



**Green & Healthy  
Homes Initiative®**

# **Health and Energy Efficiency**

Illinois Stakeholder Advisory Group

February 25, 2019

**Will Klein**

# January 2019 Polar Vortex



Weatherization is a health issue

**27 deaths**  
**across 8 states**

Family of nine in Wheeling, Illinois taken to local hospital after heating their home with a charcoal grill

The INSIDE of my front door. 😊 Indiana cold  
[pic.twitter.com/oQKcnHTOt2](https://pic.twitter.com/oQKcnHTOt2)  
3 9:39 AM - Jan 31, 2019





**Our Mission:**  
Break the link  
between unhealthy  
homes and  
unhealthy families

# What is Green & Healthy Homes Initiative?

## Direct Service Program

- Aging well
- Asthma
- Energy efficiency
- Lead poisoning prevention
- Weatherization

## Technical Assistance

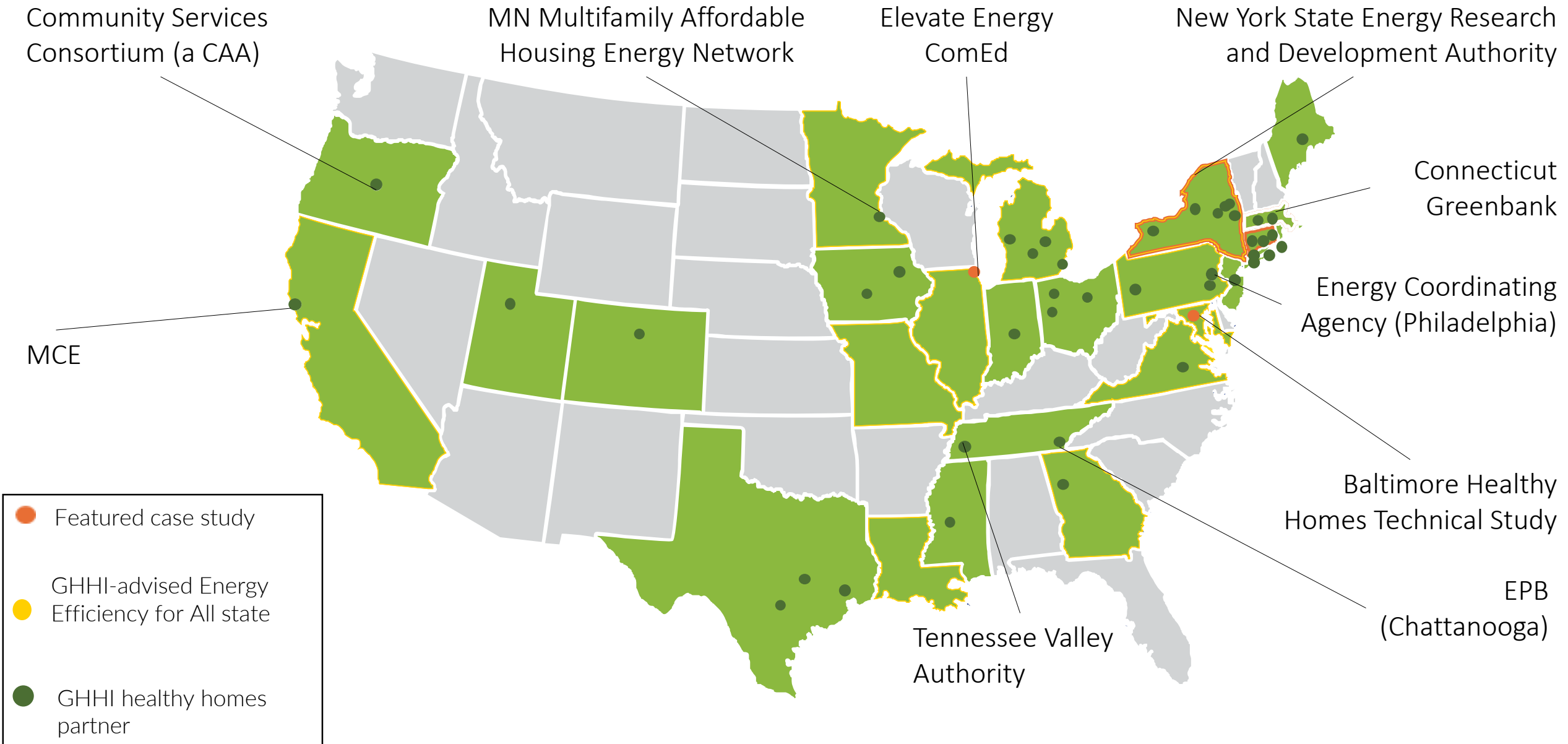
- Capacity building
- Strategic planning
- Re-managing government



## Policy & Innovation

- Pay for Success & Social Impact Bonds,
- Public Policy Recommendations, and
- Healthcare engagement

# GHHI Health and Energy Work



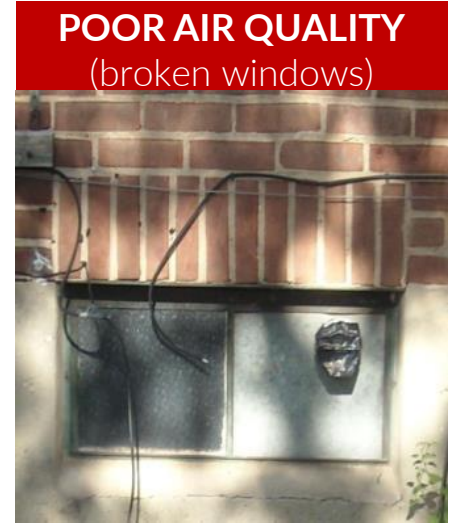




# Family Case Study: DeWayne's Story



DeWayne Davis, age 8, suffered from chronic asthma repeatedly hospitalized and missing school



His unhealthy, energy-inefficient home was full of asthma triggers.



# Family Case Study: DeWayne's Story



\$48,000 avoided medical expense  
 \$400/year decrease in energy bills  
 Improved school attendance

**EFFICIENT WINDOWS**  
(HUD)



**REMOVE CARPET**  
(HUD)



**RESURFACE FLOORS**  
(HUD)



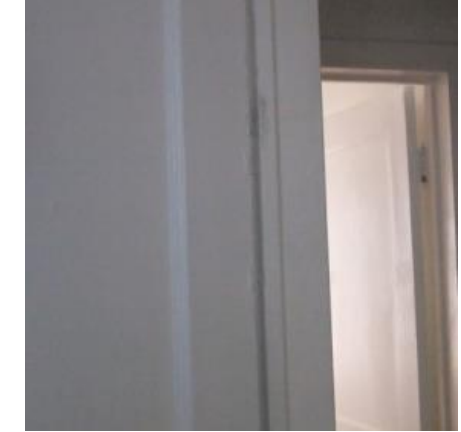
**INSTALL FURNACE**  
(philanthropy, WAP)



**DEHUMIDIFIER**  
(HUD)



**STABILIZE PAINT**  
(HUD)



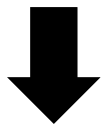
Braiding resulted in 25% lower intervention cost (\$12k vs \$16k)

# The GHHI Solution:

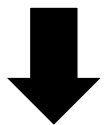
Address the whole home



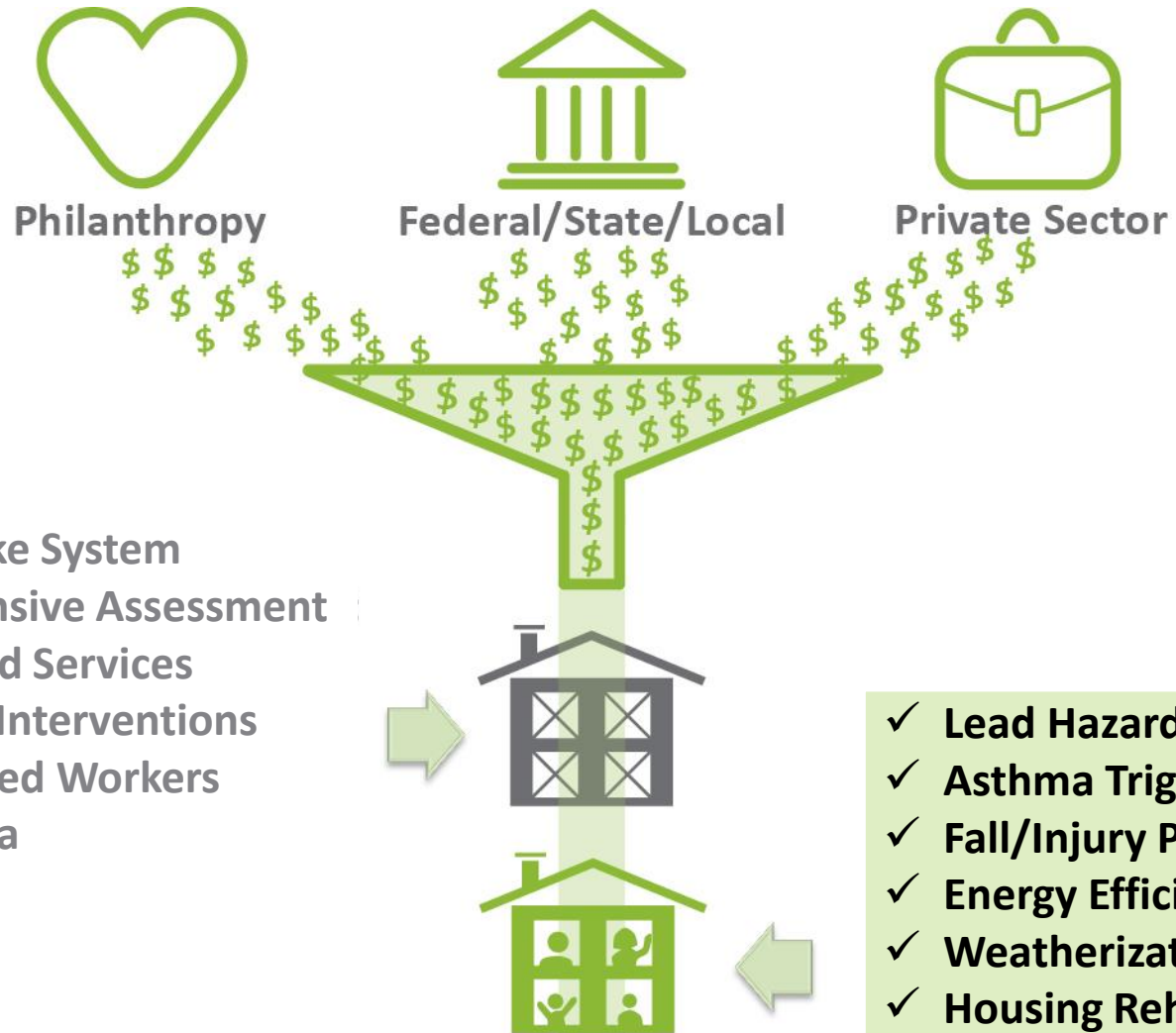
**Align**  
services & funding



**Braid**  
relevant resources



**Coordinate**  
service delivery





# The GHHI Differentiator:

## Cross-trained Teams

### Environmental Health Educator

- Conduct in-home resident education
- Coordinate pre and post client health surveys
- Coordinate follow-up client services

### Energy Auditor-Environmental Assessor

- Conduct pre-intervention environmental assessments
- Conduct energy audits
- Develop comprehensive scopes of work
- Conduct post-intervention quality control

### Multi-Functional Contractors

- Address the hazards identified on scopes of work
- Results in increased team capacity
- Exposes opportunity for job training and economic development for residents of low-income communities

\*\*Center for Employment Opportunities study in Buffalo found that workers who were cross trained in weatherization and healthy homes skills were able to earn \$4-8 more per hour





# The Challenge: Unhealthy + Energy Inefficient Housing

# The Burden of Sub-Standard Housing



**30 million families live in unhealthy homes**

## **Economic Impacts**

*14M missed work days*

- Reduced productivity
- Lower job security
- Less access to benefits

## **Health Impacts**

*\$155B in direct medical costs  
(lead, asthma, injury)*

- Environmental hazards
  - lead paint
  - asthma triggers
- Mental health conditions
  - Stress
  - anxiety
- Childhood stress
  - chronic health conditions

## **Education Impacts**

*14M missed school days*

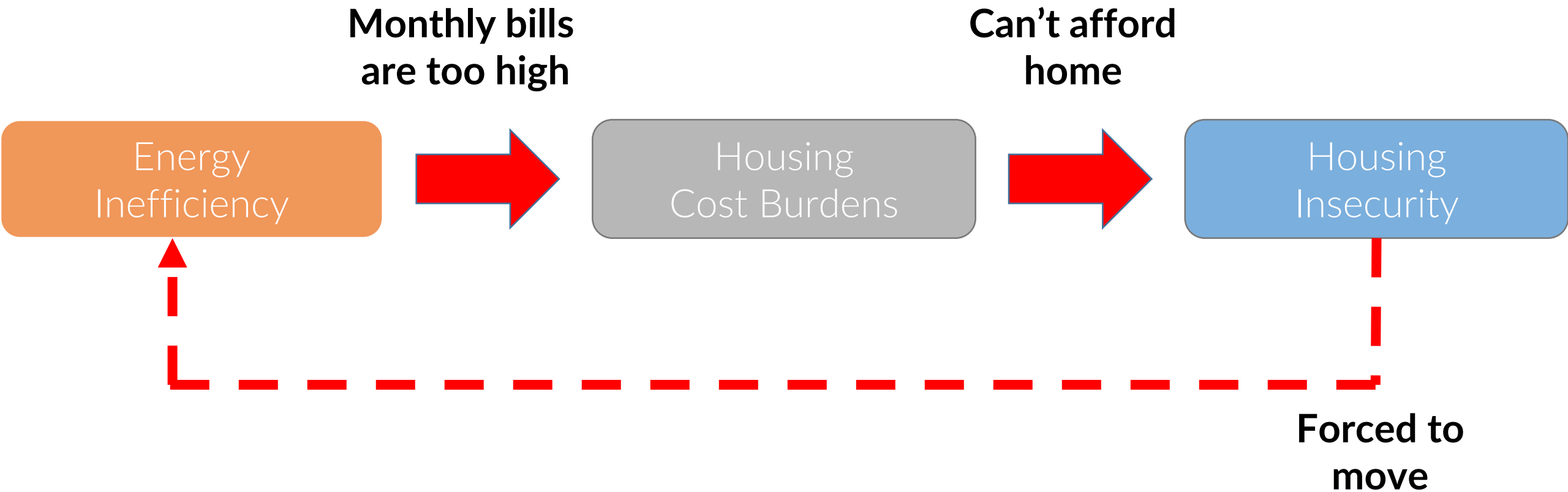
- Poor grade level performance
- Lower graduation rates
- Lost earning potential





# Not As Obvious (Outside these Walls):

Energy (In)Efficiency and Family Stability





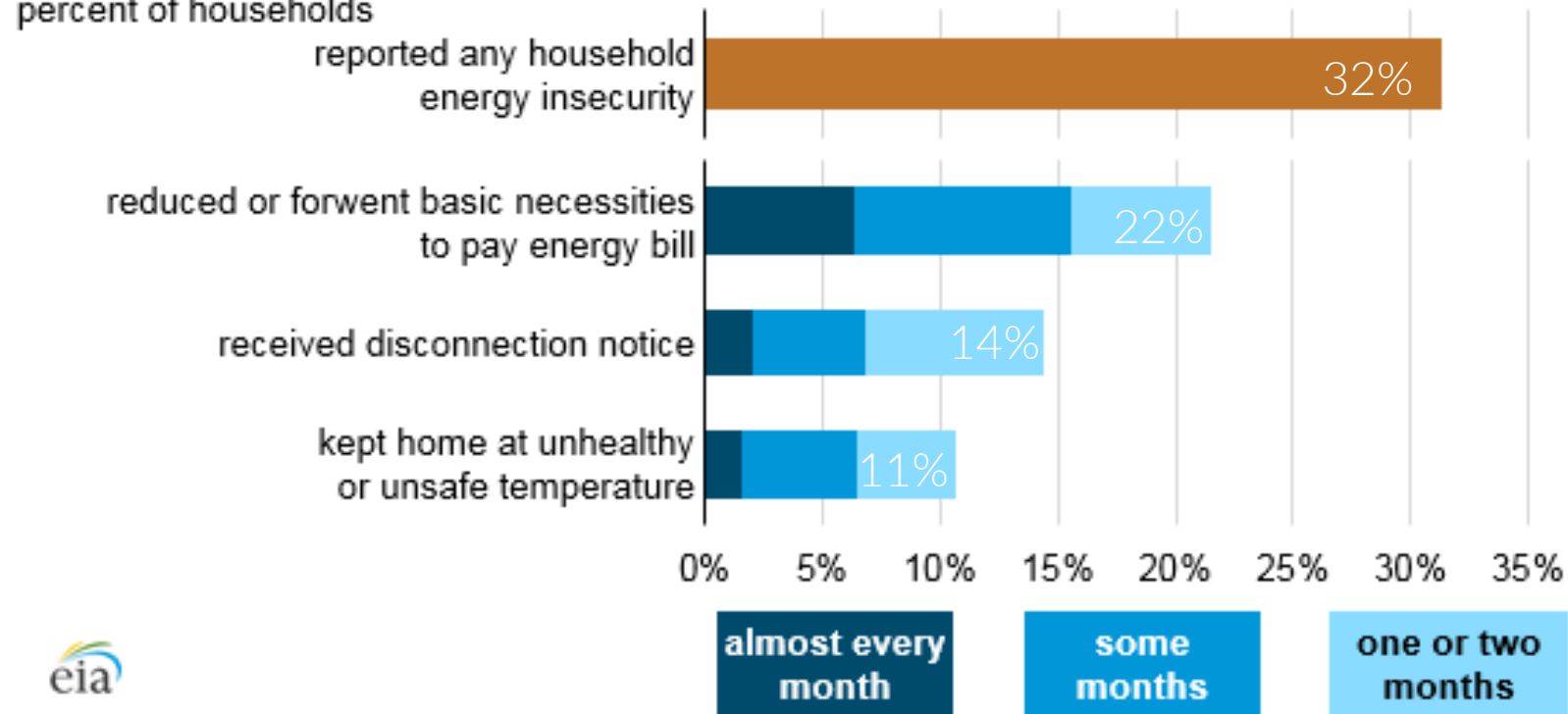
# Family Impact of Energy Inefficiency



One in three U.S. households faces a challenge in meeting energy needs

## Households that experienced energy insecure situations, 2015

percent of households



Source: U.S. Energy Information Administration, *Residential Energy Consumption Survey 2015*



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# Energy Efficiency and Health

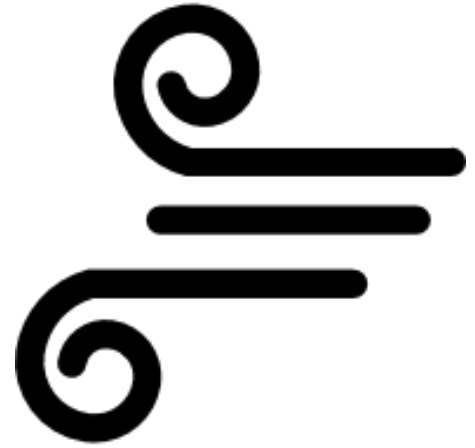


## Direct Impacts



### Electricity

Poor lighting



### Air

Temperature  
Quality



### Water

Mold  
Allergens








### Hazards

Lead  
Asbestos  
Pests













# Health Impacts of Efficiency Programs

	Measure	Health Impact	Example rebates	Common Gaps
	<b>Electric Baseload</b> Improves lighting from: <ul style="list-style-type: none"> <li>• Having affordable lights</li> </ul>	<ul style="list-style-type: none"> <li>• Trip/fall</li> </ul>	<ul style="list-style-type: none"> <li>• Lighting</li> <li>• Appliances</li> </ul>	
	 <b>HVAC</b> Decreases thermal stress from: <ul style="list-style-type: none"> <li>• Enabling affordable heating and cooling</li> </ul> Improves air quality from: <ul style="list-style-type: none"> <li>• Reduced allergens</li> <li>• Reduced moisture and mold</li> </ul>	<ul style="list-style-type: none"> <li>• Cardiovascular</li> <li>• Respiratory</li> </ul>	<ul style="list-style-type: none"> <li>• Heating/Cooling</li> <li>• Fans</li> <li>• Thermostats</li> <li>• HVAC Tune-up</li> </ul>	<ul style="list-style-type: none"> <li>• Ventilation</li> </ul>
	 <b>Building envelope</b> Improves air quality from: <ul style="list-style-type: none"> <li>• Reduced moisture and mold</li> <li>• Reduced outdoor allergen</li> </ul> Decreases thermal stress from: <ul style="list-style-type: none"> <li>• Insulation</li> </ul>	<ul style="list-style-type: none"> <li>• Respiratory</li> <li>• Cardiovascular</li> </ul>	<ul style="list-style-type: none"> <li>• Air sealing</li> <li>• Insulation</li> </ul>	<ul style="list-style-type: none"> <li>• Roofs</li> <li>• Windows</li> </ul>



# Achieving Whole Home – Health/Safety



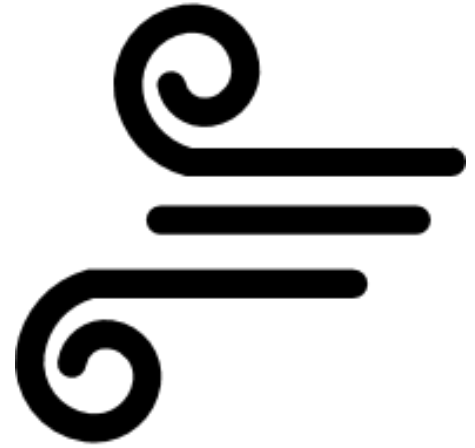
Measure	Health Impact	Example measures
 <b>Plumbing</b> Improves air quality from: <ul style="list-style-type: none"><li>• Reduced moisture and mold</li></ul>	<ul style="list-style-type: none"><li>• Respiratory</li></ul>	<ul style="list-style-type: none"><li>• Leaking pipes</li></ul>
  <b>Hazard Removal</b> Removes harmful chemicals	<ul style="list-style-type: none"><li>• Respiratory</li><li>• Cancer</li><li>• Lead poisoning</li></ul>	<ul style="list-style-type: none"><li>• Mold</li><li>• Asbestos</li><li>• Radon</li><li>• Lead</li></ul>
  <b>Pests &amp; Sanitation</b> Removes allergens	<ul style="list-style-type: none"><li>• Respiratory</li></ul>	<ul style="list-style-type: none"><li>• Pest management</li><li>• Hypo-allergenic bedding, vacuum</li></ul>
  <b>Air Quality</b> Removes irritants	<ul style="list-style-type: none"><li>• Respiratory</li></ul>	<ul style="list-style-type: none"><li>• Combustion gases</li><li>• VOCs</li></ul>
 <b>Hazard Repair</b> Removes injury hazards	<ul style="list-style-type: none"><li>• Trip/fall</li><li>• Unintentional injury</li></ul>	<ul style="list-style-type: none"><li>• Fall hazards (e.g. uneven stairs)</li><li>• Safety hazards (faulty wiring)</li></ul>



# Power of Health/Energy Partnership



**Electricity**  
Poor lighting



**Air**  
Temperature  
Quality



**Water**  
Mold  
Allergens



**Hazards**  
Lead  
Asbestos  
Pests





# Why healthcare cares about housing:

## Social Determinants of Health

**80%**

80% of health outcomes are driven by social determinants of health

**3%**

While only 3% of healthcare dollars are spent on preventive services



# Illinois Healthcare Wants to Address Housing



- **State Health Improvement Plan**

- Develop action items to address social determinants of health and other structural issues such as housing, employment, and education
- Prioritizes chronic health, specifically Type 2 diabetes and ischemic heart disease mortality

- **Medicaid insurer requirements**

- Incented to reduce adult hospital visits from chronic diseases, like diabetes, COPD, asthma, hypertension, heart failure, and angina
- Incented to partner with community organizations to address social determinants of health (e.g. efficiency implementers)

- **Hospitals**

- Community needs assessments provide opportunity to define need for community benefit dollars



# How Healthcare is Paying for Home Repairs



## Hospital Community Benefits

*Any age (un- & under- insured)*

**Chicago:** assessor and remediation of asthma hazards (pilot)

## CHIP State Plan Amendment

*Children*

**Michigan:** \$119M to remediate lead hazards

**Maryland:** \$14M to remediate asthma and lead hazards

## Medicaid Managed Care Organizations

*Any age*

**Michigan:** assess and remediation of asthma triggers (pilot)

**Maryland:** assess and supplies to mitigate asthma triggers

## Medicaid Home & Community Based Services

*Older adults, disabled*

**Most states:** home accessibility modifications

## Medicaid Demonstration Waivers (1115)

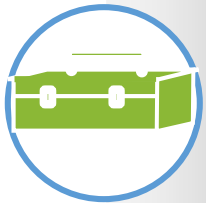
*Any age*

**Oregon:** 'flexible services' includes air conditioners for asthmatics

## Medicare Advantage

*Older adults (65+)*

**St. Louis:** 'supplemental benefits' includes home repairs for fall prevention



# Benefits to Efficiency Sector



Benefit	How healthcare can help	GHHI examples
<b>Achieve Whole Home Vision</b>	<ul style="list-style-type: none"><li>• Shared cross-trained assessors</li><li>• Unlock healthcare dollars</li></ul>	<ul style="list-style-type: none"><li>• NYSERDA</li><li>• BPI Healthy Homes Evaluator credential</li></ul>
<b>Address health/safety barriers</b>	<ul style="list-style-type: none"><li>• Unlock healthcare dollars</li></ul>	<ul style="list-style-type: none"><li>• Connecticut Greenbank</li></ul>
<ul style="list-style-type: none"><li>• Deferrals</li><li>• Medical waivers</li></ul>		
<b>Get credit for non-energy benefits</b>	<ul style="list-style-type: none"><li>• Quantify outcomes via medical data</li></ul>	<ul style="list-style-type: none"><li>• GHHI Baltimore</li></ul>
<b>FEJA Equity Goals</b>	<ul style="list-style-type: none"><li>• Data targeting via medical data</li><li>• Trusted customer relationships via community partnerships</li></ul>	<ul style="list-style-type: none"><li>• Chicago Pilot</li></ul>



# Achieve Whole Home Vision

NYSERDA (New York State Energy Research & Development Agency)



- **Phase 1: Seeding the market**
  - Rate-payer dollars to fund in-home education + healthy home repairs
- **Phase 2: Medicaid co-investment**
  - NY requires Medicaid insurers to develop value-based contracts with community-based organizations, providing flexibility for them to pay for healthy homes interventions
- **Cross-trained implementers**
  - Single assessor for energy and health assessment
  - Same set of contractors for healthy home repairs



# Addressing Health/Safety barriers

## Connecticut Greenbank and CT Department of Public Health

### Challenge

# 45%

Up to 45% of homes in low income communities are deferred for health/safety issues

# 25k

Nearly 25,000 homes on medical protection for serious or life-threatening illness

### Solution

- Align, braid, coordinate service programs from energy, health, and housing funds
- Estimate Medicaid savings from claims data
- Ability to reallocate medical waiver funds?



# Training Opportunity for Your Teams:

## BPI Healthy Homes Evaluator Micro-Credential



Developed by the Building Performance Institute, GHHI and other key partners

Supports the further integration of healthy housing and weatherization/energy efficiency intervention funding streams

Go to [BPI](https://www.bpi.com) website to find a BPI testing center in your area







# Non-Energy Benefits

## Baltimore Healthy Homes Technical Study

For high-risk asthmatic children, addressing weatherization needs increased Medicaid savings 5X

### Average Medicaid costs per client (12 months pre/post)

<b>Group</b>	<b>% Change</b>	<b>\$ Change</b>	<b>Baseline</b>	<b>n</b>
<b>Control (no intervention)</b>	-18%	-\$898	\$5,063	239
<b>Home Visits, Supplies</b>	-7%	-\$530	\$7,821	128
<b>Home Repair + Home Visits, Supplies</b>	-35%	-\$2,959	\$8,415	111

**Home visits:** primarily parental education

**Supplies:** carpet and other home surface cleaning or replacement, window sealing, and basic pest management

**Home repair:** Major modifications, such as gutter and roof repairs, and even furnace repairs or replacements.

# Achieving Equity Goals

Chicago pilot



- Can we identify clusters of families with both high medical and energy needs?
  - Use Presence health data, target multi-family buildings
- Can we utilize cross-trained assessors for a single health and energy assessment?
  - Elevate assessors are or will be BPI Healthy Homes Evaluator certified
- Can we develop a coordinated service delivery model that achieves a whole-home retrofit for ComEd customers with significant health, safety and energy needs?
  - Leveraging both staff and financial resources of ComEd and Presence Health



# The Team



Identifies and enrolls high-utilizing asthma patients, provides asthma education and PCP connection.



Leverages expertise in energy efficiency and weatherization sectors to assess and remediate environmental triggers of asthma.



Provides comprehensive technical assistance modules, including stakeholder analysis, intervention planning, and sustainable funding options ranging from Pay For Success (PFS) financing to direct reimbursement.



Provides Illinois policy context and connections with similar efforts targeting multi-family buildings across country



# Pilot Details

- **Timeframe:**
  - Phase 1: December 2017 to September 2018
  - Phase 2: March 2019 – March 2020
- **Eligibility:**
  - At least 1 ED or inpatient admit for asthma in past 12 months, uninsured, under 65 years old
- **Enrollment:**
  - Combined: 30 patients, identified through Presence Health records
- **Intervention:**
  - Home visits by community health workers
  - Supplies: HEPA vacuum/air filter, green cleaning, mattress and pillow cover
  - Home Repair: energy efficiency + health/safety measures
- **Funding:**
  - Community Benefit, ComEd Call for Ideas, philanthropy, in-kind



# Case #91740

- 3 unit building
- Patient lives in basement unit
- Patient is 19 years old
- Hospitalized for asthma within the past 12 months
- Unemployed
- Lives with his father and his younger siblings







# Issue: Point Source Moisture/Mold (before)

Moldy drywall by bathroom, kitchen, and hallway

The Combustion Appliance Zone (CAZ) was not properly closed off





# Issue: Point Source Moisture/Mold (after)

Moldy walls removed, new water resistant drywall installed

Door added to properly close CAZ





# Issue: Flue Pitch/High Carbon Monoxide

Domestic Water Heater is negatively pitched

The flue pipe had material blocking the full use of the pipe







# Missed Opportunities – Phase 1

- EE Retrofit of the building
  - In need of new furnace, 2 water heaters and roof cavity insulation
- Family referred to the ComEd MF program
  - \$10,000 in upgrades needed
  - Family can not afford the retrofit



# Preliminary Results from Initial Pilot

- 19 out of 20 participants improved their Asthma Control Test (ACT) score
- 18 out of 20 reached a score of at least 19. (19+ =participant has “controlled” asthma)
- The average improvement was 7.11 points—a 56% improvement over average baseline ACT score
- 72% of those who responded experienced reduced interference with work and school due to asthma and a reduced reliance on their rescue inhaler





## Phase 2 – Goal

To develop a coordinated service delivery model that achieves a whole-home retrofit for ComEd customers with significant health, safety and energy needs and that leverages both time and financial resources of ComEd and Presence Health.

# Our Opportunity and Our Charge



Achieving Health Equity through Affordable Efficiency

Foster innovative financing from anchor institutions to fund *affordably efficient housing*



**Will Klein**  
Social Innovation Specialist

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[www.ghhi.org](http://www.ghhi.org)

