Meet Up Agenda

- Part 1 8:30-10am
  - Welcome and Summit Highlights
  - Case Study 1: Mercy Housing
  - The Year Behind and 2018 Data Drive Results
  - Roadmap to 20%
  - Partner Recognition
  - Goal Achiever Remarks: Jersey City Housing Authority
Meet Up Agenda

- Part 2 10:30-12pm
  - Case Study 2: Shepherd Park Apartments
  - Financial Navigator Demo
  - Case Study 3: Tenderloin Neighborhood Development Corporation
  - The Year Ahead
  - Closing Announcements
Ask an Expert Lounge

**Wednesday 3:30-4:00pm**
- Building Envelope (*Melissa Voss Lapsa, ORNL*)
- Water Efficiency & 50001 Ready (*Prakash Rao, LBNL*)
- Steam & Energy Assessments (*Thomas Wenning, ORNL*)
- Portfolio Resilience Planning and Implementation
- Specialty Facilities (Labs and Data Centers)
- Facility Related Control Systems Security

**Thursday 10-10:30am**
- Plug & Process Loads (*Kim Trenbath, NREL & Sormeh Konijav, Waypoint Building Group*)
- Building Envelope (*Simon Pallin, ORNL*)
- DOE Tools (*Harry Bergmann, DOE*)
- Federal Agency Reporting & Accountability
- Federal Workforce Development & Engagement
- ESPC, UESC, and Appropriations Project Development

**Thursday 3:30-4pm**
- Plug & Process Loads (*Kim Trenbath, NREL & Sormeh Konijav, Waypoint*)
- DOE’s Energy Assessment and Management Software (*Thomas Wenning, ORNL*)
- Process Heating & Waste Recovery (*Sachin Nimbalkar*)
Don’t Miss Today:

- 12:30-2pm Lunch and keynote/plenary with Department of Energy leadership
- 2-3:30pm Resilience Roundtable
- 6-7:30pm Summit Reception
- 7:30pm Multifamily Sector Dinner (see sign up sheet)
Thursday’s Multifamily Sessions

8:30-10: Institutionalizing Energy Efficiency
10:30-12: Getting a Running Start
12:00-2: Lunch, Partner Recognition, BBC Swap Panel
2-3:30: Risky Business
4-5:30: Building Futures
Overcoming Obstacles to Implement Large Scale Efficiency in a Diverse Portfolio
Mercy Housing

- Largest Affordable Housing Nonprofit in US
- Developer, owner, manager
- ~320 owned properties
- ~23,000 units
- ~22.5M sf (owned)
- 22 States
- Mostly LIHTC, HUD (Section 202, Section 8), USDA RD
What’s the problem?

• Objectives
  • Reduce operating expenses
  • 20% energy and water reduction portfolio wide

• Barriers
  • Lack capital
  • Split incentives
  • Payback periods
  • LOC and loan adversity or inability
  • Non-fungible savings/pencil at each property
  • Cannot re-invest savings starting with low hanging fruit
  • Equipment O&M
  • Gaining internal buy-in
  • Snowflake portfolio
Transparent ESCO

- No capital investment
- Pay from actual savings – performance incentive
- Shared savings
- No property loan, lien
- No O&M costs during contract
- Reduced O&M burden on Mercy staff
- Substantial state & utility subsidies
- Experienced implementation team
- Proven techniques and technologies
- 10-year agreement
- UA adjustments
Whole Tree Approach

USE LOWER HANGING FRUIT TO REACH THE TOP

- Need Blended Payback Period to be less than PPA/ESA Term(s)

<table>
<thead>
<tr>
<th>Simple Payback in Years</th>
<th>Lighting and Controls</th>
<th>Water</th>
<th>DHW/Other Smaller Systems</th>
<th>HVAC Systems</th>
<th>Solar Thermal</th>
<th>Solar PV</th>
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There is more than 1 tree

WHOLE PORTFOLIO RETROFITS
Project Overview

• Mercy Housing California
  – 114 properties (100% of CA portfolio) evaluated
  – 38% of Mercy Housing entire portfolio
• $6.3M capital
• $11M property savings (15 years)
• Phase 1 – Whole Building, Deep
  – 12 properties
  – Complete in 2017
• Phase 2 – Whole Building and Prescriptive
  – ~25 properties
  – Implementation underway
• Phase 3 - Prescriptive
  – ~65 properties ~ Q2-Q4 2019
Rebate Programs

- California Low Income Weatherization Program
- Bay Area Regional Energy Network
- Southern California Regional Energy Network
- Marin Clean Energy
- Pacific Gas and Electric Utility
Phase 1a Overview

- **Capital Value** (one time sum) $1,976,678
- **Unexpected Costs** (one time cost) $(68,006)
- **Total Project Utility Savings Utility** (Project to Date [April 2017 – May 2018]) $80,720
- **O&M Savings** (annual) (Project to Date [April 2017 – May 2018]) $15,300
The Environmental Impact

Overall energy consumption: 5,091 mmBTU
32%

= 293,745 pounds of burned coal

Overall water consumption: 637,450 gallons
4%

= 37,061 8 minute showers
### Property Case Study

- Common Area and In-unit Lighting
- Energy Star Washers and Refrigerators
- Low-flow Faucet Aerators
- Tub Diverter
- Heat Pump Water Heaters
- Domestic Hot Water Recirculation Flow Control
- Domestic Hot Water Piping Insulation
- Retro-commission Steam Cycle Control, Orifice Plates, Service Steam Traps
- Condensate Receiver Tank Insulation
Consumption Impact

Energy Consumption

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<tr>
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<th>Baseline Consumption</th>
<th>Post Implementation Consumption</th>
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Water Consumption

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27% consumption reduction in Energy
15% consumption reduction in Water
Early Lessons

• Setting baseline
• Uncovering of property issues
• Cold water bypass/distribution
  – 50% of MF properties?
  – No 0.5s
  – Recirculation flow control
  – Hybrid mode operation of HPWH
• Blame Game
• Ongoing program perception
• Ongoing O&M, turnover, warranty claims, who to call
Caitlin Rood
Mercy Housing
National Environmental Sustainability Director
crood@mercyhousing.org
303.830.6213
www.mercyhousing.org
The Year Behind: MF Sector Update
Multifamily Sector Partners

105 multifamily partners
750,000 Housing Units
625 Million Square Feet
10 Trillion BTUs saved
$95 Million saved
40 Units  178,000 Units

Cion Housing  New York City Housing Authority
New Mexico  New York
Utility Benchmarking Pipeline

- Not Sharing Data
- Actively benchmarking
- Achieved Data Display

August 2016

- 82p ➔ 14p ➔ 15p

August 2018

- 22p ➔ 13p ➔ 69p
Multifamily Partners Data Reporting Progress

Number of MF Partners

- Total Partners
- Partners Submitting Data
- Published Displays

Year:
- 2014: 5
- 2015: 27
- 2016: 34
- YoDa: 67
- 2017*: 69

Total Partners:
- 2014: 89
- 2015: 111
- 2016: 111
- YoDa: 105
- 2017*: 81
Shared Square Footage Progress

Milion Square Feet

- Committed Sq. Ft.
- Shared Sq. Ft
- Published Sq. Ft.

Data Points:
- 2014: Committed 350, Shared 8, Published 8
- 2015: Committed 606, Shared 175, Published 15
- 2016: Committed 575, Shared 329, Published 260
- 2017: Committed 575, Shared 425, Published 322
- YoDa: Committed 686, Shared 514, Published 295

Graph shows the progression of committed, shared, and published square footage from 2014 to 2017.
Energy Savings: BBC MF Sector

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<td>264,312,104</td>
<td>451,025,071</td>
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<td>PHA</td>
<td>20,838,771</td>
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<tr>
<td>Mixed</td>
<td>5,030,048</td>
<td>720,113,820</td>
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<td>Total</td>
<td>35,928,916</td>
<td>1,625,003,964</td>
<td>2,869,757,076</td>
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Cumulative Energy Savings per Reporting Year

- Mixed
- PHA
- Affordable
Cost Savings: BBC MF Sector

Cumulative Cost Savings per Reporting Year

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<td>$2,460,546</td>
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<tr>
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<td>$199,743</td>
<td>$5,962,282</td>
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<tr>
<td>Mixed</td>
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<td>$6,697,296</td>
<td>$7,056,925</td>
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<tr>
<td>Total</td>
<td>$344,385</td>
<td>$15,120,124</td>
<td>$27,107,738</td>
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EUI Reporting Progress

Progress in Reducing EUIs:
- Fannie Mae Survey: EUI of 127 based on 1,000 properties
- BBC EUIs based on 110 properties reporting all 3 years
- 22% decrease in energy use intensity
BBC MF Energy & Water Efficiency Resources @ HUD Exchange

- Utility Benchmarking
- Building and Product Standards
- Retrofit Planning
- Operations and Maintenance
- Resident Engagement
- Retrofit Finance
MF Open Calls: Peer-to-Peer Exchange

- 4 Open Calls/year
- Mini-webinar peer learning exchange
- Featured partner(s) presenting
Thank you!
2018 Data Drive Update
Important Dates to Remember

• January 1st – December 31st

BBC Multifamily Goal Achievers

Goal Achievers
- Jersey City Housing Authority - 26% (2018)
- JCHE - 24% (2017)
  (≥ 95% Whole Building data & > 20% energy savings, IM and Showcase)

Near Goal Achievers
• Trinity Housing Corporation of Greeley, Colorado – 18%
• Cambridge, MA Housing Authority – 18%
• Atlanta Housing Authority – 17%
• The Renaissance Collaborative – 17%
• Danville Development – 15%
Partner Reporting Progress

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<th>Reporting Period</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>YoDa</th>
<th>2018</th>
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Partner Reporting Progress

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Square Footage Reporting Progress

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<td>Sq. Ft. Shared</td>
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<td>Sq. Ft. Published</td>
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Square Footage Reporting Progress

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2018 Data Drive Update

Top Challenges & Successes

1. Internal Capacity - *San Buenaventura HA*
2. Qualifying Portfolio’s - *Mercy Housing*
3. Collecting Baseline & Current Year Data
   - Collecting Tenant Data (Sampling) - *Cuyahoga HA*
   - Collecting AWBD - *Beacon Communities*
   - Using Estimated Data (52722 & EPC) – *Rockford HA*
4. Integrating Similar Data sets - *3rd Party Vendors*
5. Late & Delayed Data from Utilities - *Winn & FS Energy*
6. Renewables - *POAH*
7. Using/Understanding Data - *SAHF*
Release date is **Sunday, August 26, 2018** (2012 CBECS data)

Visit [www.energystar.gov/scoreupdates](http://www.energystar.gov/scoreupdates)

U.S. building stock is becoming more energy efficient, buildings will see, on average, a drop in their ENERGY STAR scores.

- Baseline EUIs will update
- Current year EUIs will update
- Existing certifications won’t be affected
- Current applications won’t be affected

**National electricity source energy factor:**
- Old is 3.14
- New is 2.80

Save your old Metrics –
- Run the “Performance Highlights” report
Roadmaps to 20% Savings

One Goal – Many Paths
Roadmap Tool

• Excel-based tool for quantifying your reduction target and plotting a set of paths to get there

• Available on the HUD Exchange website

• Free!
“You've got to be very careful if you don't know where you're going, because you might not get there.”

— Yogi Berra
Setting Your Reduction Target

Inputs
- Number of Units
- Square footage
- Baseline EUI and WUI (if available)
- Savings to date (if any)

Outputs
- Baseline consumption in MMBTU & Millions of Gallons
- Target MMBTU and Millions of Gallons to be saved
Work Plan Categories

- New Construction/ Major Rehab
- Retrofits (Deep, Medium, Light)
- Renewable Energy (Solar Thermal, PV)
- Resident Engagement (Basic, Intensive)
- Operations & Maintenance (Basic, Intensive)
### 1) Overall Workplan:

<table>
<thead>
<tr>
<th>Measure/Pathway</th>
<th>% of Units</th>
<th># Units</th>
<th>Energy Savings per Unit</th>
<th>Water Savings per Unit</th>
<th>Total MMBTU Saved</th>
<th>Total Water Savings (Million gallons/year)</th>
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<tbody>
<tr>
<td>Deep Efficiency at New Construction / Rehab</td>
<td>-</td>
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<td>40%</td>
<td>25%</td>
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<td>Deep Efficiency Discretionary Retrofit</td>
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<td>30%</td>
<td>20%</td>
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<td>15%</td>
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<td>Light Efficiency Discretionary Retrofit - Water</td>
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<td>25%</td>
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<td>Appliance Upgrade at Time of Purchase</td>
<td>-</td>
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<td>2%</td>
<td>0.8%</td>
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<td>Improved O&amp;M – basic level</td>
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<td>4%</td>
<td>2%</td>
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<tr>
<td>Improved O&amp;M / Retro-commissioning – intensive/R&amp;D effort</td>
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<td>15%</td>
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<td>Resident Engagement – basic level</td>
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<td>2%</td>
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<td>Resident Engagement – Intensive/R&amp;D effort</td>
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<td>Solar Domestic Hot Water</td>
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<td><strong>Additional savings needed to reach target</strong></td>
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Roadmap Participants Shout Out

- Angola Housing Authority
- Caritas Communities
- Foundation Communities
- Denver Housing Authority
- Helena Housing Authority
- Capitol Hill Housing
- The Silver Street Group, LLC
Many Pathways

- Improved O&M – basic
- Resident Engagement – basic
- Solar Thermal

New Construction / Rehab
- Light Retrofits
- Improved O&M – basic
- Resident Engagement – basic

Medium Retrofits
- Appliance Upgrades
- Improved O&M – intensive
- Resident Engagement – Intensive

contact@sahfnet.org
SAHF Member Work Plan Results

- Deep Eff. at NC/Rehab: 50% of Units, 40% of Savings
- Energy Retrofits: 20% of Units, 10% of Savings
- Appliance Upgrades: 30% of Units, 20% of Savings
- Improved O&M/Rx: 60% of Units, 50% of Savings
- Resident Engagement: 80% of Units, 70% of Savings
- Renewable Energy: 10% of Units, 9% of Savings

Legend:
- Green bar: % of Units
- Blue bar: % of Savings
Resources

• Better Buildings Solution Center:
  • https://betterbuildingsinitiative.energy.gov/solutions

• Resident Engagement:
  • http://www.sahfnet.org/our-work/energy-and-water-conservation/resident-engagement

• Operations and Maintenance
  • http://www.sahfnet.org/our-work/energy-and-water-conservation/operations-maintenance
Multifamily Sector Recognition
2018 Better Buildings Summit
New BBC MF Partners

- Boston Housing Authority
- Bozzuto Management
- Foundation Communities
- Highland Commercial Properties
- Kier Property Management
- Puerto Rico Public Housing Administration
- Stark Metropolitan Housing Authority

Total = 7 new partners since the 2017 Summit
BBC MF Partners that Published a Showcase Project

- AHEAD, Inc.
- Beacon Communities
- Commonbond Communities
- EAH Housing, Inc.
- Foundation Communities
- Houston Housing Authority
- Jamaica Plain Neighborhood Development Corporation
- Jonathan Rose Companies
- King County Housing Authority
- NHP Foundation
- Schochet Companies

- Tampa Housing Authority
- Tenderloin Neighborhood Development Corporation
- The Boston Land Company
- Village of Hempstead Housing Authority
- Wesley Housing Corporation
- Wishrock Investment Group

Total = 17 partners since the 2017 Summit
BBC MF Partners that Published an Implementation Model

- Housing Authority of the City of Palatka, FL
- Jersey City (NJ) Housing Authority
- New York City Housing Authority
- Preservation of Affordable Housing
- Rockford Housing Authority
- Tampa Housing Authority
- Trinity Management
- Village of Hempstead Housing Authority

Total = 8 partners since the 2017 Summit
BBC Multifamily Partners with Published Showcase Project AND Implementation Model

- Aeon
- Balfour Beatty Communities
- Corcoran Management
- Cuyahoga Metropolitan Housing Authority
- Jersey City Housing Authority
- LINC Housing Corporation
- Mercy Housing
- **New York City Housing Authority**
- NHT/Enterprise Preservation Corporation
- Preservation of Affordable Housing
- Rockford Housing Authority
- **Tampa Housing Authority**
- Tenderloin Neighborhood Development Corporation
- The Economic Development Authority of the City of Mankato, MN
- The Housing Authority of the City and County of Denver
- TH Real Estate (TIAA)
- The Tower Companies
- **Village of Hempstead Housing Authority**

**Bold** = Accomplished for first time since the 2017 Summit
Total = 18 partners
BBC Multifamily partners who shared a partial data display this year

- AHEAD, Inc.
- Beacon Communities
- BRIDGE Housing Corporation
- Caritas Communities, Inc.
- CommonBond Communities
- Corcoran Management
- East Bay Asian Local Development Corporation
- Fort Wayne Housing Authority
- Foundation Communities
- Housing Authority of the City of San Buenaventura, CA
- Jonathan Rose Companies
- Korman Residential Properties
- Lucas Metropolitan Housing Authority
- Mercy Housing
- National Church Residences
- NHP Foundation
- NHT/Enterprise Preservation Corporation
- Peabody Properties, Inc.
- Preservation of Affordable Housing
- Retirement Housing Foundation
- Rockford Housing Authority
- San Antonio Housing Authority
- Satellite Affordable Housing Associates
- Tampa Housing Authority
- Tenderloin Neighborhood Development Corporation
- The Community Builders
- The Evangelical Lutheran Good Samaritan Society
- The Silver Street Group and Housing Management Resources
- Trinity Management
- Utica Municipal Housing Authority
- Windsor Locks Housing Authority
- WinnCompanies
- Wishrock Investment Group

Total = 33
Bold = Published for the first time this year
BBC Multifamily partners who shared a full data display this year

- Atlanta Housing Authority
- Angola (IN) Housing Authority
- Cambridge, MA Housing Authority
- Capitol Hill Housing
- Cascap, Inc.
- **Cion Housing Services**
- **Cleveland Housing Authority**
- Danville Development
- Gateway Management Services, LLC
- Helena (MT) Housing Authority
- Palatka (FL) Housing Authority
- Jersey City (NJ) Housing Authority
- Jewish Community Housing for the Elderly
- Keene Housing
- King County Housing Authority
- Minneapolis Public Housing Authority
- New Bedford Housing Authority
- New York City Housing Authority
- Presby’s Inspired Life
- Schochet Companies
- The Economic Development Authority of the City of Mankato, MN
- The Housing Authority of the City and County of Denver
- The Renaissance Collaborative
- The Tower Companies
- TH Real Estate (TIAA)
- Trinity Housing Corporation of Greeley, Colorado
- Village of Hempstead Housing Authority
- Vistula Management Company
- Washington, DC Housing Authority

Total = 29 partners
**Bold** = Published for the first time this year
BBC Multifamily Goal Achiever

Has met the BBC goal of 20% reduction in portfolio-wide energy consumption, achieving 26% savings in six years.
Jersey City Housing Authority
Energy Performance Contract
Lighting and Water Efficiency
Holland Gardens – Solar Hot Water Heater
Booker T. Washington Apartments – Boiler Decentralization

Before

After