

# HUD EPC VIRTUAL INDUSTRY DAY

NOVEMBER 16, 2021  
11AM-5PM EST

Hosted By  
Office of Public  
and Indian  
Housing  
Financial  
Management  
Division  
Energy Branch

Microsoft Teams



# HUD VIRTUAL EPC INDUSTRY DAY **AGENDA**

*Moving Energy and Water Efficiency Forward in Public Housing*

## **OPENING SESSION** – 11:00am – 11:20am

### *Greetings from HUD Leadership*

Adrienne Todman, Deputy Secretary of Housing and Urban Development (HUD)  
Crystal Bergemann, HUD Senior Advisor on Climate  
Danielle Bastarache, HUD Deputy Assistant Secretary  
Todd Thomas, Director, Office of Public Housing Programs

### *Energy, Water and Renewable Projects Today - 11:30am-1:00pm*

#### *Moderated by Charles Marshall, Director, HUD Energy Branch*

Cynthia Spence, Director of Modernization, Planning & Development, New Bedford Housing Authority  
Beth Keel, Green Building and Sustainability Program Manager, San Antonio Housing Authority  
Karen Schmitt, Energy Management Specialist, HUD Energy Branch  
Michael Blanford, Luis Borray, and Mark Reardon, HUD Policy Development and Research Team

**BREAK** 1:00pm – 1:30pm

## **SESSION TWO** - 1:30pm – 3:00pm

### *ESCOs and the EPC – 1:30pm – 2:15pm*

#### *Moderated by Dick Santangelo, President and CEO, Apollo Engineering Solutions*

Mary Fox, Vertical Market Director, Johnson Controls  
Lillian Kamalay, Senior Director, Housing Services, AMERESCO  
Don Gilligan, President, NAESCO

### *Innovating through Integrating EPCs and Incentives – 2:15pm-3:00pm*

#### *Moderated by Rick Sawicki, Senior Account Manager, Honeywell Building Solutions*

Rich Sissick, President, R. Sissick Consulting  
Michael Levinson, Principal/Multifamily Housing Team Leader, Group14 Engineering  
Holly Andreozzi, Senior Vice President Global Leasing, Bank of America

**BREAK** 3:00pm – 3:15pm

## **SESSION THREE** – 3:15pm – 4:45pm

### *Beyond EPCs: Alternative Vehicles for Energy Conservation Projects*

#### *Moderated by Crystal Bergemann, HUD Senior Advisor on Climate*

Bob Somers, President, 2RW  
Phill Consiglio, President, The Consiglio Consulting Group  
Calvin Roberts, UESC Business Consultant, Centerpoint Energy Inc.  
Toby Chandler, Resiliency / Sustainability Development Manager, Southern Company  
Will Volker, Principal, Efficiency Energy LLC  
Bob Havlicek, Executive Director, Housing Authority of the County of Santa Barbara

## **CLOSING SESSION** – 4:45pm -5:00pm



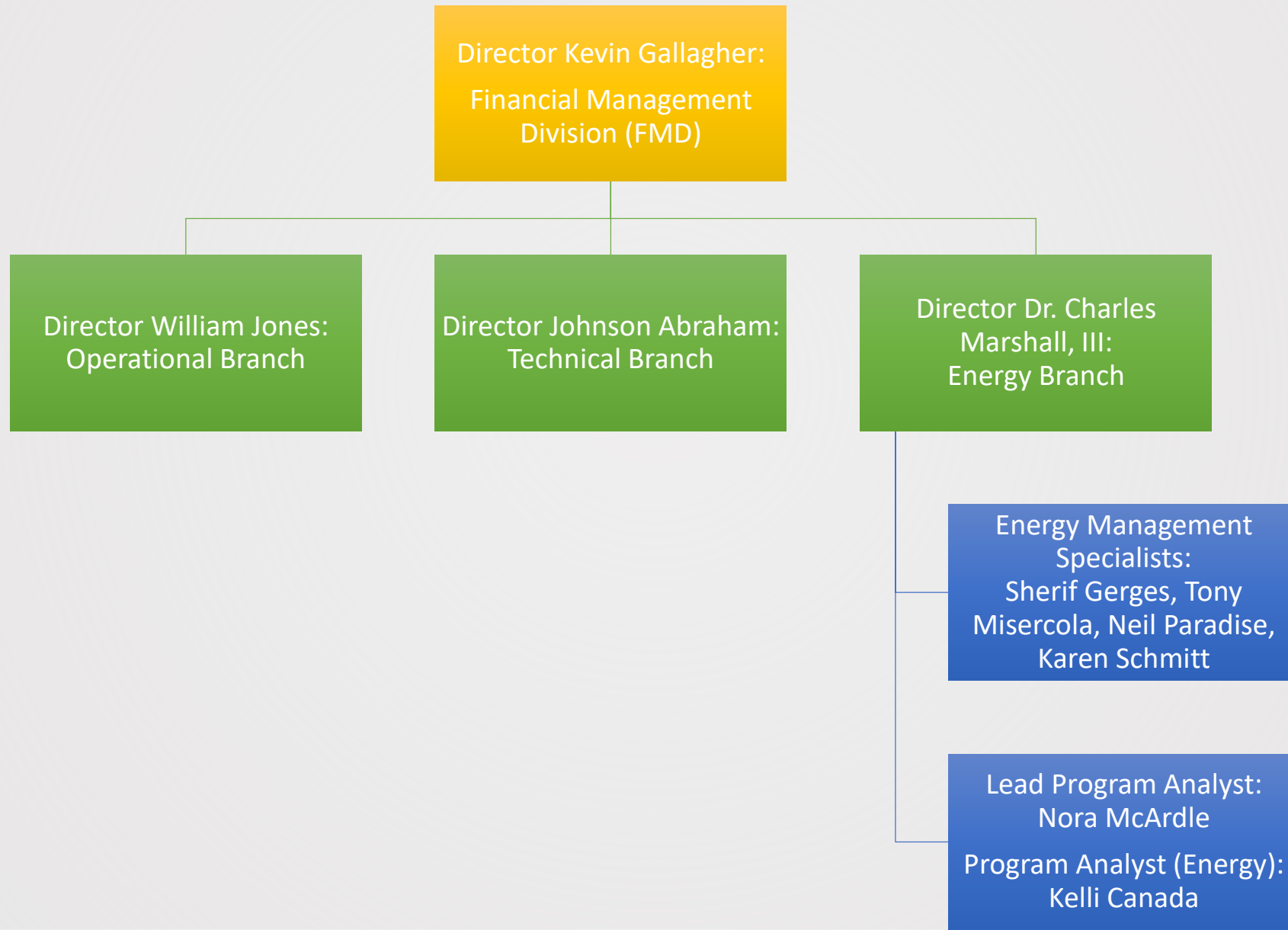
Welcome to  
HUD's EPC  
Virtual Industry  
Day: Moving  
Energy and  
Water Efficiency  
Forward in  
Public Housing



The Energy Branch:  
Providing Innovative Support for HUD's  
Energy Incentives at the Field Office and  
Public Housing Authority Levels

*Presented by: Karen Schmitt, P.E.*

# FMD's Organizational Chart – New Energy Branch and New Leadership



# The Energy Branch: Supporting HUD's Mission

HUD's mission is to create strong, sustainable, inclusive communities and quality affordable homes for all. HUD is working to strengthen the housing market to bolster the economy and protect consumers; meet the need for quality affordable rental homes; utilize housing as a platform for improving quality of life; build inclusive and sustainable communities free from discrimination, and transform the way HUD does business.

- HUD's Energy Incentives allow the leveraging of financial incentives to improve Public Housing
  - Investment in infrastructure and housing stock
  - Reduce utility costs/consumption with green capital improvements
  - Meet Global Sustainability Goals (e.g. 6-Clean water and Sanitation; 7-Affordable and Clean Energy; 10-Reduced Inequalities; 11-Sustainable Cities and Communities; 12-Responsible Consumption and Production; 13-Climate Action; 17-Partnership for the Goals)

**FMD Energy Branch  
Team: Energy  
Incentives through  
Operating Fund Grant  
Program**

EPC Incentives: Add-On Subsidy (AOS), Resident Paid Utilities (RPU), and Frozen Rolling Base (FRB)

Rate Reduction Incentive (RRI)

Small Rural Frozen Rolling Base (SR-FRB) – New Incentive

# Small Rural Frozen Rolling Base (SR-FRB)

- Notice PIH 2020-30 – Implements Section 209 (b) of the Economic Growth, Regulatory Relief, and Consumer Protection Act (Economic Growth Act)
- Provides opportunities for small rural housing authorities to implement energy and water efficiency projects.
- Allows eligible PHAs to freeze their three-year rolling base consumption level for up to 20 years
  - **List of eligible PHAs available at:**  
[https://www.hud.gov/program\\_offices/public\\_indian\\_housing/pha/lists](https://www.hud.gov/program_offices/public_indian_housing/pha/lists)

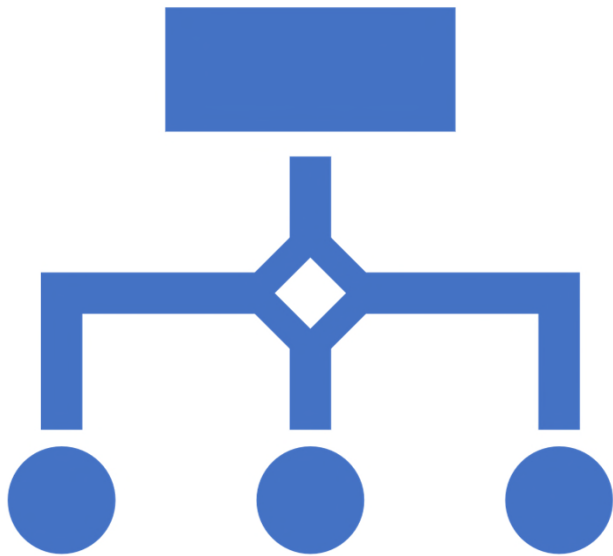


# Innovative Improvements to the Energy Programs

The Energy Branch is innovating the Energy Programs at HUD.

We are focusing on positive capital improvements to Public Housing, preventing Climate Change, and supporting our stakeholders to achieve these goals.

# New Leadership → New Initiatives



- EPC Industry Day – focusing on success and opportunities through the engagement of our stakeholders
- Utilizing the OpSub Web Portal to improve our programs: EPC Inventory, SR-FRB, QA/QC for EPC
- Reviewing EPC Measurement & Verification (M&V) through the support of a contract
- Creating Training and Tools to improve the process – EPC Incentives Training Videos, Training on Repositioning

# Energy Branch Recorded Training for PHAs: Energy Performance Contract (EPC) Incentives Management Training

The EPC Incentives Training Videos will assist PHAs with an EPC in developing the knowledge and skillsets needed to better understand EPCs and help PHAs to review and request various EPC incentives on Form HUD-52722 and 52723 during the annual Operating Fund Grant (OpFund) process.



# EPC Incentives Training Videos: Eight Recorded Training Sessions

1. Understanding Measurement & Verification reports (M&V).
2. How Do Baseline Adjustments Affect My Subsidy?
3. What Are Eligible Energy Performance Contract (EPC) Project Costs?
4. How Do I Determine Frozen Rolling Base (FRB) Savings?
5. How Do I Determine Resident Paid Utilities (RPU) Savings?
6. How Do I Determine Add-On Subsidy (AOS) Savings?
7. How Does the 75-Percent Rule Impact Savings?
8. What Is Cross-Subsidization of EPC Incentives?

**Available now on HUD Exchange:**

**<https://www.hudexchange.info/trainings/courses/epc-incentives-management-training/>**



# Supporting Repositioning Goals at HUD

- Repositioning PHAs through Rental Assistance Demonstration (RAD) and Section 18 of the U.S. Housing Act of 1937
- PHAs with an EPC may need a revised EPC Approval Letter prior to closing
  - If less than 5% of units removed from EPC or paying off entire EPC debt, no review necessary.
  - Change in Contract Costs or Savings of More than 10% - revised EPC Approval is needed.
  - **The Energy Branch is available to support your repositioning goals and guide you through the process.**

# Energy Branch Contact Information

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ENERGY BRANCH DIRECTOR:  
DR. CHARLES MARSHALL, III

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# NEW BEDFORD HOUSING AUTHORITY ENERGY PERFORMANCE CONTRACTING FROM CENTRAL OIL-FIRED STEAM TO SOLAR

- Cynthia Spence, Director of Modernization, Planning & Development
  - NBHA: Founded in 1938
  - 1749 Federal Units, 760 State-Funded
  - 1800 Rental Vouchers

# EPC EXPERIENCE



- First EPC in mid 1990's focused on decentralization of oil-fired steam plant to building based gas efficient heat and hot water
- Two major developments converted from steam to gas - Westlawn (200 units); Presidential Heights (198 units)
- First generation technologies of high efficiency gas equipment, low-flow toilets, compact fluorescent lighting



# EPC Technology Shift in 2020

- 2.4 MW of Authority-owned rooftop solar; state solar cash incentives range from 14 cents to 22.5 cents per kWh produced
- 45% reduction in electricity consumption; 2.5 million lbs CO<sub>2</sub> reduction
- \$12.7 million contract
- Frozen electric base with HUD; \$500,000 annual state solar incentive
- 2<sup>nd</sup> generation lighting (LEDs), exterior lighting (too expensive in first EPCs), and boiler replacement after 25 years



# EPC Processes

- Procurement & Audit (consultant for cost-reasonableness, technical review)
- Contract & HUD Approval (blending of state incentives for solar)
- Financing (tax-exempt lease & Section 30 approval)
- Construction (COVID, rooftop construction, outside areas, apartments)
- Operations (obtaining utility approval and state incentives)
- M&V (currently in Year 1 - COVID & interconnects delay state \$)



## FIRST YEAR CHALLENGES

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Interconnect process with  
utilities - delays

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Debt Obligation and Timing

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Apartment construction  
completion given COVID

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Matching HUD Incentives  
with State Incentives - Timing



**SAHA** | SAN ANTONIO  
HOUSING AUTHORITY  
Opportunity Lives Here

# Self-Implemented EPC

11/09/2021

### What is an EPC?

- An Energy Performance Contract is a financial tool to create a comprehensive set of energy efficiency, water efficiency, renewable energy, and system optimizations, called Energy Conservation Measures (ECM's).
- EPC's are third party financed, typically in the form of an operating lease or private bank loan.
- The ECM's selected are guaranteed savings that the project will cover the cost of the loan with over the life of the investment.
- The EPC is planned by using an ASHRAE level 2 energy audit or also called an Investment Grade Audit along with of all of the facilities consumption data.
- The engineer will identify ECM's with short and long payback periods where the savings generated through the project will compensate the loan.



### What is M&V?

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- Monthly measurement and verification for water consumption and yearly engineered M&V reports for all ECM's are submitted to HUD to ensure debt service on the project is paid.
- 10% of the units are audited yearly
- Before audits start the properties are encouraged to do a self audit of the units and to fix or replace any ECM's that are not functioning properly
- A list of deficiencies are provided to the property after the audit, the property emails me when all items are repaired



### EPC Phase 1 and 2

- Phase 1 has 2,180 units
- Phase 2 has 2,324 units
- Most of the ECM's have a 5 year or less payback which include, aerators, shower heads, flush valves, and LED lighting
- 2 solar systems were installed, totalling 125KW
- 1 new boiler plant was installed
- 359 heat-pumps were installed



# Lessons Learned

## EPC from Phase 1 to Phase 2

5

### EPC Phase 1 and 2

- Heavy front end coordination
- Working with property managers, super intendants, and staff to review all ECM's and provide feedback
- Ensuring all sub contractors understand the lessons learned from Phase 1 and do not repeat the same mistakes
- Property and tenant engagement
- Messaging of what an EPC is and expectations we have on the tenets to keep measures in place
- Ensuring property management inspects measures as they enter units and has stock of items





# Lessons Learned

## EPC from Phase 1 to Phase 2

6

### EPC Phase 1 and 2

- Teaching the contractors how an Energy Performance Contract (EPC) works
- Why we are requesting specific Energy Conservation Measures (ECM)
- How the Commissioning works and what their role is during and after the audits
- Bringing attention to small deficiencies to reduce Cx findings during audits



# Staff Engagement

## EPC Phase 1 and Phase 2

7

### EPC Phase 1 and 2

- Messaging of what an EPC is and expectations we have on the tenets to keep measures in place
- Ensuring property management inspects measures as they enter units and has stock of items
- Providing training on troubleshooting typical issues of ECM's and making sure the staff knows to maintain the system and troubleshoot before the vendor is called out for a warranty issue
- Coordinating with staff on what was included in the contract and what was not



# Impact

- Savings projected below
- EPC Phase 1 is seeing an average of 10% savings with electric and considerable savings with water

	Annual Consumption Savings			
	Water & Sewer (kGal)	Electricity (kWh)	Natural Gas (CCF)	metric tons CO2 total
Phase I	18,359	2,742,213	50,572	1,838
Phase II	22,476	4,435,165	25,732	2,983
Total	40,834	7,177,378	76,304	4,822

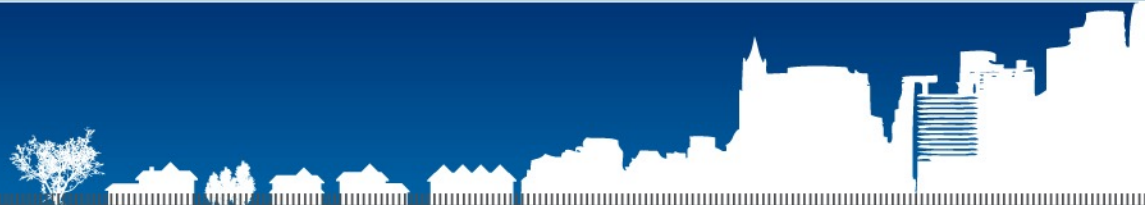
# QUESTIONS?

# Energy Performance Contracting Research Overview

Office of Policy Development & Research  
Affordable Housing, Research & Technology Division



PD&R



# Affordable Housing, Research & Technology

**The Affordable Housing Research and Technology Division - AHRT - is located in the Office of Policy Development and Research (PD&R).**

The division studies new housing technology and policy, as well as new community approaches to housing design, building codes, land use planning, and housing issues related to “green” construction and energy efficiency.

**Mike Blanford** – Research Engineer

**Luis Borray** – Architect

**Mark Reardon** – Social Scientist



**PD&R**





### Office Of Innovation

The Office of Innovation selects, manages, and reports progress on innovation and improvement efforts strategically aligned with the Department’s mission.



### International And Philanthropic Affairs Division

IPAD supports HUD’s efforts to find new solutions and align ideas and resources by working across public, private, and civil sectors to further HUD’s mission.



### EnVision Centers

The EnVision Center Demonstration is empowering all people to fulfill their potential by providing the tools needed to succeed.

[www.HUDuser.gov](http://www.HUDuser.gov)



### Student Planning & Design Competition

The Innovation in Affordable Housing Student Design and Planning Competition (IAH) is a HUD initiative in which interdisciplinary graduate student teams work to solve a real life issue in affordable housing design and planning.



### Research Partnerships

The Department of Housing and Urban Development’s Office of Policy Development and Research (PD&R) has the authority to accept unsolicited research proposals that address current research priorities and allow PD&R to participate in innovative research projects that inform HUD’s policies and programs.



### Regulatory Barriers Clearinghouse

HUD established the Regulatory Barriers Clearinghouse (RBC) to collect, process, assemble, and disseminate information on state and local regulations and policies affecting the creation and maintenance of affordable housing.

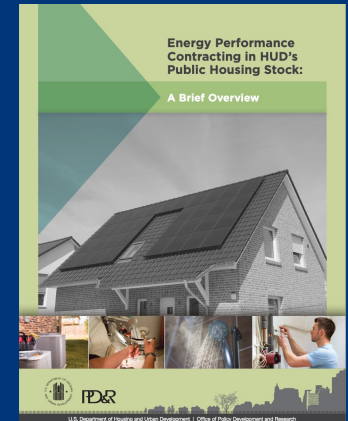


# Energy Performance Contracting in HUD's Public Housing Stock: A Brief Overview (2017)

- Exploratory Study of the effectiveness and value of HUD PIH Energy Performance Contracting (EPC) Program
- Onsite visits to 9 PHAs that have either executed a new EPC or exercised an option to an existing EPC in place since 2010

## Findings –

- Eight of the nine participants felt the program to be (1) a benefit to their housing authority, (2) to have funded improvements that otherwise would not have been made; and (3) either was outperforming or performing as projected.
- Five of the housing authorities reported cost savings in excess of the EPC debt service.



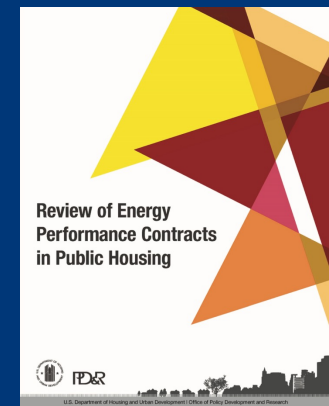
## Authors:

- Michael D. Blanford
- Michael J. Early
- Barry L. Steffen
- Will R. Zachmann





# Energy Performance Contracting in HUD's Public Housing Stock: A Brief Overview (2020)



Assessed the effectiveness and value of its Energy Performance Contract (EPC) program by comparing trends in the utility consumption and the financial and physical condition of public housing authorities (PHAs) that have implemented EPCs with those that have not.

## Findings -

- PHAs that have implemented EPC projects have been able to cut their electricity consumption by more than twice as much as PHAs that have not (10.3 percent as compared with 4.4 percent).
- Electricity consumption declined at a significantly greater rate in the years after an EPC was performed than in the years immediately before.
- Approximately 60 percent of PHAs that had executed at least one EPC indicated they were favorably disposed toward doing another

## Authors:

- Anna E. Bower
- Michael E. Canes
- Stuart D. Funk
- Jyothsna Prabhakaran
- Amy Deora
- Rob Hazelton

## Orgs:

- CIVIS Analytics
- Domination Due Diligence Group
- LMI



# Review of Energy Performance Contracts in Small and Very Small Public Housing Authorities (2021)

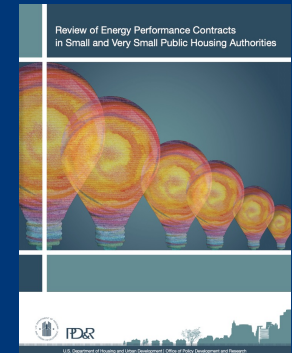
Follow-up to 2020 study with focus on 185 small and very small PHAs.

Evaluated whether PHAs that used EPCs outperformed those who did not with respect to reducing utilities and improving financial and physical condition.

**Methods** - Survey + Follow-up Interviews

**Findings** -

- PHAs that conducted EPCs demonstrated significantly greater improvements for three of eight utility types,\* and insignificant but positive improvements for the other utility types.
- Among PHAs with both EPC and non-EPC units, EPC affected units were more energy and water efficient and in better financial and physical shape.
- Analysis of UEL data before/after = reduction in energy consumption\*
- Follow-up Interviews indicated PHAs who undertook one or more EPCs were satisfied with savings in energy and water costs.



**Authors:**

- Michael E. Canes
- Stuart D. Funk
- Mai Anh H. Nguyen
- Jyothsna Prabhakaran
- Rob Hazelton

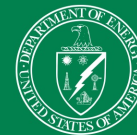
\* result is statistically significant



# Future AHRT Related Research Endeavors

## Innovations in Energy Efficiency Webinar Series

November 29 - December 2, 2021



★ A DOE HUD Collaboration ★

## Innovations in Energy Efficiency Webinar Series

- 8-part virtual conference
- Content will be basic, practical, and actionable
- Emphasis on rehabilitation of single- and multifamily housing
- Topics covered range from energy efficiency fundamentals to advanced topics such as the latest energy code requirements

[www.huduser.gov/portal/energy-webinars/home](http://www.huduser.gov/portal/energy-webinars/home)

## Research Partnership Program - FR-6500-N-USP



PD&R



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