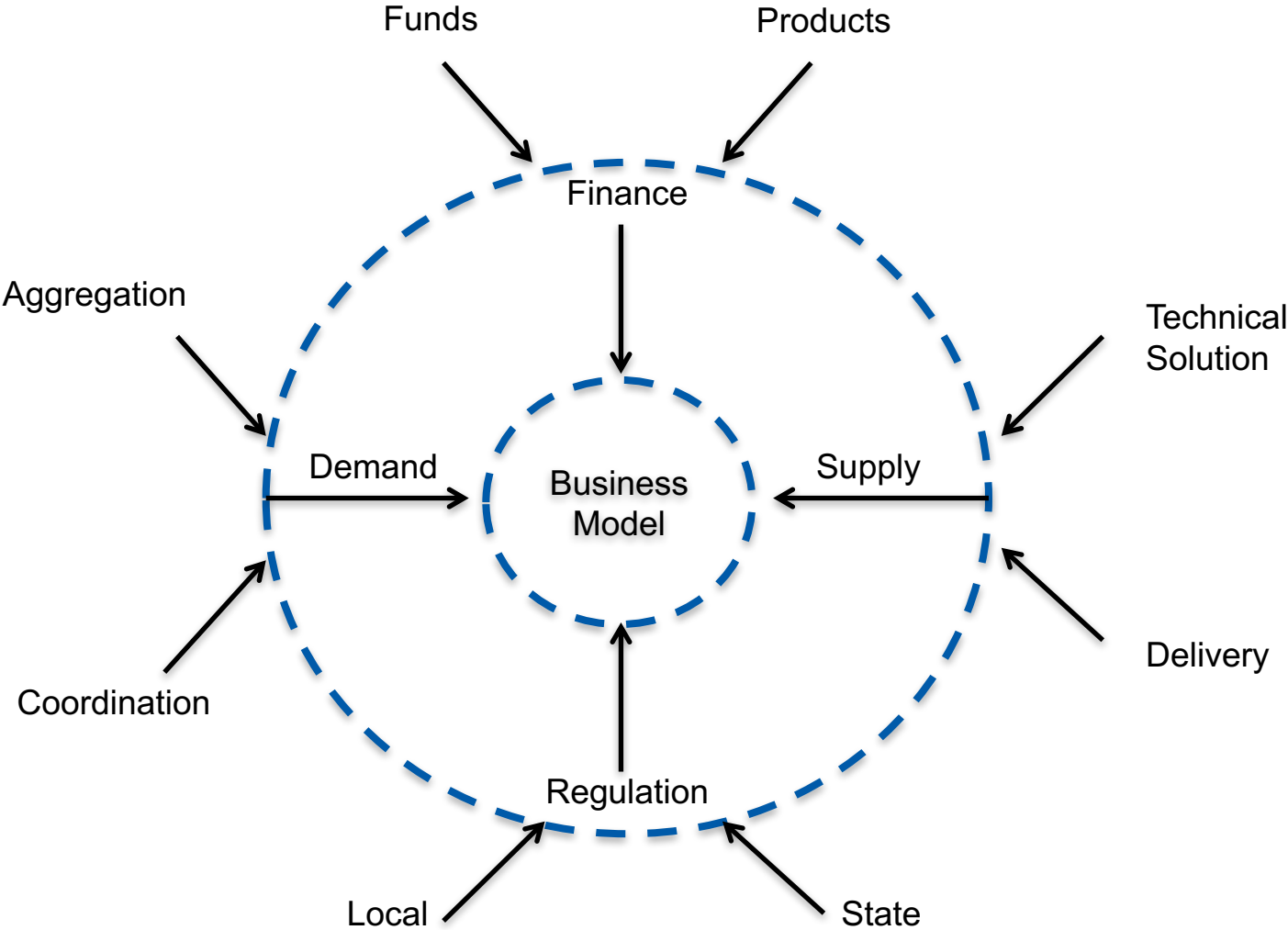








Market Organization Model



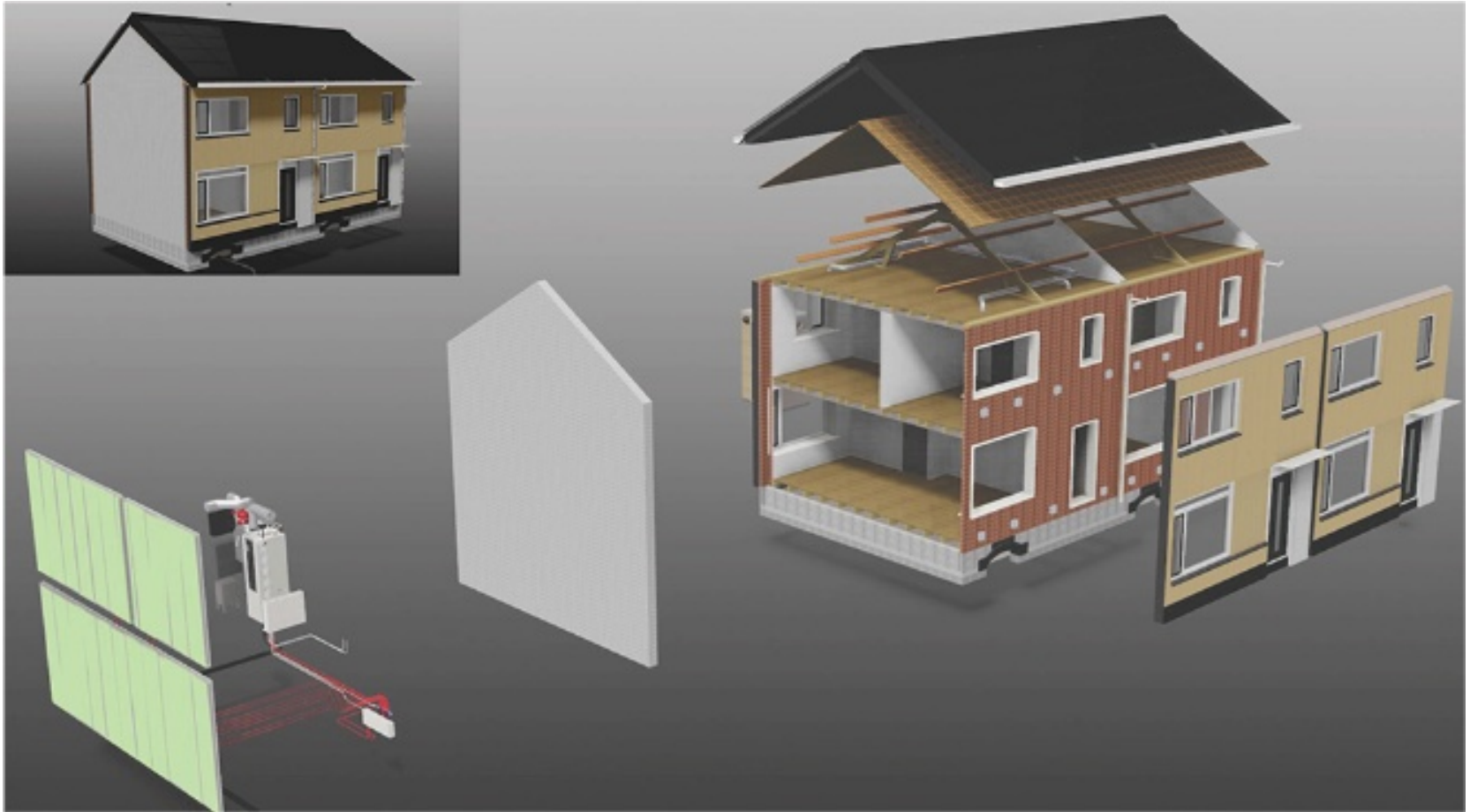


VALIDATING THE BUSINESS MODEL

Socializing the Concept – Supply



Technical Feasibility and the “Investment Envelope”



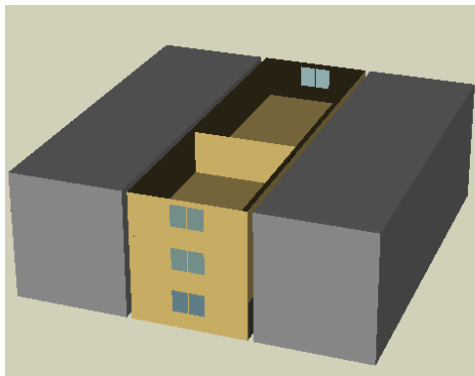
Feasibility

Is ZNE economically and technically feasible for San Francisco Bay Area affordable housing?

Category: 5-9 unit building
Market Share: 8.9% (~6.2K)

6 Unit Prototype

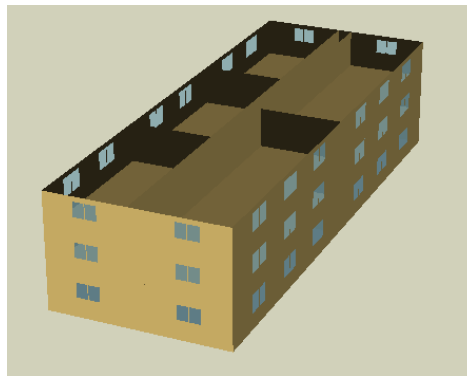
- Built pre-1980s
- 4,725 sf
- 3 stories
- Row home
- Furnace, no cooling*
- Individual gas HW heater



Category: 10-19 unit building
Market Share: 22.5% (~16K)

15 Unit Prototype

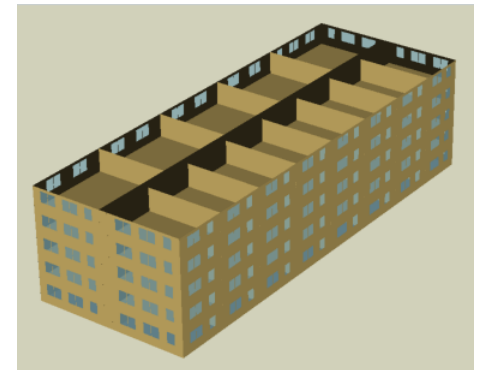
- Built pre-1980s
- 11,270 sf
- 3 stories
- Stand alone building
- Furnace, no cooling*
- Central gas HW heater



Category: 20+ unit building
Market Share: 66.2% (~46K)

65 Unit Prototype

- Built pre-1980s
- 40,900 sf
- 5 stories
- Stand alone building
- Central boiler, no cooling*
- Central gas HW heater



* 58% of San Francisco homes use natural gas, 36% electricity according to an ACEEE 2017 report

Value Proposition – 6 Unit Prototype

Business as Usual (no improvements)		REALIZE		Variance
<u>Assumptions</u>		<u>Assumptions</u>		
Units	6	Units	6	
Average Gross Rent	1500	Average Gross Rent	1500	
Utility Allowance (Energy Portion)	70	Utility Allowance (Energy Portion)	10	60
Net Rent				
INCOME				
Rental Income				
Gross Rents				320
Rental Losses				-
Other Revenue				-
TOTAL INCOME				320
EXPENSES				
Operating Expenses				
Administration				-
Utilities				
Electricity				690
Gas				760
Water + Sewer				455
Waste Removal				
O&M				
Maintenance Payroll				200
Maintenance Supplies				470
Contract Maintenance				420
Energy Services Agreement	\$ -	Energy Services Agreement	\$ 7,040	\$ 7,040
Taxes & Insurance	\$ 15,840	Taxes & Insurance	\$ 15,840	\$ -
TOTAL OPERATING EXPENSES	\$ 64,394	TOTAL OPERATING EXPENSES	\$ 58,489	\$ -5,905
Net Ordinary Income	\$ 37,158	Net Ordinary Income	\$ 47,383	\$ 10,225
Debt Service				
Debt Service	\$ 26,541	Debt Service	\$ 33,845	\$ 7,303
15 YR Debt Capacity	\$ 275,491	15 YR Debt Capacity	\$ 351,298	\$ 75,807
25 YR Debt Capacity	\$ 374,073	25 YR Debt Capacity	\$ 477,008	\$ 102,934

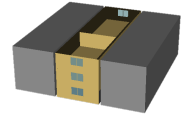
Increased 15 YR Debt Capacity:
\$75,807

Implication:
Initial REALIZE Project Budget:
\$75,807
(\$12,635 per unit)

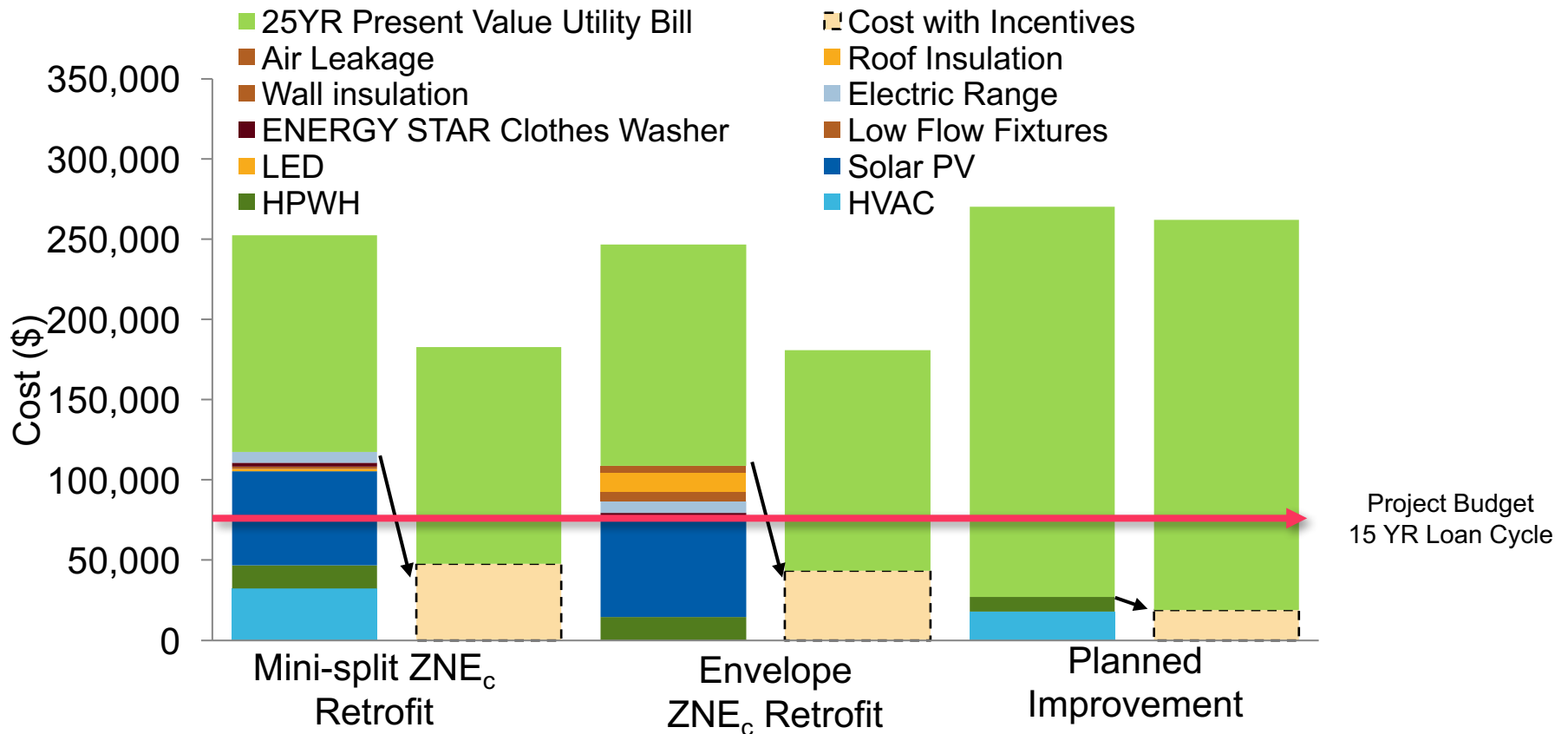
REALIZE
Potential
Budget

Note: Debt Service Coverage Ratio assumed to be 1.4. Debt capacity calculated using a 5% cost of debt and amortized over 15 years.
 * Utilities are assumed to be reduced 85% for electricity, 100% for natural gas, 20% for water and sewer. O&M costs are modeled to be reduced 25% and replaced with an Energy Service Agreement for a performance guarantee.

6 Unit Prototype: ZNEc Retrofit vs. Baseline



With incentives, the ZNEc retrofits is well below the increased debt capacity.



* The 25 YR PV was calculated using a 5% discount rate and an escalation rate of 2.35%, which is a blended average rate based on last 10 years of gas and electric escalation in California from the EIA. The water escalation rate is assume to be 5%, well below historical rates.

Value Proposition – 65 Unit Prototype

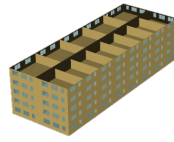
Business as Usual (no improvements)		REALIZE		Variance
<u>Assumptions</u>		<u>Assumptions</u>		
Units	65	Units	65	
Average Gross Rent	1500	Average Gross Rent	1500	
Utility Allowance (Energy Portion)	67	Utility Allowance (Energy Portion)	10	57
Net Rent				
INCOME				
Rental Income				
Gross Rents				60
Rental Losses				-
Other Revenue				-
TOTAL INCOME				60
EXPENSES				
Operating Expenses				
Administration				-
Utilities				
Electricity				89
Gas				07
Water and Sewer				20
Waste Removal				
O&M				
Maintenance Payroll				83
Maintenance Supplies				72
Contract Maintenance				72
Energy Services Agreement	\$ -	Energy Services Agreement	\$ 76,427	\$ 76,427
Taxes & Insurance	\$ 171,960	Taxes & Insurance	\$ 171,960	\$ -
TOTAL OPERATING EXPENSES	\$ 699,031	TOTAL OPERATING EXPENSES	\$ 647,115	\$ -51,915
Net Ordinary Income	\$ 403,424	Net Ordinary Income	\$ 499,799	\$ 96,375
Debt Service				
Debt Service	\$ 288,160	Debt Service	\$ 357,000	\$ 68,840
15 YR Debt Capacity	\$ 2,991,002	15 YR Debt Capacity	\$ 3,705,534	\$ 714,532
25 YR Debt Capacity	\$ 4,061,311	25 YR Debt Capacity	\$ 5,031,533	\$ 970,222

Increased 15 YR Debt Capacity:
\$714,532

Implication:
Initial REALIZE Project Budget:
\$714,532
(\$10,993 per unit)

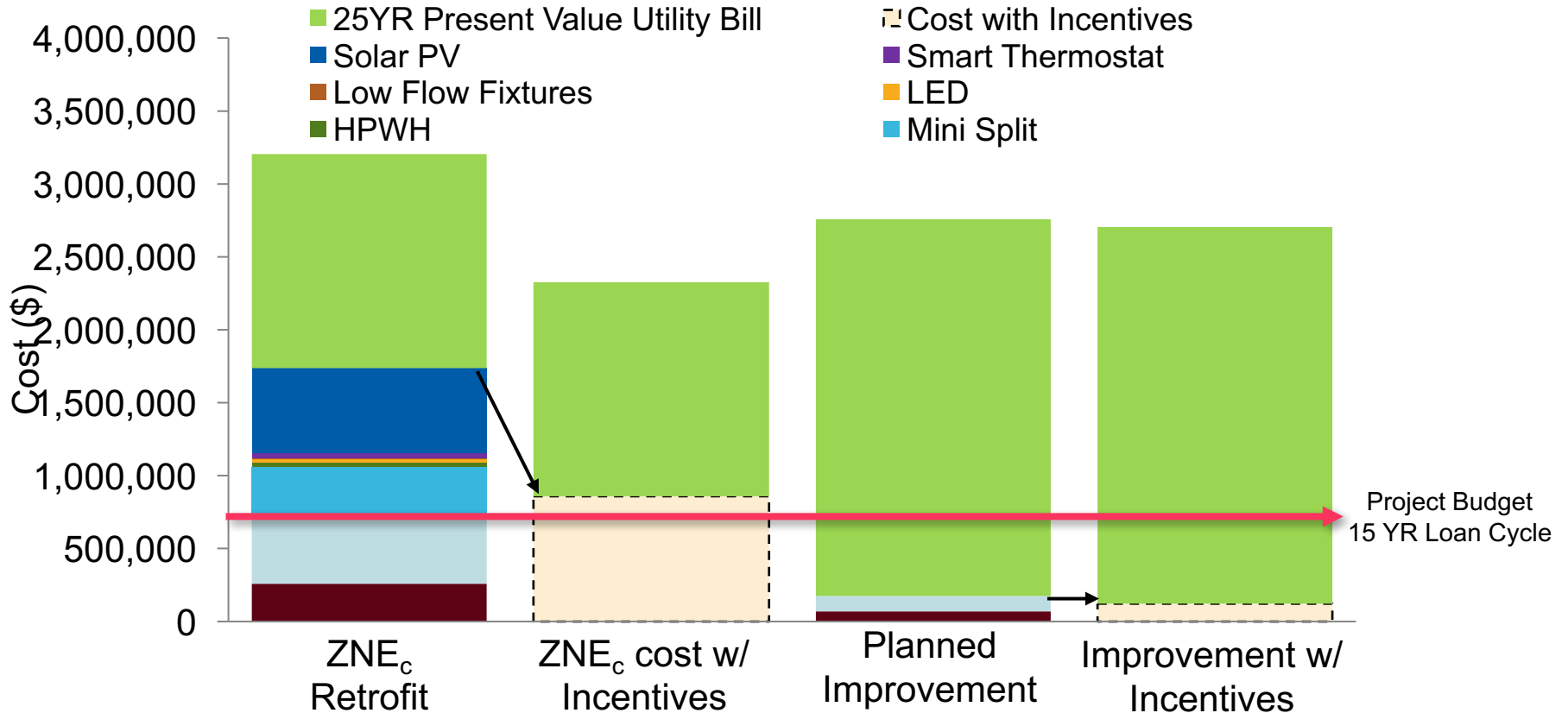
REALIZE
Potential
Budget

- Note: Debt Service Coverage Ratio assumed to be 1.4. Debt capacity calculated using a 5% cost of debt and amortized over 15 years.
- * Utilities are assumed to be reduced 85% for electricity, 100% for natural gas, 20% for water and sewer. O&M costs are modeled to be reduced 25% and replaced with an Energy Service Agreement for a performance guarantee.



65 Unit Prototype: ZNEc Retrofit vs. Baseline

Even with incentives, the economics are more challenging for larger, high rise buildings.



* The 25 YR PV was calculated using a 5% discount rate and an escalation rate of 2.35%, which is a blended average rate based on last 10 years of gas and electric escalation in California from the EIA. The water escalation rate is assume to be 5%, well below historical rates.

The Solution Cost Curve

With incentives most low-story projects are well in the money.

	6 Unit Prototype	15 Unit Prototype	65 Unit Prototype
Current Zero Net Carbon Retrofit Cost (\$/Unit)	\$19,013	\$22,255	\$22,296
Cost With Current Incentives (\$/Unit)	\$7,527	\$8,985	\$11,329
Price Point for 15 Year Discounted Payback Period (\$/Unit)	\$11,808	\$14,590	\$7,839
Cost Reduction Required for 15 Year Discounted Payback Period (Without Incentives/With Incentives)	37.9% / 0%	34.4% / 0%	64.8% / 30.8%

*Energy savings PV calculated using a 5% discount rate and an escalation rate of 2.35% for the 6 unit prototype, 2.28% for the 15 unit prototype, and 2.48% for the 65 unit prototype. Escalation rates are a blended average based on 10 years of gas and electric escalation in California from the EIA. Water and sewage savings calculated assuming 5% discount rate and 5% escalation rate.

Socializing the Concept – Demand



Challenges Pain Points: Demand

Model Addresses	Addressable Issues	Issues to Avoid
Trust in Accuracy of Models	Affordable Housing Has Low Risk Tolerance	Land Mines/Code Triggers
Maintenance	Compatibility of Multiple Funding Sources	Lender Tolerance
Tenant Disruption	Timing	Diversity of Building Stock
The Cost vs. Reward Balance	Technology Risk	SF Lacks Financing
Convenience	Public Policy Alignment	
Low Volume	Codes/Permits	
Technical Knowledge	Language/Perspective	

Challenges Pain Points: Supply

Model Addresses	Addressable Issues	Issues to Avoid
Risk of Underperformance	Technology Bias	Ineffective Zoning
Complexity	Prescriptive Code	
Perverse Incentives	Culture	
Supply Chain Engagement	Future Proofing	
Knowledge		Policy hurdles
Definitional Challenges		Rate Structures
High Risks w/Low Risk Tolerance		



**WHERE TO
FROM HERE?**

Strategic Priorities – Performance Assurance

Themes

Research

Action

Outcomes

Final Objective

Develop Energy Plan



Simplify & Improve Financing



Develop Integrated NZE Retrofit Solution



Aggregate Demand of Housing Providers



KEY TAKEAWAYS:

- Key to unlocking the market
- Differentiates between operational and behavioral risk
- Metering determines structure of contract

Drive efforts to expand UA adjustment

providers, financing)

Catalog property characteristics (syndication date, meter types, façade system)

Identify property characteristic (syndication date, meter types, façade system) to initially target

for performance

Draft standardized contracts

Draft large scale conditional contract between housing providers and solution providers

Execute conditional contract (financing, guarantee, energy plans, tech solution)

Leverage demand established in conditional contract to improve market conditions

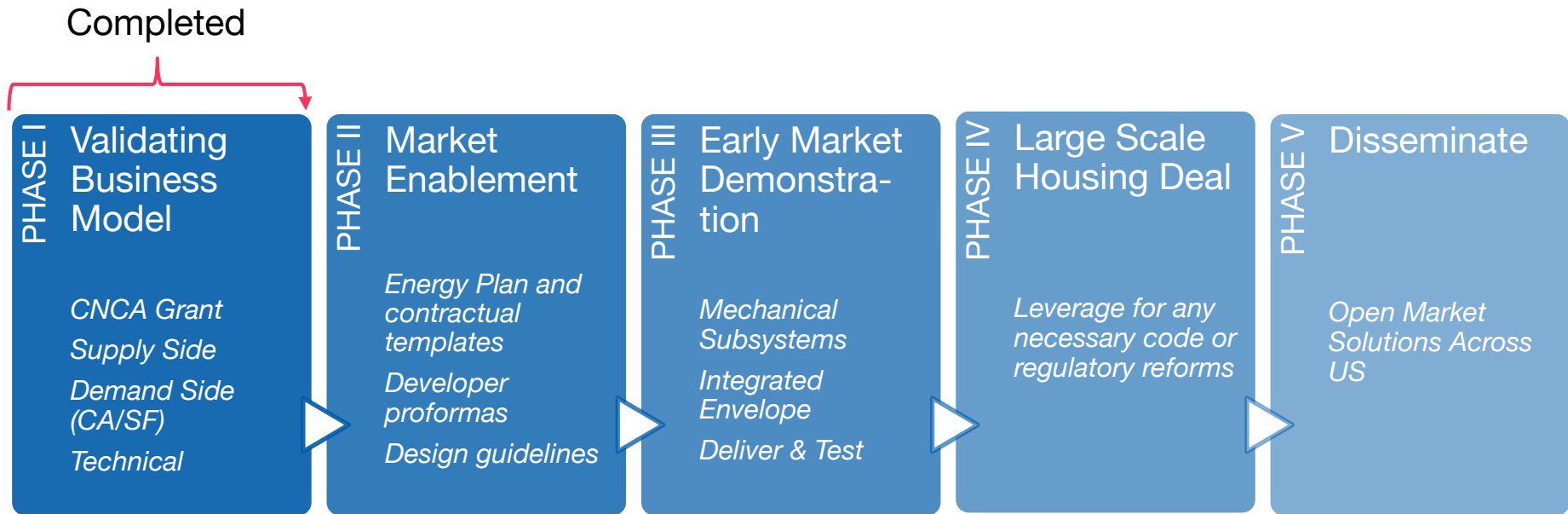
Strategic Priorities – Demonstration Projects



KEY TAKEAWAYS:

- Market wants to see the physical product
- NZE technical solutions exist
- Competitive bidding process will drive whole solution innovation and collaboration

REALIZE Timeline



Q3 2017 through Q2 2018

Q3 2018 through Q4 2020

Launch Q3 2018





Thank You

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