We’ll be starting in just a few minutes….

Tell us…

What topics are you interested in for future webinars?

Please go to slido.com and use event code #DOE to submit your responses.
Combining Energy + Health Upgrades in Multifamily Housing

July 21, 2020
1:00 – 2:30 pm EDT
Welcome

- Importance of healthy housing never been clearer:
  - Building more efficient homes, including passive house, with ACH down to almost zero
  - Spending more time in our homes than ever due to Covid-19.
  - Asthma and respiratory ailments identified as risk factor
- We need to be sure that when we rehab our homes, we maximize the indoor experience, minimize hazards.
A few examples

- **Asthma**: 8% adults and children have asthma AND 20-40% of asthma attacks can be linked to home conditions
- **Radon**: 21,000 annual deaths estimated, over 7 million homes with suspected risks
- **Falls**: 1 in 4 older adults fall each year, over 50% of falls occur in the home.
Agenda

1. Introduction to energy + health projects in affordable housing
2. Panelist presentations
3. Moderated discussion with panelists
4. Q & A
How energy efficiency can reduce health risks

- **Insulation**
- **Air Sealing**
  - Warmer drier air, improved indoor temperatures & relative humidity
  - Fewer heat or cold related deaths
  - Less hypertension, heart disease

- **Heating System Upgrades**
  - Less moisture, mold, particulates, pollutants, combustion by-products, allergens
  - Fewer asthma symptoms, respiratory risks, Chronic Obstructive Pulmonary Disease (COPD)
  - Fewer heart disease risks
  - Fewer cancer risks due to radon, formaldehyde, other sources

- **Ventilation**
- **Vent Dryers**
  - Lower bills, better comfort
  - Less stress, better mental health

- **Efficient Cooking Appliances**

Reduced hospital and medical visits
Environmental Exposures

- Inadequate ventilation*: 89% (Conventional) 27% (Green)
- Chemical exposure: 65% (Conventional) 61% (Green)
- Mold*: 31% (Conventional) 4% (Green)
- Secondhand smoke*: 31% (Conventional) 19% (Green)
- Pests*: 58% (Conventional) 20% (Green)
- Combustion byproducts*: 0% (Conventional) 82% (Green)
**Systematic review**

*Strong evidence of effectiveness - reducing symptom days, improving quality of life or symptom scores, and reducing the number of school days missed*

**Recommendations**

*Use home-based, multi-trigger, multi-component interventions with an environmental focus for children and adolescents with asthma*

**Return on Investment**

*Net positive returns on investment - Benefit/cost ratio from 5.3 to 14*

---

CDC Task Force, Findings and Rationale Statement Interventions for Children and Adolescents with Asthma, 2010

[http://www.thecommunityguide.org/asthma/rrchildren.html](http://www.thecommunityguide.org/asthma/rrchildren.html)
Health@Home Guidelines & Training Series

- Home conditions can contribute to health issues, including injuries, asthma and respiratory ailments, radon-induced lung cancer, and lead poisoning
- Rehab projects are an opportunity to address housing-based health issues
- Focuses on moderate rehabilitation, home remodeling, or home repair programs
- While broadly applicable, focus is on single-family and low-rise multifamily housing

<table>
<thead>
<tr>
<th>Overview and Keep it Well</th>
<th>June 18</th>
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<tbody>
<tr>
<td>Ventilated and Clean</td>
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<table>
<thead>
<tr>
<th>Keep it Contaminant and Pest Free</th>
<th>July 23</th>
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<tr>
<td>Keep it Dry and Safe</td>
<td>September 10</td>
</tr>
<tr>
<td>The Energy + Health Equation, Maintenance and Active Design</td>
<td>October 8</td>
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Today’s Session

- Innovative Strategies that:
  - Involve new partnerships and financing solutions
  - Target housing of those at most risk
  - Are cost effective and scalable to high-risk communities
  - Incentivize best practices in green and healthy housing maintenance
  - Incentivize healthy and active living in homes and communities
Please go to www.slido.com
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Enter Event Code

#DOE
Poll #1

Which of these healthy housing measures is most important to you in addressing health in your energy upgrade projects? **Choose up to three.**

- Indoor air quality, e.g. ventilation upgrades
- Mold/moisture mitigation
- Integrated pest management
- Reducing injuries, trips, and falls
- Healthy building materials
- Mitigate toxins (e.g. lead, radon)
- Well-being measures, e.g. ample outdoor spaces, physical fitness opportunities, natural lighting

Please go to [www.slido.com](http://www.slido.com) and enter code #DOE to respond
Today’s Presenters

Drew Vernalia  
Codman Square Neighborhood Development Corporation

Krista Egger  
Enterprise Community Partners

Neil Steinkamp  
Stout

Ruchi Shah  
Tenderloin Neighborhood Development Corporation

Roberto Valle Kinloch  
Healthy Building Network
Drew Vernalia
Codman Square Neighborhood Development Corporation

Submit Questions
www.slido.com event code #DOE
Planning Green and Healthy Housing, Development, and Communities

Codman Square Neighborhood Development Corporation

Drew Vernalia
Asset Manager
1. GREEN COMMUNITY & ORGANIZATION PLANS
   1.1 Strategic & Operating Plans
   1.2 Community Sustainability Plan

2. GREEN ASSET MANAGEMENT PLAN (GAMP)
   2.1 GAMP - Individual Property Plans
   2.2 GAMP - Combo Dashboard-Planner

3. GREEN DEVELOPMENT PLANNING
   3.1 Development & Construction Standards
   3.2 Health Action Plan
What do CDCs do to impact health as it relates to housing?
1. GREEN COMMUNITIES & ORGANIZATIONS

Promoting Healthy Living

Promoting Economic Prosperity

LEED FOR NEIGHBORHOOD DEVELOPMENT
1.1 Strategic & Operating Plans

Strategic Plan
Annual Operating Plan
Community Sustainability Plan
Have sustainability and health goals for all departments
## 1.2 Community Sustainability Plan

<table>
<thead>
<tr>
<th>REAL ESTATE DEVELOPMENT</th>
<th>HOUSING ASSET MANAGEMENT</th>
<th>ECO-INNOVATION DEPARTMENT/DISTRICT</th>
<th>ECONOMIC DEVELOPMENT</th>
<th>COMMUNITY ORGANIZING &amp; RESIDENT RESOURCES</th>
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<td><strong>CLIMATE IMPACT</strong></td>
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<tr>
<td>• LEED gold certification</td>
<td>• Track energy and CO2 reductions of retrofits</td>
<td>• Carbon footprint reduction</td>
<td>• Attract businesses that practice or are willing to practice green initiatives</td>
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<tr>
<td>• Heat island reduction</td>
<td>• Install white roofs for heat island reduction</td>
<td>• Residential deep energy retrofits –40% reduction</td>
<td>• Heat island reduction through community farms</td>
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<td>• Green roofs &amp;/or walls</td>
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<td>• NeighborWorks green organization process</td>
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<td><strong>ENERGY (Electrical and Heating)</strong></td>
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<tr>
<td>• Energy Star appliances</td>
<td>• Install solar</td>
<td>• 50% of EID homes retrofit</td>
<td>• Utilize trickle watering to reduce water use at community farms</td>
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<td>• Green certifications Solar financial feasibility analysis</td>
<td>• Boiler retrofits</td>
<td>• reduce individual and overall EID energy usage</td>
<td>• Composting on site</td>
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<tr>
<td>• Solar financial feasibility analysis</td>
<td>• LED light fixtures</td>
<td>• Monitor and report on energy use</td>
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<tr>
<td>• Complete water conservation measures (20% reductions)</td>
<td>• Monitor and report on energy use</td>
<td>• Opportunities for green roofs, green walls, etc.</td>
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<td>• Install low flow fixtures</td>
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<td>• Green infrastructure projects</td>
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<td>• Install cisterns or rain barrels</td>
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<td>• Train station collaborative work</td>
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<tr>
<td><strong>WATER</strong></td>
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<td>• 20% less water use in new construction</td>
<td>• Single stream recycling</td>
<td>• Identify opportunities to recycle and reduce EID waste by 20% by 2020</td>
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<tr>
<td>• Use low flow fixtures</td>
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<td>• Minimize site hardscape and related runoff</td>
<td>• Recycling reporting</td>
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<td>• Complete water conservation measures (20% reductions)</td>
<td>• Green procurement policies</td>
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<td>• Install low flow fixtures</td>
<td>• Install cisterns or rain barrels</td>
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<tr>
<td><strong>WASTE</strong></td>
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<tr>
<td>• Construction waste reduction</td>
<td>• Single stream recycling</td>
<td>• Identify opportunities to recycle and reduce EID waste by 20% by 2020</td>
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<tr>
<td>• Use recycled materials in new construction</td>
<td>• Recycling reporting</td>
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<tr>
<td>• Single stream recycling</td>
<td>• Recycling reporting</td>
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<tr>
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<td>• Green procurement policies</td>
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<tr>
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<td><strong>MOBILITY &amp; HEALTH</strong></td>
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<tr>
<td>• Bring mobility and health related improvements</td>
<td>• Provide more bike storage</td>
<td>• Promote green/healthy transportation through increasing amenities, residence engagement and improving area walk/bike wayfinding system</td>
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<td>• Reduce number of cars affiliated with future developments</td>
<td>• Improve indoor air quality</td>
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<tr>
<td>• Provide more bike storage</td>
<td>• Accessibility compliant</td>
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<tr>
<td>• Improve indoor air quality</td>
<td>• Train station collaborative work</td>
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<tr>
<td>• Accessibility compliant</td>
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## 1.2 Community Sustainability Plan

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<tr>
<th>BUILT ENVIRONMENT</th>
<th>REAL ESTATE DEVELOPMENT</th>
<th>HOUSING ASSET MANAGEMENT</th>
<th>ECO-INNOVATION DEPARTMENT/DISTRICT</th>
<th>ECONOMIC DEVELOPMENT</th>
<th>COMMUNITY ORGANIZING &amp; RESIDENT RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECOSYSTEMS</strong></td>
<td>• Increase plantings to attract wildlife and create public fruit opportunities &lt;br&gt;• Green roof &lt;br&gt;• Reduce impervious surface</td>
<td>• Increase plantings to attract wildlife and create public fruit opportunities &lt;br&gt;Green roof &lt;br&gt;Reduce impervious surface</td>
<td>• Create green infrastructure project along NE Ave that also incorporates solar lighting and seating areas &lt;br&gt;• Create plan to offer virtually net metered electricity credits</td>
<td></td>
<td>• Landscape/planting plan at community farms that includes plants that attract bees, butterflies and other pollinating insects</td>
</tr>
<tr>
<td><strong>FOOD &amp; HEALTH</strong></td>
<td>• Create green roof or green wall that can supply fresh fruits and/or vegetables to residents and/or passersby &lt;br&gt;• Plant fruit trees/orchard &lt;br&gt;• Create green roof or green wall that can supply fresh fruits and/or vegetables to residents and/or passersby</td>
<td>• ID systems and appropriate plants for green walls/roofs &lt;br&gt;Pursue funding for community farms</td>
<td></td>
<td></td>
<td>• Provide healthy organic food for area residents and local restaurants &lt;br&gt;• Increase amount of this food</td>
</tr>
<tr>
<td><strong>INNOVATION ECONOMY AND JOBS</strong></td>
<td>• Create innovative jobs through RED project designs and construction</td>
<td>• Continue to attract new green MBE/WBE commercial tenants &lt;br&gt;• Support econ in creating innovation economy jobs</td>
<td>• Create jobs from projects &lt;br&gt;Continue to ID green, innovating, job-creating tenants for EID</td>
<td>• Continue to provide community farm jobs during the 2016 growing season</td>
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</tr>
<tr>
<td><strong>EQUITY AND LIVABILITY</strong></td>
<td>• Continue to create affordable rental and homeownership housing opportunities</td>
<td>• Ensure continued support of residents training in green living and green building features and conservation practices</td>
<td>• Support community residents by helping residents lower their energy costs via CSS and energy retrofits</td>
<td></td>
<td>• Continue to inform residents about opportunities for green jobs and to comment on topics and issues</td>
</tr>
</tbody>
</table>
2. GREEN ASSET MANAGEMENT PLAN (GAMP) and how to do it.

- Skylights
- Light sensors
- Solar panels
- Recreation/playground
- Garden
- Boiler retrofits
2.1 GAMP - Individual Property Plan

Example Property Abstract - Washington Columbia II

**Background:** Washington Columbia II, renovated in 1992, consists of 175 low income apartment units in 16 brick buildings.

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>GREEN PRACTICES IN PLACE</th>
<th>GREEN PRACTICES PLANNED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment and Accountability</td>
<td>Obtain organizational commitment. Hold recurring meetings to plan, implement and monitor GAMP. Entered Better Buildings Challenge</td>
<td>Complete 20% property energy usage reduction, 15% reduction in utility spending; WegoWise Certifications</td>
</tr>
<tr>
<td>Climate Impact</td>
<td>Track energy usage and CO₂ emissions using WegoWise</td>
<td>reduce CO₂ emissions at property and across CSNDC’s portfolio</td>
</tr>
<tr>
<td>Energy - Electric</td>
<td>Installed light timers in all non-unit spaces Energy Star Appliances; 2016 White roofing; 2016: LED Common area and unit lighting retrofits, Resident LED bulbs</td>
<td>2017: Install solar PV panels at all buildings for community shared solar; High efficiency pumps</td>
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<tr>
<td>Energy - Heating</td>
<td>2015-2016: High efficiency heat and HW boilers; Targeting 130 BTU/SF/Day</td>
<td>2017: install boiler monitoring equipment; Weather-stripping, pipe and roof insulation retrofits; more energy efficient windows at refinance</td>
</tr>
<tr>
<td>Water</td>
<td>Low flow bathroom plumbing; Targeting 75 Gal/BR/Day water usage; 2016 new washers</td>
<td>Lower flow fixtures and toilets, Rain Barrels and/or Rain Gardens</td>
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<tr>
<td>Waste</td>
<td>Recycling, Installing “Green Flooring”; VCT throughout the building</td>
<td>More recycled building materials (counters)</td>
</tr>
<tr>
<td>Mobility, Health, and Food</td>
<td>Smoke free, Integrated Pest Management, Green Cleaning, Green Turnover checklist, Low VOC paint and products, Green &amp; Healthy Building Guide; Resident exercise programs; Resident Garden</td>
<td>Promote walking and bicycle use, Add bicycle storage, Add Fruit Trees to leisure area</td>
</tr>
<tr>
<td>Built Environment</td>
<td>Leisure area, playground, solar panels</td>
<td>Consider green façade/walls</td>
</tr>
<tr>
<td>Ecosystems</td>
<td>Maintain well established trees and garden</td>
<td>Increase the number of trees, shrubs, wildlife attracting plants and public fruit opportunities (Columbia Road)</td>
</tr>
<tr>
<td>Innovation Economy &amp; Jobs</td>
<td>Onsite Computer Learning Center teaches computer skills, employment training, youth and adult classes; Start FSS program</td>
<td>Create Economic Opportunity Center for employment and entrepreneur training; Create innovation economy jobs</td>
</tr>
<tr>
<td>Equity and Livability</td>
<td>Ensure continued support of residents; Resident meetings; Implemented resident handbook with green guide</td>
<td>2017 add hallway art; Consider easy clean apartment features at refinance</td>
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# 2.2 GAMP - Combo Dashboard-Planner

Dashboard: Energy & Retrofit Planner

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<td>47.9</td>
<td></td>
<td>14.9</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Girls Latin II</td>
<td>45 Centre St</td>
<td>2.71</td>
<td>25.6</td>
<td></td>
<td>14.9</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>New Glencoe Aptts</td>
<td>7 Copen Street</td>
<td>0.92</td>
<td>47.9</td>
<td></td>
<td>14.9</td>
<td></td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>
3. GREEN DEVELOPMENT PLANNING

**Waldeck**

- Supportive housing for homeless and high users of medical services
- Intensive in-home case management, recovery supports, and mobile medical
- Boston Medical Center
- Enterprise Communities
- Boston Public Health Commission
3.1 Development & Construction Standards

- **Planning / Team**: Asset and Property Management Early Involvement and Design Review
- **Circulation**: Efficient Circulation Design for Both Residents and Management
- **Site Selection**: Smart Site Selection with Close Connection to Public Transport and Amenities
- **Unit Design**: In-unit Layout Design and Fixture and Appliance Selection to Meet Occupants' Needs and Wellness.
- **Massing**: Responsible Building Mass and Place Creation
- **Systems**: CSNDC Standards for Building Energy, Water, Mechanical, And Ventilation; Interior And Exterior Systems requirements
- **Building Programs**: Providing Public Programs and Amenities for Community wellbeing
- **Materials**: Material Selection to Protect Public Health and Promote Environmental Sustainability
- **Landscape**: Incorporating landscape design in the creation of green indoor or outdoor space
- **Culture**: Leverage Design to Connect with Local Culture And Create a Sense of Identity
3.2 Health Action Plan

### Key Health Issues

- **Trouble Sleeping**
  - Enhance the sense of safety by deterring crime
  - Increase the comfort of residents by decreasing ambient noise levels
  - Ensure residents are not exposed to asthmagens, carcinogens, or mold
  - Improve ventilation to the units

- **Air Quality**
  - Make the buildings feel more "homey"
  - Address feelings of isolation by increasing social cohesion
  - Making services available for residents

- **Thermal Comfort**
  - Improve heated system and enable A/C units
  - Increase access to sunlight and nature
  - Prevent injury and enhance accessibility
  - Enhance fire safety systems

- **Mental Health Issues**
  - Address feelings of isolation by increasing social cohesion
  - Making services available for residents
  - Increasing access to sunlight and nature

- **Fire And Life Safety**
  - Prevent injury and enhance accessibility
  - Enhance fire safety systems

### Selected Interventions

- **Selected Strategies**
  - Analyzing locks
  - Gate safety standard
  - Window replacement
  - Wall insulation
  - Material review
  - Seal and repair building envelope
  - Provide outside air ducted to all rooms
  - Additional A/C capable plugs
  - New heating system/thermostat
  - New interior design features
  - Individualized entry door
  - Create common spaces
  - Provide services office
  - Regular meetings
  - Improve/enhance greenery
  - Provide access to daylight
  - Pavement maintenance
  - Well-lit and safe egress routes
  - Install fire protection equipment

### Performance Metrics

- **Design Metrics**
- **Operations Metrics**
- **Health Metrics**
Contact

Drew Vernalia, CPM, Asset Manager
Codman Square Neighborhood Development Corp.
Drew@CSNDC.com
LinkedIn - https://www.linkedin.com/in/realestatedirector
Krista Egger
Enterprise Community Partners

Submit Questions
www.slido.com event code #DOE
Community Stakeholder Involvement

- Lift up health concerns not apparent in data.
- Tailor strategies to the specific cultural, accessibility, and other needs of the residents.
- Build relationships.
- Build power and agency for residents.
- Stronger uptake on the interventions.
Cross-Sector Partnerships

Developer
- Connection to Residents
- Feasibility
- Costs
- Experience with other developments

Public Health Professional
- Public health data
- Community engagement around health and solutions
- Evidence-based public health solutions
1 DEVELOP A HEALTH ACTION PLAN

COMMIT to embedding health into the project life cycle, including design, construction and operation.

COLLECT & ANALYZE community health data by using existing data sources, new qualitative research and/or public meetings to understand how this information can influence design.

PARTNER with public health professionals who have expertise in public health and/or community health to assist with data collection, community, engagement and future monitoring of outcomes.

ENGAGE community stakeholders to prioritize health needs by outlining health issues of the resident population to maximize health outcomes and receive input on strategies for addressing health needs.

IDENTIFY design and intervention strategies that can be implemented within the project’s design, construction or operation to address the prioritized health needs of the community.

2 IMPLEMENT & MONITOR

SELECT which strategies will be implemented and identify how it will be implemented, including who is responsible for implementation.

MONITOR the impact of the Health Action Plan by developing a monitoring plan that includes identification of performance metrics and parties responsible for collection.
Equity & Loan Funds

Housing for Health Fund: a partnership with Kaiser Permanente – which invested $15 million and will match up to $35 million in additional funds to be raised by Enterprise. Potentially totaling $85 million, the fund will serve more than a dozen Bay Area counties, with half of the capital designated to promote health and preserve affordable homes in the city of Oakland.

RxFund: a $100 million national loan fund that includes a $50 million loan from Kaiser Permanente to Enterprise Community Loan Fund, plus an additional $50 million in capital from Loan Fund over the next decade to create and preserve 3,250 affordable homes in Kaiser Permanente’s nationwide service areas.
<table>
<thead>
<tr>
<th>Injury and accessibility</th>
<th>Asthma and respiratory health</th>
<th>Chronic diseases (obesity, diabetes, cardiovascular diseases)</th>
<th>Cancer and toxin exposure</th>
<th>Mental health, trauma, and healing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical accessibility of the site and building</td>
<td>Indoor air quality, humidity, and temperature (central air, AC, ventilation)</td>
<td>Proximity to essential goods and services</td>
<td>Material selection</td>
<td>Views of nature</td>
</tr>
<tr>
<td>Safety and access points for mobility (walking, biking, transit)</td>
<td>Controlling for mold</td>
<td>Proximity and access to public transportation</td>
<td>Exposure to toxins through site selection and products used</td>
<td>Noise levels</td>
</tr>
<tr>
<td>Access to health and community services and supports</td>
<td>Use of toxic / carcinogenic products</td>
<td>Indoor air quality, humidity, and temperature (central air, AC, ventilation)</td>
<td>Indoor and outdoor water quality testing and control</td>
<td>Opportunity for social connection</td>
</tr>
<tr>
<td>Fall prevention features (stair gates, window guards, handrails, grab bars, flooring, and improved lighting)</td>
<td>Smoke-free policies</td>
<td>Access to safe, affordable places to be active</td>
<td>Indoor air quality, humidity, and temperature (central air, AC, ventilation)</td>
<td>Natural light</td>
</tr>
<tr>
<td>Access to affordable transportation services</td>
<td>Pests mitigation</td>
<td>Smoke-free policies</td>
<td>Access to safe, affordable places to be active</td>
<td>Promotion real and perceived safety</td>
</tr>
<tr>
<td>Appropriate lighting for household tasks and movement</td>
<td>Site selection</td>
<td>Proximity and access to affordable, healthy food</td>
<td>Proximity and access to affordable, healthy food</td>
<td>Flexible spaces</td>
</tr>
<tr>
<td>Methods of wayfinding</td>
<td>Material selection</td>
<td>Walkability, pathways, stairs</td>
<td>Smoke-free policies</td>
<td>Integration of art, culture, and history</td>
</tr>
<tr>
<td>Access to affordable transportation services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Key Take-Aways from Pilot:

- Verify opportunity for impact prior to making strategy recommendations
- Many strategies draw on assets in the community (farmers market, health campaigns with local partners)
- Developers gained a deepened understanding of opportunity for impact
- Low to high cost strategies (e.g. mile markers or no smoking policy to public bike share cards)
Pilot Impact

• Health is prioritized within the development.
• Residents experience a building that is designed, operated, and maintained to positively impact their health needs.
• Contributes to strong relationships between public health professionals, developers, and the community.
• Alignment with non-profit developers mission and builds their reputation.
• Reduced turnover in units and improvements in care of units and maintenance needs.
Partnerships

- Community Development Organization
- Residents
- Community Members
- Designer
- Public Health Professional
Measuring Impact

- Design Metrics
- Operations Metrics
- Resident Health Metrics

**Healthy Homes Outcomes Survey**
- Resident Stability
- Resident Satisfaction
- Health: Well-being & Quality of Life
- Health: Healthy Behaviors
- Health: Assessment of Outcomes
- Respondent Demographics
More Information

Health Action Plans
www.enterprisecommunity.org/healthactionplan

CityScape evaluation
https://bit.ly/2zTaARu
New York City Housing Authority ("NYCHA") is the largest public housing authority in the United States and its developments house over 500,000 New Yorkers – approximately the size of the entire population of Boston or Miami.

NYCHA manages over 300 developments with nearly 175,000 apartments in all five boroughs.

NYCHA created nearly 35,000 mold work orders in 2019. 99% of Mold Busters work orders require complex remediation.

NYCHA created nearly 290,000 leak work orders in 2019. 25% of Leak work orders require complex remediation.
Pillars of The Mold Busters Standard Procedure

- Rigorous Standard Inspection
- Consistent Remediation Process
- Quality Assurance, Oversight and Accountability
Reduction of Recurrence Using Mold Busters
Inspection Equipment

Courtesy of MicroEcologies, Inc.
Starting an Inspection Work Order

Courtesy of MicroEcologies, Inc.
Evaluation of Mold Growth

* Is there mold growth? (None)
* Is there Water Damage? (None)

Is Moisture Measurement > or equal to 599? (None)

Courtesy of MicroEcologies, Inc.
Evaluation of Water Damage Conditions

Courtesy of MicroEcologies, Inc.
Evaluation of Moisture Conditions

Courtesy of MicroEcologies, Inc.
Identify Probable Root-Cause and Necessary Repair/Remediation Work

No Probable Cause and Remediation has been selected for the following areas: Floor, Wall 1 (Near), Wall 2 (Left). Please select probable cause and remediation for all areas.

* Is wall break required? (None)
  - Bathtub/Shower
  - Caulking
  - Exterior Wall (Winter)
  - Facade
  - Gouging
  - Pipe Insulation
  - Leak – above/beside investigate
  - Plumbing – in unit

Select Response: None (Optional)

Courtesy of MicroEcologies, Inc.
Conducting Wall-Breaks to Identify Root-Cause

Courtesy of MicroEcologies, Inc.
Submit The Inspection Work Order
The work on ALL the auto-generated Child Work Orders must be completed and closed. Maximo then waits 25-days to auto-generate the QA Work Order.

1. Once the Inspection Work Order is Submitted, Maximo will auto-generate multiple Child Work Orders needed from this Inspection. In our scenario, there are 27 Child Work Orders Generated.

2. The work on ALL the auto-generated Child Work Orders must be completed and closed. Maximo then waits 25-days to auto-generate the QA Work Order.
Insight From Implementation of the Mold Busters Standard Procedure

- The importance of both organizational culture and effective, iterative strategy
- Use of data to aid investigations, dialogue and remediation
- The importance of a Quality Assurance check at the end of the remediation process
- Managing and overcoming scheduling and resource constraints
- The need for continuous evaluation of data controls (e.g., unfounded work orders)
- The need for oversight, accountability and retraining (continuous)
## Costs and Benefits of Mold Busters Standard Procedure

### Cost Elements

- Data system evaluation
- Current mold remediation evaluation
- Conforming remediation strategy and process mapping to Mold Busters protocol
- App development and integration
- Data platform for tracking progress and opportunities for change
- Implementation and evaluation costs
- Training of trainers
- Detection tools and mobile devices for staff

### Economic Benefits

- Reduction of future building repairs
- Reduced levels of recurrence
- Reduction of staffing (or vendor) resources due to a reduction of work orders
- Reduction of material costs due to a reduction of work orders
- Reduction of oversight and management cost due to data system identifications of deviations from standard procedures
- Reduction of housing litigation costs associated with mold
- Increased efficiency of resources
- Reduced rates of asthma, other health impacts and other tenant impact (e.g., employment)
Questions?

Contact: Neil Steinkamp
Independent Data Analyst – Baez v. NYCHA

Neil Steinkamp
Managing Director
Stout Risius Ross, LLC
120 West 45th Street, Suite 2900, New York, NY 10036
D +1.646.807.4229 | M +1.646.455.9430
nsteinkamp@stout.com
Submit Questions
www.slido.com event code #DOE
TNDC at a Glance!

**AT TNDC, WE BELIEVE HOUSING IS A HUMAN RIGHT.**

Every day we provide people who are struggling to make ends meet in San Francisco with permanently affordable homes. Because when a person has a place to call home, they have the foundation for a better life.

- **4,100** residents
  - 3,280 of our 4,100 residents live on an annual income of less than $15,000
  - 725 of our 3,450 homes are dedicated to the formerly homeless

- **3,450** homes
  - 725 of our 3,450 homes are dedicated to the formerly homeless

**56,000+ HOURS**

Our onsite social workers dedicate 56,000+ hours a year to helping residents feel welcome and supported in their home.

**BUILDING HOMES AND COMMUNITY IN SAN FRANCISCO FOR OVER 35 YEARS**

Our work began with a need for permanent affordable housing in the Tenderloin. As the need for more permanent affordable housing has grown, so have we.

- **43 BUILDINGS**
- **11 BUILDINGS IN DEVELOPMENT**
- **8 SF NEIGHBORHOODS**

**HOUSING COMES FIRST, IT'S NOT WHERE OUR WORK ENDS**

Our work is grounded in our community’s needs and leads to programs such as:

- **TENDERLOIN AFTER-SCHOOL PROGRAM**
  - 240 kids (ages 7-18) learn and grow with free tutoring, cultural activities, and an annual College Tour program

- **TENDERLOIN PEOPLE’S GARDEN**
  - 3,000 lbs of free produce are distributed to Tenderloin residents every year to lessen the burden of food costs
Sustainability Goals

1. TNDC has committed to **reducing 20% of energy and water use by 2029** as part of the national Better Buildings Challenge compared to a 2019 baseline.

2. TNDC has committed to **increasing waste diversion to 60% by volume by 2029** to a 2019 baseline.

3. TNDC has committed to **reducing combined Scope 1 & 2 emissions by 50% by 2028** compared to a 2019 baseline.

4. Every new **TNDC development will have Solar PV**, unless not feasible due to shading issues.

5. Every new **TNDC development will have a nationally recognized Green Certification** - at least **GreenPoint Rated Platinum** or **LEED Gold** and will consider occupant health-based design approaches such as FitWel and WELL.
TNDC is a HomeFree partner - a national initiative supporting affordable housing developers and committed to improving health by using less toxic, and healthy building materials.

TNDC is actively looking for ways to reduce embodied carbon emissions and piloting approaches in new construction developments. Key focus areas for impact reduction are concrete, steel, wood, and insulation.
Opportunities

- Bring health equity to over 5,000 residents
- Shape building material choices
- Engage stakeholders to transform
  - Facilities
  - Design and development
  - Architects
Green and Healthy Building Standards

Baseline

Aspirational but Adoptable

“UP” Basis of Design
A building certification system that sets standards for design features and operational strategies that support the health and wellness of building occupants.

Offers 70+ evidence-based design across 7 categories.

Operational strategies to optimize the health promoting impact of multifamily housing.

Registration fee: $500
Certification fee: $5,500 - $10,000 (depending on building size)

No prerequisite or barrier to entry

One-star (90-104 points)
Two-stars (105-124 points)
Three-stars (125-144 points)

Qualifying properties will receive up to a 15-basis point discount.
FitWel Pilot – 681 Florida

130 units
FitWel Pilot – 681 Florida

Excepted 1 Star rating

Conduct regular water quality testing
Water quality testing can reduce exposure to pathogens and contaminants found in water, reducing rates of disease and prevention adverse health effects.

Establish and implement a healthy food and beverage policy as rigorous as the Fitwel Food Services Standard at a prepared food area
A healthy food and beverage policy can increase access to healthy foods, offering nutritional benefits to occupants and protecting against the development of chronic disease.

Provide regular occupants access to an outdoor fitness area
An outdoor fitness area increases opportunities for regular exercise, contributing to increased physical activity.

Locate a transit stop within 1/2 mile or 800 meters of a main building entrance
Proximity to transit is positively associated with public transportation use, contributing to increased physical activity, stress reduction, improved air quality, community health, equity for those who cannot drive or afford private vehicle use, and enhanced access to amenities.

Provide a universally accessible pedestrian route between the main building entrance and amenities
A universally accessible pedestrian route connecting transit and a building entrance protects pedestrians from vehicular traffic and improves the walkability of the area, contributing to increased daily physical activity.

Provide regular occupants access to bicycle parking
Short-term bicycle parking encourages the use of bicycles for transportation and recreation, contributing to increased physical activity.

Provide regular occupants access to long-term bicycle parking
Providing secure and covered long-term bicycle parking encourages the use of bicycles for transportation and recreation, contributing to increased physical activity.
Healthy Building Materials

- **Red List Free**: Materials contain chemicals that have been designated harmful to humans and the environment.
- **Cradle to Cradle**: Products are assessed for environmental and social performance.
- **HomeFree**: Materials are ranked on a simplified spectrum based on common material content and health hazard.
- **GREENGUARD Certified**: Products are scientifically proven to meet the world’s most rigorous chemical emissions standards.
- **Healthy Materials Lab**: Materials are evaluated holistically for its contents, impact, and performance.
- **CARBON SMART MATERIALS PALETTE**: Contains attribute-based approach to embodied carbon reductions in the built environment.
### Traffic Light Chart Approach

#### Example

**Division 07**

**SUSTAINABILITY APPENDIX**

Vetted by DBA, Mithun, HBN

Validated by relevant certifications and databases

<table>
<thead>
<tr>
<th>HBN's HOMEFREE INSULATION HAZARD SPECTRUM (see the HomeFree website for additional information)</th>
<th>TNDC RECOMMENDED BRANDS &amp; PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expanded Cork</strong></td>
<td>1. Amoim Insulation, Thermocork Standard Insulation</td>
</tr>
<tr>
<td><strong>Blown-In Fiberglass</strong> (Loose Fill, Dense Pack, and Spray-Applied)</td>
<td>1. Knauf Insulation, Jet Stream Ultra and Max</td>
</tr>
<tr>
<td></td>
<td>2. CertainTeed, InsulSafe SP Premium Blowing Wool and TrueComfort</td>
</tr>
<tr>
<td></td>
<td>3. Owens Corning, TrueComfort Blown-in Fiberglass</td>
</tr>
<tr>
<td><strong>Kraft-Faced and Unfaced Fiberglass Batt</strong></td>
<td>1. Knauf Insulation, Ecobatt</td>
</tr>
<tr>
<td></td>
<td>2. CertainTeed, CertaPro</td>
</tr>
<tr>
<td></td>
<td>3. Owens Corning, EcoTouch Pink Fiberglass Batt Insulation with PureFiber Technology</td>
</tr>
<tr>
<td><strong>Formaldehyde-Free Mineral Wool Batt</strong></td>
<td>1. Rockwool AFB EVO</td>
</tr>
<tr>
<td></td>
<td>2. Owens Corning, Thermafiber Mineral Wool Insulation Formaldehyde-Free</td>
</tr>
<tr>
<td><strong>Halogen-Free Polysiocyanurate</strong></td>
<td>1. GAF, EnergyGuard™ NH</td>
</tr>
<tr>
<td></td>
<td>2. Johns Manville ENERGY 3.E</td>
</tr>
<tr>
<td></td>
<td>3. Carlisle, VersiCore MP-H NH Polyiso (Rigid roof insulation panel)</td>
</tr>
<tr>
<td><strong>Unfaced Cellulose/Cotton Batt</strong></td>
<td>1. Bonded Logic, UltraTouch</td>
</tr>
<tr>
<td></td>
<td>2. Black Mountain, Sheep Wool</td>
</tr>
<tr>
<td></td>
<td>3. Havelock Wool, Woolbatt Insulation</td>
</tr>
<tr>
<td></td>
<td>4. Bonded Logic, UltraLiner Sound Blanket (Acoustics)</td>
</tr>
<tr>
<td><strong>Blown-in Cellulose</strong> (Loose fill, dense pack, and wet-blown)</td>
<td>1. Insulation Manufacturing, Polar Barrier Loose Fill</td>
</tr>
<tr>
<td></td>
<td>2. US Greenfiber LLC, Cellulose Fiber Insulation</td>
</tr>
<tr>
<td><strong>PSK or FSK-Faced Fiberglass Batt or Blankets</strong></td>
<td>1. CertainTeed, CertaPro Thermal Extended Flange Batt - FSK Faced</td>
</tr>
<tr>
<td></td>
<td>2. CertainTeed FiberGlass Insulation White PSK Faced Roll</td>
</tr>
<tr>
<td></td>
<td>3. Johns Manville, FSK &amp; PSK Faced FiberGlass Insulation Batts</td>
</tr>
<tr>
<td></td>
<td>4. Knauf, Basement Wall Insulation with ECOSE Technology</td>
</tr>
<tr>
<td><strong>Mineral Wool Boards</strong> (meeting CDPH)</td>
<td>1. Knauf, Earthwool Insulation Board with ECOSE Technology</td>
</tr>
<tr>
<td><strong>Fiberglass Board (Duct Insulation, unfaced)</strong></td>
<td>1. InsulFoam</td>
</tr>
<tr>
<td></td>
<td>2. BASF, Neopor Expandable Polystyrene</td>
</tr>
<tr>
<td><strong>Expanded Polystyrene (EPS)</strong></td>
<td>1. Owens Corning, FOAMULAR Extruded Polystyrene</td>
</tr>
<tr>
<td></td>
<td>2. Dow/DuPont Styrofoam XPS</td>
</tr>
<tr>
<td></td>
<td>3. Dow, XENERGY IB LSP</td>
</tr>
<tr>
<td><strong>Spray Polyurethane Foam (SPF)</strong></td>
<td>1. Owens Corning, FOAMULAR Extruded Polystyrene</td>
</tr>
</tbody>
</table>

Need more product options? Refer here: [https://buildingclad.org/building/products/insulation](https://buildingclad.org/building/products/insulation)
Thank You!

Ruchi Shah, Senior Sustainability Manager

rshah@tndc.org

“I don’t want your hope. I don’t want you to be hopeful. I want you to panic … and act as if the house was on fire. ”

Greta Thunberg
Environmental Activist
Roberto Valle Kinloch
Healthy Building Network

Submit Questions
www.slido.com event code #DOE
Roberto Valle Kinloch
HomeFree Manager
July 21, 2020
1. Context: What’s missing?

- Energy & water efficiency
- Responsible sourcing
- Renewable energy
- Low-impact operations
- Products
  - Toxic chemicals & life cycles
2. Impact: The connection between health, energy and climate
### 3. Partnerships: Understanding and scaling best-practice

<table>
<thead>
<tr>
<th>NRDC</th>
<th>ENERGY EFFICIENCY FOR ALL</th>
<th>Reports – Improve understanding Action-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Material spec. review guideline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&amp; Material spec.</td>
</tr>
<tr>
<td></td>
<td>Tenderloin Neighborhood Development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterprise green communities®</td>
<td>Enterprise Green Communities Criteria 2020</td>
</tr>
</tbody>
</table>

6.4 Mandatory and Optional | 15 points maximum

**Healthier Material Selection**
4. Tools & resources: Enabling better decision-making

Hazard Spectrum

Courses

Case Studies

Reports & other

Webinars
Things you can do now!

1. Visit us
2. Learn & apply
3. Share with peers & give us feedback

rvalle@healthybuilding.net
healthybuilding.net
homefree.healthybuilding.net
Poll #2

What barriers do you face in incorporating healthy housing measures into your energy retrofit projects?

E.g. financing, lack of information, resistance from leadership, resident engagement

Please go to www.slido.com and enter code #DOE to respond
Discussion with Panelists

Submit Questions
www.slido.com event code #DOE
**Overview**

- **Immediate Actions - Examples**
  - Inform/encourage residents on social distancing/masks in common spaces
  - Assist residents with covering/sealing vents in rooms with infected or higher-risk patients
  - Portable air cleaners with HEPA filters or UV disinfection in common spaces
  - Install high efficiency MERV 13 filters in central systems and dwelling units.
  - Operate installed UVGI devices if present (only applies to systems installed in HVAC ducts)

- **Longer Term Upgrades - Examples**
  - Install or upgrade ventilation systems (bathrooms/toilets and public areas)
  - Consider permanent upgrade of filtration efficiency for systems serving public areas (MERV 13/ASHRAE 52.2)
  - Minimize transfer air between dwelling units, unit and corridors, units and common

- **Resident Education - Examples**
  - Provide instructions/demonstrations on correct use of building mechanical and passive ventilation systems
  - If building equipped with ventilation system, ask residents to open windows as little as possible
  - If residents maintain own systems, recommend upgrading filters to MERV 13 (ASHRAE 52.2)

ASHRAE Guidance provided for informational purposes only, not specifically recommended or endorsed by HUD. See [https://www.ashrae.org/technical-resources/multifamily-buildings](https://www.ashrae.org/technical-resources/multifamily-buildings)
Covid-19 Multifamily Resources

- **ASHRAE**
  https://www.ashrae.org/technical-resources/multifamily-buildings

- **AIA**
  https://www.aia.org/resources/6307024-reopening-america-strategies-for-safer-sen

- **CDC**

- **HUD Exchange/Better Buildings Challenge**
  https://www.hudexchange.info/programs/better-buildings-challenge/covid-19/#covid-19-resources
Q & A

Submit Questions
www.slido.com event code #DOE
Discover online training and education opportunities from the U.S. Department of Energy (DOE) and Better Buildings Affiliates who are working with DOE to promote energy efficiency in U.S. buildings and manufacturing plants.

Learn more at: [https://betterbuildingssolutioncenter.energy.gov/e-learning-center](https://betterbuildingssolutioncenter.energy.gov/e-learning-center)
Better Buildings: Summer Webinar Series

**Behind the Meter**

**Distributed Energy Resources:**
Best Practices for Integrating DERS into Commercial Buildings

*July 8*

**Next-Generation Building Performance Policies:**
Maximizing Energy Savings and Environmental Impacts

*July 16*

**Everyone Has a Data Center:**
How to Be an Energy Champion for Yours

*July 28*

**Program Design with Everyone in Mind:**
Low-Income Solar Program Strategies

*July 9*

**Strategies to Combine Energy + Health Upgrades in Multifamily Housing**

*July 21*

**Case in Point:**
Oregon’s Recent Efforts to Reduce Plug Load Energy Consumption

*July 22*

**The Dynamic Duo:**
Unleash Public Sector Energy Savings with Financing and Technical Assistance

*July 14*

**On-Demand Webinars**

**Register Today**
Additional Resources

• Better Buildings Challenge Multifamily Sector Homepage
  • https://www.hudexchange.info/programs/better-buildings-challenge/

• ASHRAE
  • https://www.ashrae.org/technical-resources/multifamily-buildings

• Building Performance Institute’s Healthy Housing Principles Guide
  • www.bpi.org/healthy-housing-principles

• Enterprise Health Action Plan
  • www.enterprisecommunity.org/healthactionplan
Join DOE’s Plug and Process Load Technology Research Team for a technical presentation about a statewide plug load strategy developed by the Oregon Department of Administrative Services and the Oregon Department of Energy. Presenters will also discuss the state’s adoption of ASHRAE 90.1-2016 energy codes and Oregon’s Energy and Resource Conservation Policy, which directs agencies to implement several components of the plug load strategy.
BETTER BUILDINGS

Better Buildings is an initiative of the U.S. Department of Energy (DOE) designed to improve the lives of the American people by driving leadership in energy innovation. Through Better Buildings, DOE partners with leaders in the public and private sectors to make the nation's homes, commercial buildings and industrial plants more energy efficient by accelerating investment and sharing of successful best practices.

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### Additional Questions?

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