



Financial Options for Public Housing Authorities



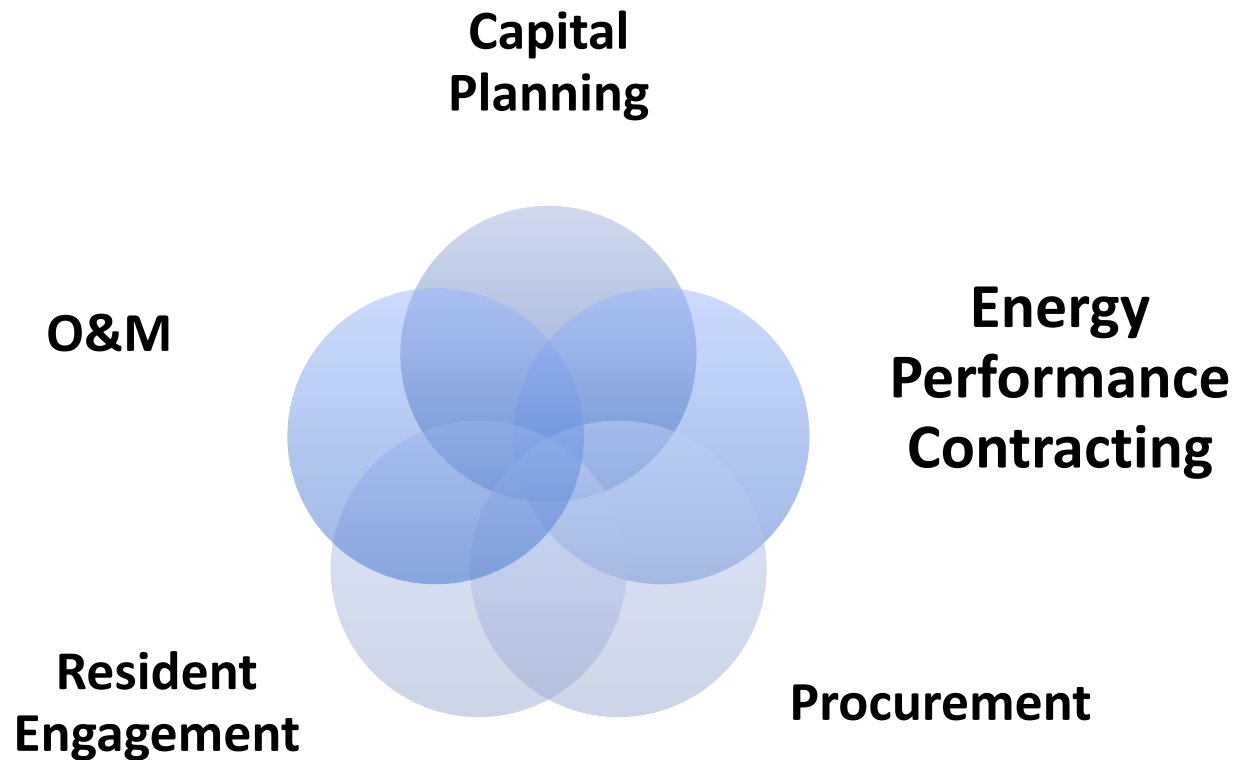
2015 Better Buildings Challenge Summit

Self-Managed Energy Performance Contracting

Chris Jedd – Denver Housing Authority



Integrating Energy and Water Conservation Into Your Portfolio



Energy Performance Contracting

A HUD approved method of financing energy and water conservation measures (ECMs) and capital improvements through future energy savings

Frozen Rolling Base or Add-On Subsidy

Energy Performance Contracting

EPC Financing Example

- Install a 92% efficient furnace
- Cost \$1,000
- Annual energy savings \$100/year

Financing Scenario # 1

- Loan amount: \$1,000
- Loan term: 10 Years
- Yearly payment: \$100

Financing Scenario # 2

- Loan amount: \$1,500
- Loan term: 15 Years
- Yearly payment: \$100

Excess capital \$500

Energy Conservation Measures (ECMs)

- ❑ **High Savings Return** – Low-flow water equipment and high-efficiency lighting typically pay-back over a relatively short period. Although a PHA may not need to install low-flow toilets from a physical needs perspective, this type of ECM helps to fund slower payback items the PHA does need.
- ❑ **High Value / Capital** – Windows are normally a good example of something a PHA needs. Unfortunately, the energy cost to savings ratio associated with new windows is normally not adequate to cover their costs over a 12-20 year period. Excess savings produced by quicker payback ECMs can be used to bridge the shortfall.

Generally speaking, the goal of an EPC is not just reducing utility consumption. It is a means by which additional funding can be secured to meet real capital needs. Often, capital needs which are already included in Capital Fund budgets and/or 5-year plans.

EPC – Traditional ESCO Model

Benefits

- ❑ Turn key process
- ❑ No savings risk
- ❑ No out of pocket costs
- ❑ Energy savings

Risks

- ❑ ESCO takes a large fee
- ❑ Less scope
- ❑ Less customization
- ❑ Little staff input
- ❑ Little resident input

EPC – Self-Managed Model

Benefits

- ❑ Lower soft cost/less fees
- ❑ More scope & capital improvements
- ❑ Staff involvement
- ❑ Resident involvement
- ❑ Local talent
- ❑ More control over the project

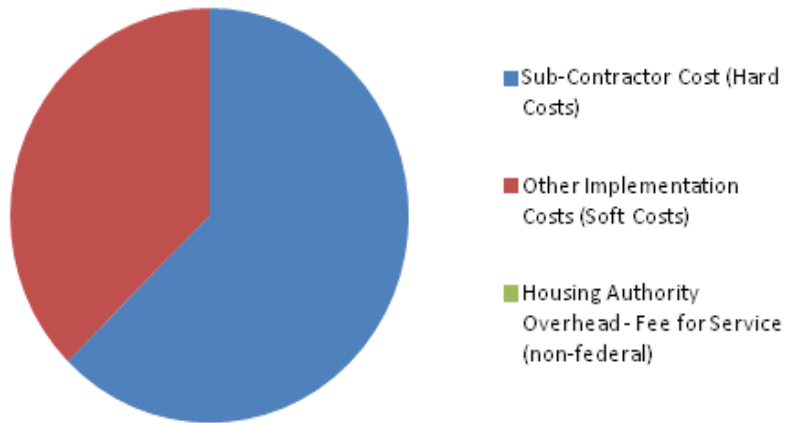
Risks

- ❑ Staff time
- ❑ Savings risk
- ❑ Pre-construction costs
- ❑ Picking firms that don't perform

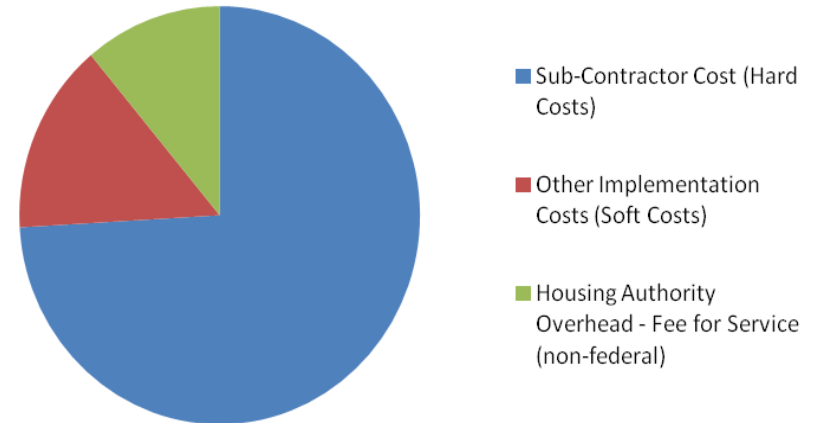
EPC Financial Analysis

ESCO V.S. Self-Managed Model

Esco Driven EPC

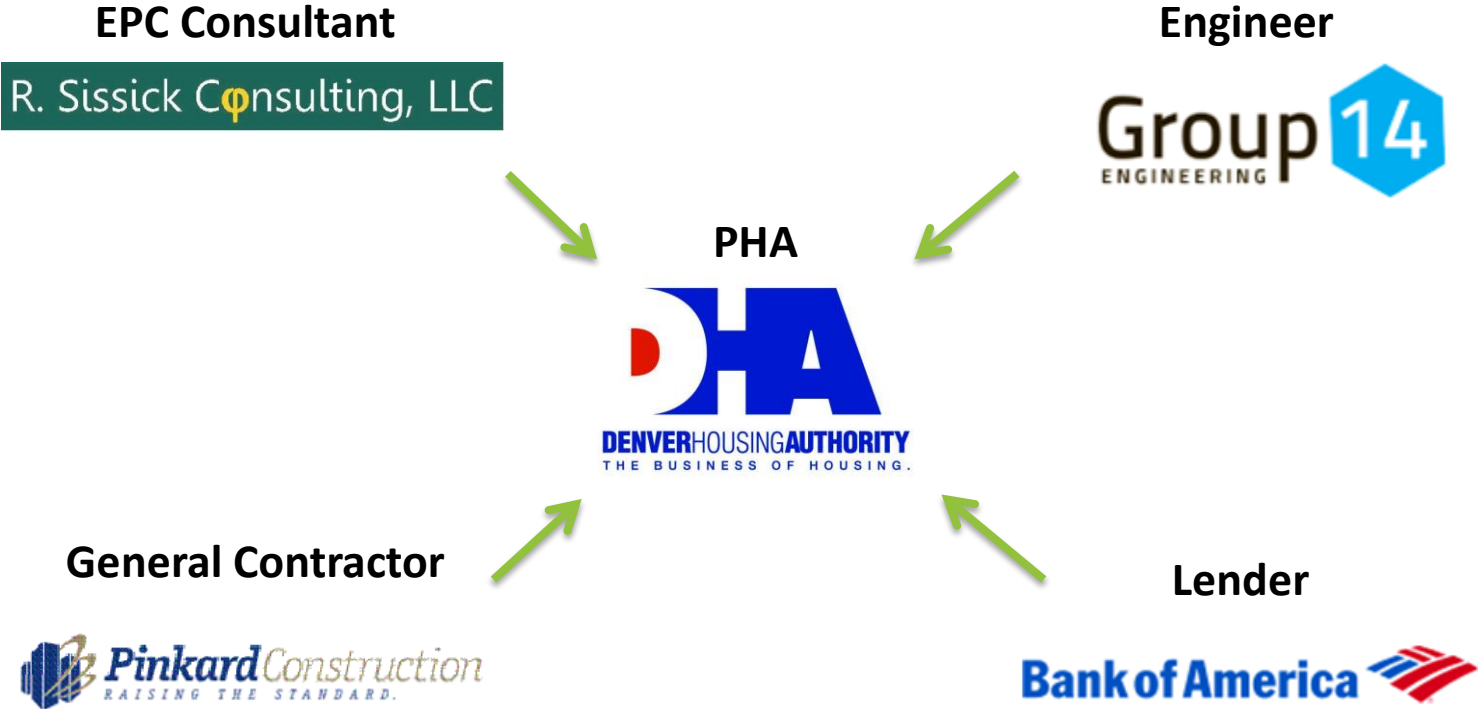


DHA Assisted Self Implementation

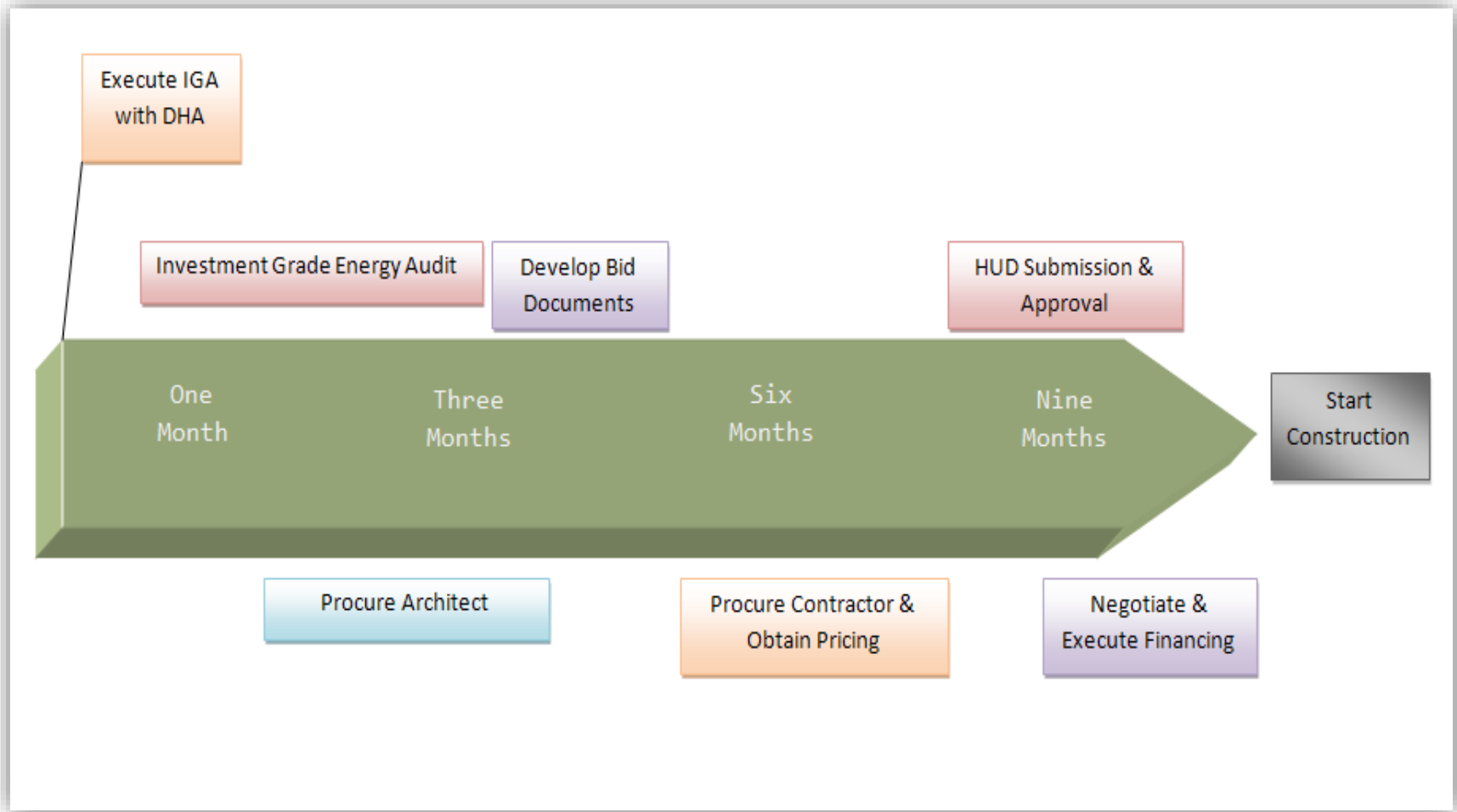


	ESCO Model	Self Managed
Hard Cost	66%	75%
Soft Cost	34%	12%
PHA Admin Fee	0%	13%

DHA Self-Managed EPC



Project Development Timeline



2014 Measurement and Verification

Total 2014 Savings - \$2.8 Million

Water & Sewer Savings

\$1.5 million

45% reduction from
baseline year

Natural Gas Savings

\$850,000

35% reduction from
baseline year

Electric Savings

\$501,000

17% reduction from
baseline year

On Going Energy Management



- ❑ Utility Analysis
- ❑ Training Programs for Staff
- ❑ Enhanced Operations and Maintenance Procedures

Resident Engagement Programs

Empowering DHA Residents to Conserve Energy



Questions?

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HOUSING AUTHORITY
Opportunity Lives Here

Beyond the Financing

Financial Opportunities for Public Housing Authorities

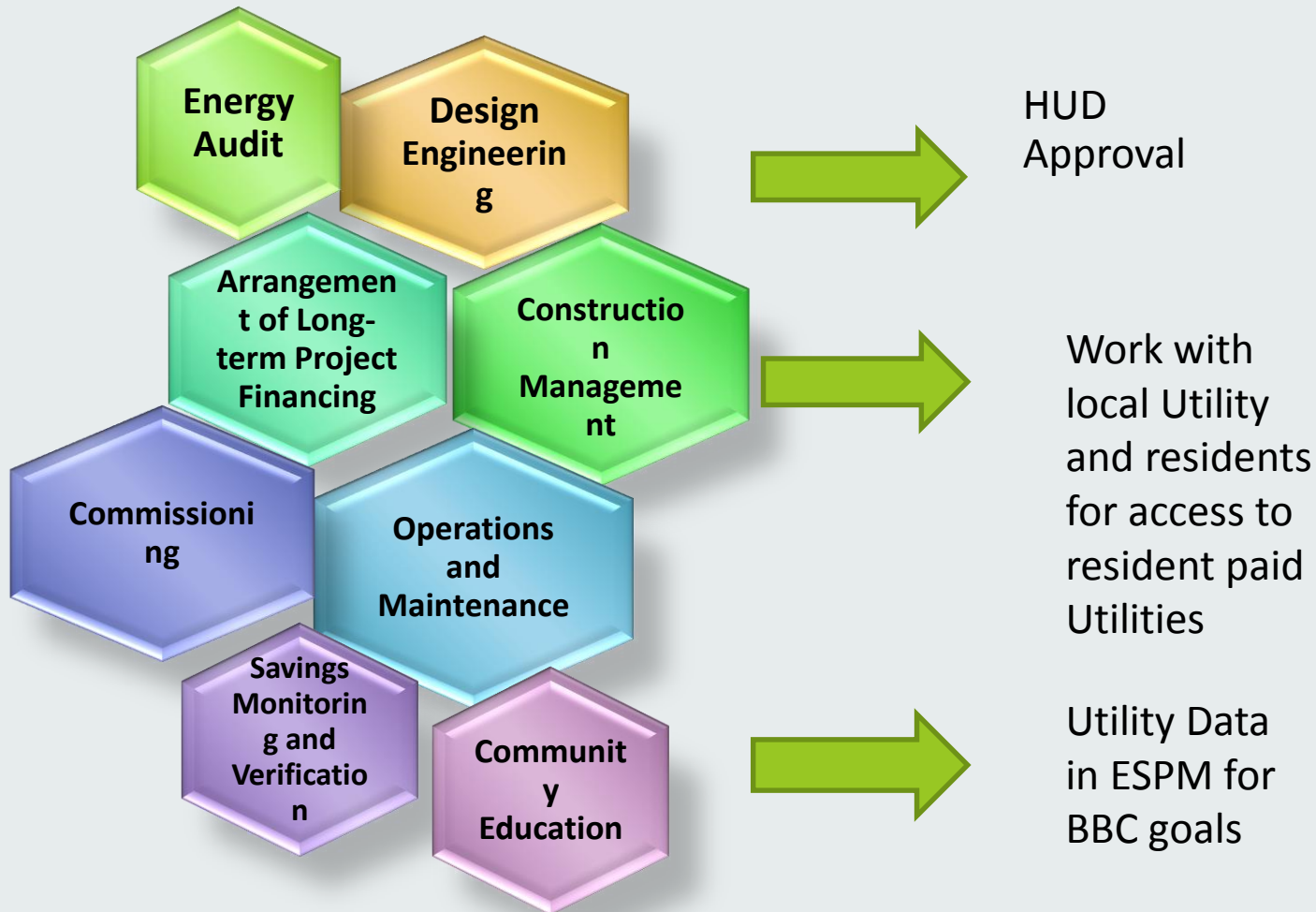
5/27/2015

Strategies

- Self-Implemented Energy Performance Contract (EPC)
 - Housing Authority (HA) retain up to 40% more dollars for additional physical improvements, staff, or any financial gaps compared to hiring an ESCO (Energy Service Company)
 - HA staff are intimately integrated in the projects and work together to fulfill needed outcomes

- What EPC's Can Finance
 - Renewable Energy Systems
 - Water Conservation
 - Central Plant optimization
 - HVAC
 - Roofs
 - Windows
 - Lighting Fixtures
 - Systems that are “energy efficient”
 - Client Education

Strategies



Strategies

- Commissioning (Installation)
 - Requires performance measurements to ensure systems are working properly

- Operations and Verification (Post-Installation)
 - Important to identify the proper Energy Conservation Measure to predict savings
 - Baselines must be accurately defined
 - Proper equipment and systems must be properly installed and commissioned
 - Ensure all equipment performs to specifications
 - Reduces risk of non-performance

Challenges

- **Utility Allowance Changes**
 - Clients are directly effected by the project implementation in resident-paid units
 - Some allowances increase, as others decrease
- **Client Education**
 - Breaking down how the EPC works
 - Success depends on the residents ensuring all measures remain in unit
 - Informing residents of utility allowance changes
 - Many residents at Family sites do not engage in community meetings
- **Gaining Utility Consumption Access for the Better Buildings Challenge (BBC)**
 - Working with local utility company and legal to create a release form
 - Ensuring all residents sign release
 - Working with Energy Star Portfolio Manager (ESPM) consultants and local utilities to ensure client data can be automatically uploaded into ESPM
 - Establishing campuses within the system with individual addresses
 - San Antonio Housing Authority is still working on this step

Suggestions

- Start talking to your local utility as soon as possible, if you are going to use an EPC as one way to achieve your BBC goals
- Be persistent with resident education and staff education
- Ensure everyone works collaboratively

Coming Up

- Finish EPC implementation by 2016
- Discussions of Phase 2
- Coordinate all EPC projects and comprehensive modernizations with the BBC and ESPM

Thank You

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Using Energy Performance Contracts to Implement Public Housing Utility Infrastructure Improvements - Experiences Before and After RAD -

May 27, 2015

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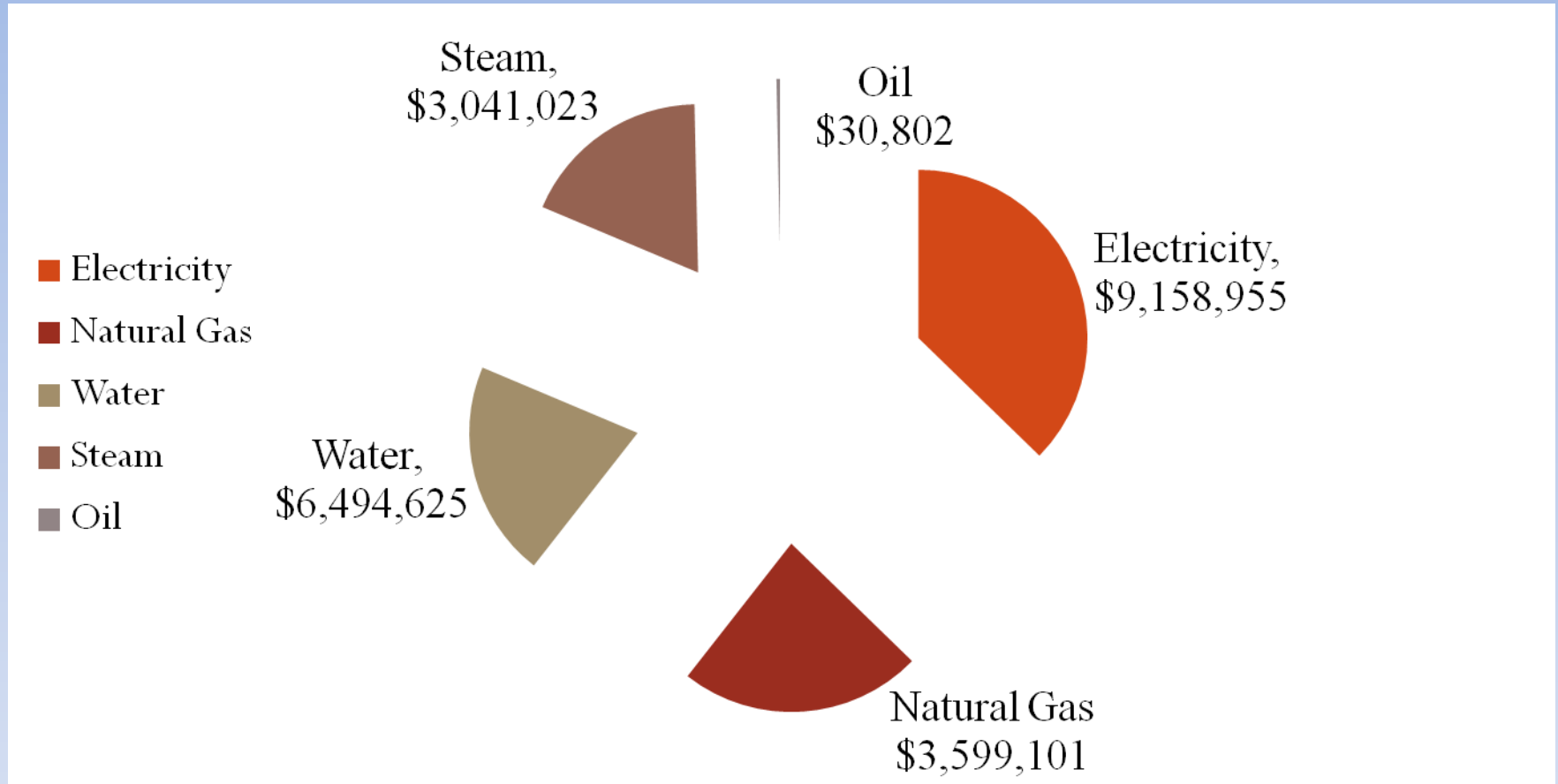
Presented at:

2015 Better Buildings Summit
Washington, D.C.

Introduction to HABC

- Public Housing Authority for Baltimore City, since 1937
 - Serves over 10,000 families in 11,000 housing units
- Baltimore Housing Choice Voucher Program provides an additional 16,000 families with rental housing subsidies
- Housing stock “currently” comprised of
 - 31 conventional developments, plus scattered site units
 - 21 privately managed and
 - 9 affordable developments

Current Utilities Paid by HABC



Total Utility Cost for Calendar year 2012: \$22+ Million

HABC's EPC Philosophy

- Use excess savings to leverage replacement of aged energy/utility infrastructure
- EPC-1 was designed around this objective
 - Nominal \$50mm project
 - Involves 5 developments responsible for about 40% of the total utility budget
- EPC-1 (supplemented by ARRA* funding), addressed
 - New heating & domestic hot water piping systems
 - Cherry Hill Homes
 - Latrobe Homes

* American Recovery and Reinvestment Act (ARRA)

EPC-1 Targeted Serious infrastructure needs at Cherry Hill Homes & Latrobe Homes

- Cherry Hill Homes
 - Served by District “steam” provider
 - HABC owns entire Heating Water (HW) distribution system
 - Deteriorated
 - Leaking
 - Apartment heating convectors un-controlled
- Latrobe Homes
 - Served by district steam provider
 - HABC owns entire steam distribution system
 - Deteriorated
 - Leaking
 - Apartment heating radiators un-controlled

Cherry Hill Heating Water Distribution Systems - Before -



Zone Control Valve



DHW Control Valve

Cherry Hill Homes Heating Water Distribution Systems

- Before -



CH H₂O Heater/Gas Submeters



CH Uninsulated Floor Slab

EPC-1 Resolved Serious Infrastructure Needs at Cherry Hill Homes & Latrobe Homes

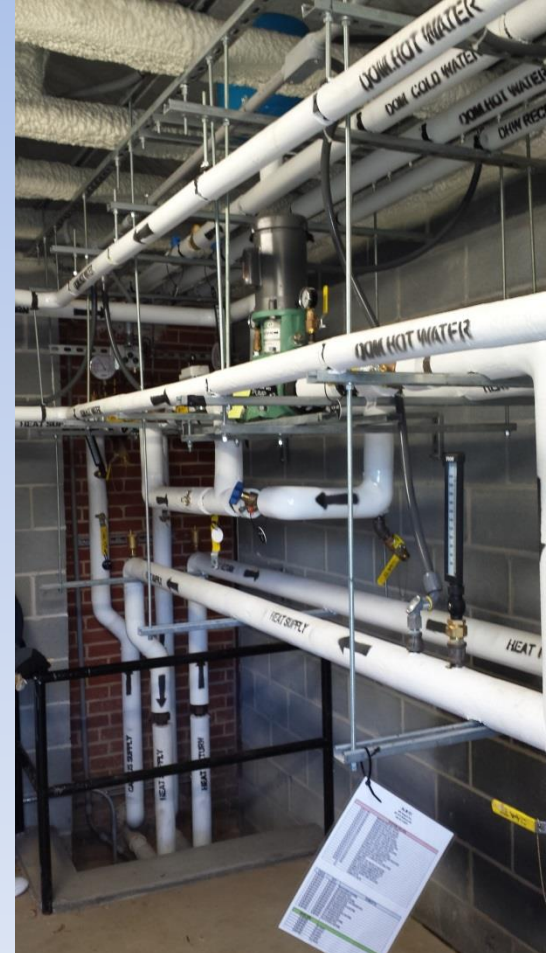
- Cherry Hill Homes
 - New distribution system (partial – addressed the worst) & new temperature limiting convectors in apartments
- Latrobe Homes
 - New HW (heating water) distribution system & new temperature limiting HW convectors in apartments

Cherry Hill Heating Water Distribution Systems

- After -



CH Piping



CH Piping

Latrobe Homes Heating Water Distribution Systems

- After -



Latrobe Main HW Pumps



Latrobe DHW System



Latrobe HW Convectors

FYE-14 Savings for Infrastructure Projects at Cherry Hill Homes & Latrobe Homes

- Latrobe*
 - Baseline steam (normalized): 63,556 k-lbs
 - 2014 steam (normalized): 31,974 k-lbs
Savings: 31,582 (50%)
- Cherry Hill
 - Baseline steam (normalized): 86,435 k-lbs
 - 2014 steam (normalized): 63,397 k-lbs
Savings: 23,038 (27%)

* Latrobe also has tariff rate reduction savings

Plans for EPC-2 - Before RAD -

- Replicate infrastructure improvement philosophy, initial primary targets were
 - Perkins Homes
 - Douglass Homes
- Initial EPC-2 Program
 - Nominally 25 sites
 - Likely another \$50mm+ EPC project
 - Capable of significant infrastructure support

RAD Program Opportunity Removes a Number of Developments From EPC-2 Program

- Virtually all high-rises are removed: Had been a source of low payback measures capable of supporting infrastructure needs

Original Sites	Before RAD	After RAD	Original Sites	Before RAD	After RAD
Perkins	X	X	Ellersile Apts.	X	
Douglass	X	X	Hollins House	X	
BelPark Tower	X		Somerset Ct. Ext	X	
J Van Story Branch	X		PVG	X	
Bernard Mason	X		Dukeland	X	X
Lakeview Tower (and Ext)	X		Rosemont	X	X
Poe Homes	X	X	PVG Senior Building	X	
Monument East	X		Oswego Mall	X	X
Chase House	X		Mc Culloh (Low-rise)	X	X
Govans Manor	X		Mc Culloh (High-rise)	X	
Allendale	X		Midtown Apts.	X	
Wyman House	X		Stricker St. Apts.	X	
Primrose Place	X		Uptown Apts.	X	
Rosemont Tower	X				

Current EPC-2 Candidate Sites

Sites	After RAD	Additional Sites	After RAD	EPC-1 Sites - add 'I ECM's	After RAD
Perkins	X	Mount Winans	X	Gilmor	X
Douglass	X	O'Donnell Apts	X	Latrobe	X
Poe Homes	X	Spencer Gardens	X	Westport	X
Dukeland	X	Carey House	X	Brooklyn	X
Rosemont	X	Scattered Sites	X	Cherry Hill	X
Oswego Mall	X				
Mc Culloh (Low-rise)	X				
Laurens House	X				

Current Planned EPC-2 Program Size/Performance

- EPC-2 now envisioned as a much different project
 - Smaller: \$8 to \$14mm (instead of \$50+mm)
 - Shorter term: 13 years instead of 20 years
 - Minimal to no excess savings available for infrastructure improvements

Concluding Observations

- EPC's can be an excellent mechanism for replacing aged utility infrastructure for public housing
 - Requires reasonably large project with favorable savings to investment ratio to “pay” for the infrastructure
- RAD, although likely to have an overall positive impact on the PHA mission, in this case has negative impact on the planned EPC program objective
 - Obvious loss of sites, and
 - In this case, loss of sites with excellent savings to investment ratio characteristics
- Still looking for means to address utility infrastructure needs for Douglass Homes, Mc Culloh Homes, Poe Homes & possibly Perkins Homes