

Prescribed Home Energy Retrofits

Healthy Home

Connect

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Approach

Energy Saving Assistance Program (ESA)

Energy efficiency improvements



Peninsula Minor Home Repair Program + Rebuilding Together

Home repairs with a focus on health & safety



SASH – Single Family Affordable Solar Housing Program

Rooftop solar photovoltaics

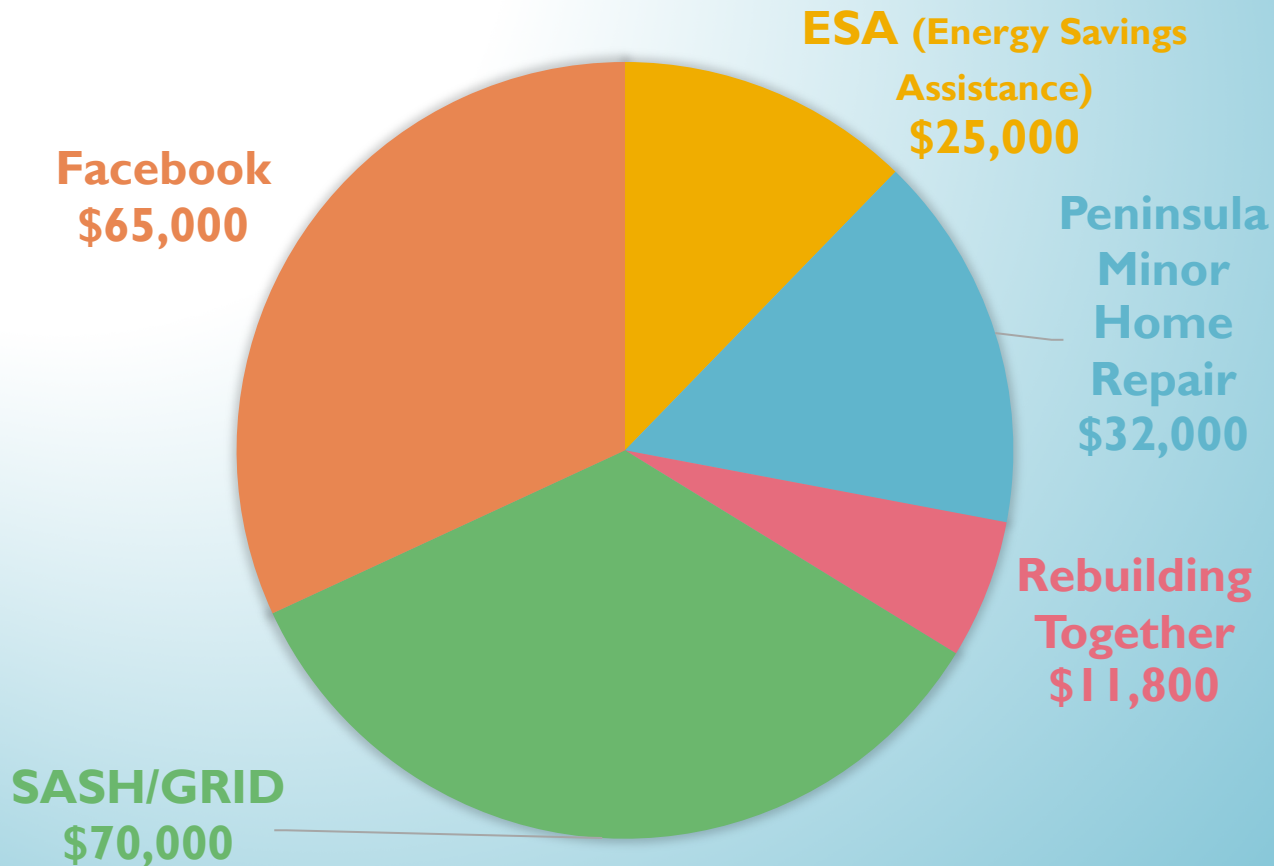


Facebook Grant

Gap funding for health remediations + repairs for disqualified homes



Funds Allocated for Home Improvements: \$208,800



The Hayward Score

Describe your crawlspace.

If you have a sealed crawlspace, please select one option below

- Exposed or partially exposed dirt floor/no sealed barrier
- Plastic barrier that is completely sealed to the walls and around posts
- Sealed plastic barrier AND mechanically ventilated air
- I don't know

Heating and cooling systems are typically thought of as affecting only comfort and temperature, but you may not be aware of how much they impact your health.

Please describe the primary heating system in your home.

- Forced/central heat (air flowing from a register in the floor, wall, or ceiling)
- Baseboard
- Radiant floor
- Wall heater/furnace
- Floor furnace

<https://www.haywardscore.com/>

Has your home ever had a professional:

	Yes	No	I don't know
Energy Retrofit (add insulation and/or air sealing)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Major remodel/renovation (room addition, plumbing/electrical upgrades, kitchen/bath remodel)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lead remediation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asbestos abatement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radon mitigation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Home Snapshot: Belle Haven

Hayward Score of **13**

3 People in Household - 3 year old w/ asthma



Home Snapshot: Belle Haven

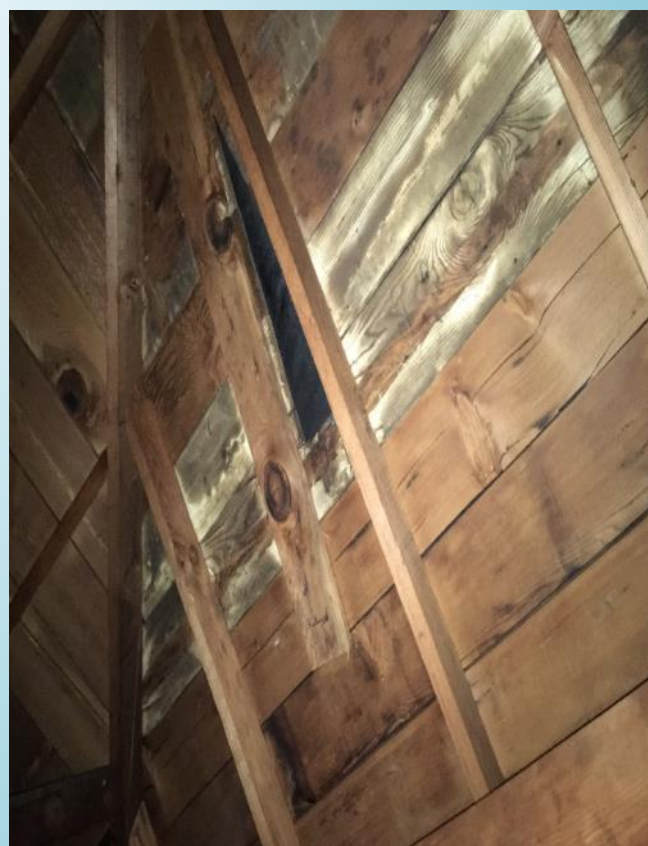
Multiple health & safety issues: Dust, mold, pests, clutter, poor IAQ, no vents, no heat, open to attic



Home Snapshot: Belle Haven

Hayward Score of **4**

1 Person in Household - Elderly



Home Snapshot: Belle Haven

Multiple health & safety issues: Dust, poor IAQ, poor venting, damaged roof, damaged smoke detector



Home Snapshot: Belle Haven

Hayward Score of **54**

3 People in Household - 6 year old w/ allergies



Sensitivities

- **Chronic Inflammatory Response Syndrome (CIRS)**

- ▶ CIRS-WDB (Water Damaged Buildings)
- ▶ CIRS-PLD (Post Lyme Disease)

- **Asthma**

- **Sick Building Syndrome**

- ▶ The sick building syndrome (SBS) is used to describe a situation in which the occupants of a building experience acute health- or comfort-related effects that seem to be linked directly to the time spent in the building.

- **Fungal infection (mold) affecting the lungs and sinus)**

- ▶ Occurs in people with underlying illnesses such as tuberculosis or chronic obstructive pulmonary disease (COPD), but with otherwise healthy immune systems.
- ▶ Aspergillosis, Mycosis, etc.

- <https://internalmedicinereview.org/index.php/imr/article/view/718>

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2796751/>

What's in the air?

Biological

- ▶ Dust mites
- ▶ Cockroaches
- ▶ Fungus (mold)
- ▶ Rodents
- ▶ Birds (attic areas)

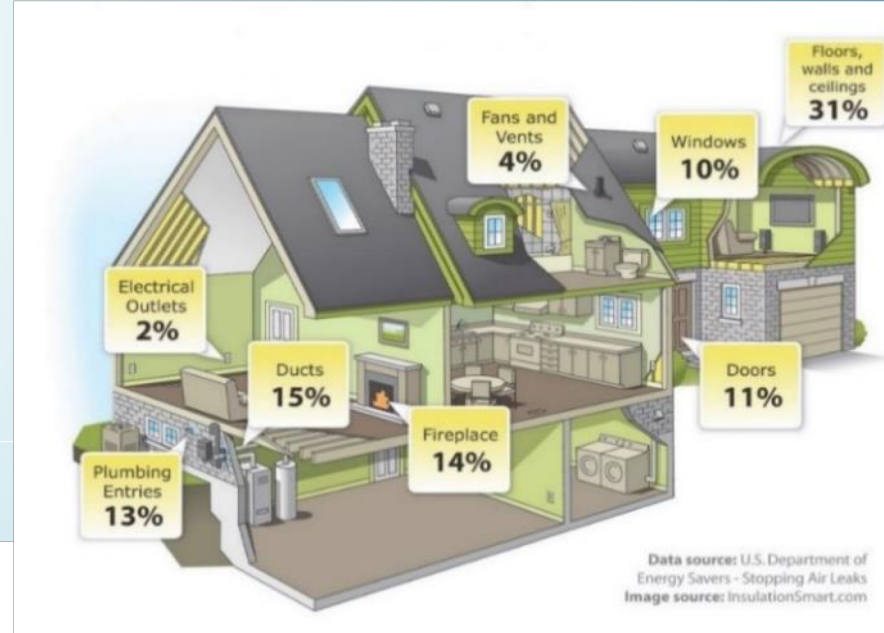
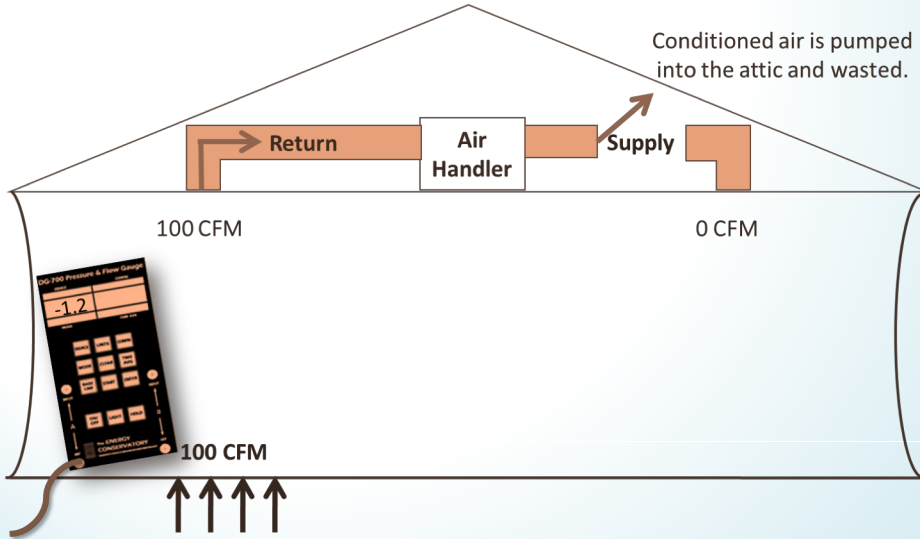


Chemical

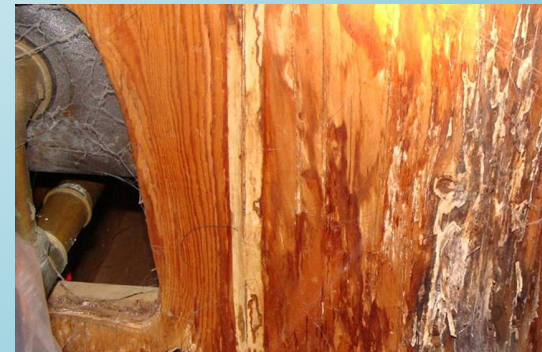
- ▶ Asbestos
- ▶ Lead
- ▶ Pesticides
- ▶ Volatile Organic Compounds (VOCs)



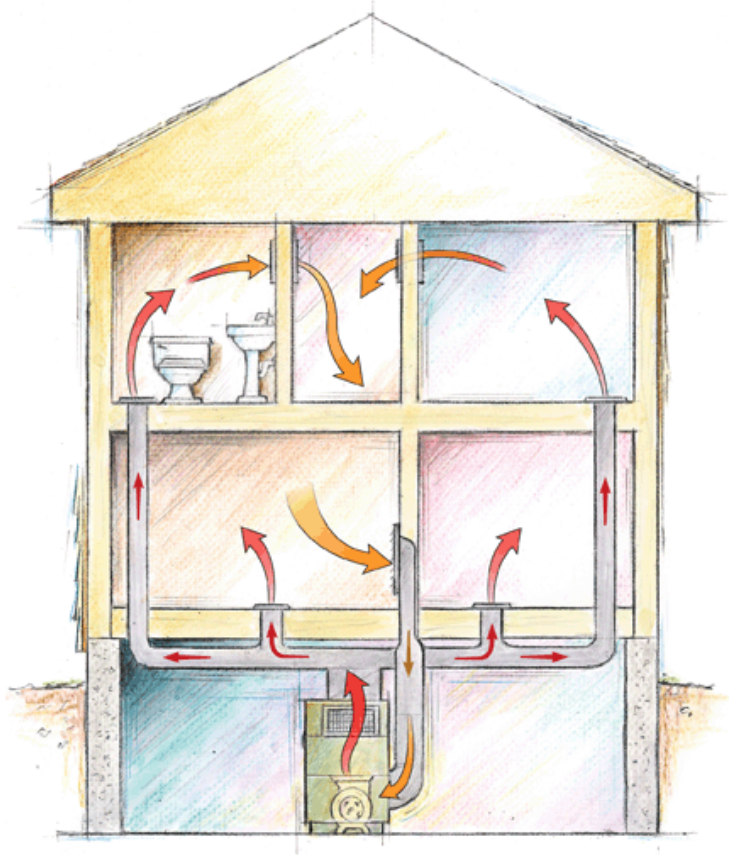
Uncontrolled air movement



The stack effect



Controlled air movement



The air in the ducts is the air in the living area and vice versa, an optimal system is a closed loop.

When both the duct system and the shell of the home are well sealed then the air can be effectively filtered, and sources can be controlled.

Relative to energy efficiency, equipment cycles less often saving energy, if the equipment is “right sized” then run times are longer and less frequent which improves filtration.

Contaminate source control



Building Performance Institute, Inc.
BPI Standards



8.3.1 Recommend the removal of indoor air pollutants sources identified in BPI-1100, Section 8.1, or implementation of other source control measures.

8.3.2 Sealing, gasketing, or weatherstripping all leaks between an attached or tuckunder garage and the house shall be recommended, including specific leakage paths as identified in BPI-1100, Section 8.2.

8.3.4 Sealing of air handler units and ducts that are located outside the pressure boundary shall be recommended.

8.3.5 For ducts located outside the pressure boundary, recommend R-8 insulation, at a minimum.

<https://exams.bpi.org/site/resources/public/online-testing/ANSI-BPI-1200-S-2015-Standard-Practice-for-Basic-Analysis-of-Buildings.pdf>

CDC & National Center for Healthy Housing (NCHH) 2009

Table 1. Summary of Intervention Findings

Panel	Sufficient Evidence	Needs More Field Evaluation	Needs Formative Research	No Evidence or Ineffective
Panel 1: Interior Biological Agents (Toxins)	<ul style="list-style-type: none"> • Multi-faceted tailored asthma interventions • Integrated Pest Management (allergen reduction) • Moisture intrusion elimination 	<ul style="list-style-type: none"> • Dehumidification • General & local exhaust ventilation (kitchens & baths) • Air cleaners (to reduce asthma) • Dry steam cleaning • Vacuuming 	<ul style="list-style-type: none"> • Carpet treatments • One-time professional cleaning • Acaracides 	<ul style="list-style-type: none"> • Bedding encasement alone • Sheet washing alone • Upholstery cleaning alone • Air cleaners releasing ozone
Panel 2: Interior Chemical Agents (Toxics)	<ul style="list-style-type: none"> • Radon air mitigation through active subslab depressurization • Integrated Pest Management (pesticide reduction) • Smoking bans • Lead hazard control 	<ul style="list-style-type: none"> • Radon mitigation in drinking water • Portable HEPA air cleaners to reduce particulate • Attached garage sealing to limit VOC intrusion • Particulate control by envelope sealing 	<ul style="list-style-type: none"> • Radon air mitigation using passive systems • Improved residential ventilation • VOC avoidance 	<ul style="list-style-type: none"> • Portable HEPA air cleaners to reduce environmental tobacco smoke and formaldehyde • Air cleaners using or releasing ozone • Single professional cleaning to reduce long-term lead exposure

<http://www.nchh.org/LinkClick.aspx?fileticket=2lvaEDNBldU%3d&tabid=229>

Cost of patient treatment

Asthma Costs the U.S. Economy More than \$80 Billion Per Year

- The annual per-person medical cost of asthma was **\$3,266**. Of that, \$1,830 was for prescriptions, \$640 for office visits, \$529 for hospitalizations, \$176 for hospital outpatient visits and \$105 for emergency room care.

In order to reduce asthma-related ER visits, hospitalizations, absenteeism and mortality, **we need to support guidelines-based care, expand self-management education and reduce environmental asthma triggers at homes.”**

Dr. Tursynbek Nurmagambetov
CDC’s National Asthma Control Program

American Thoracic Society, 2018

<https://www.thoracic.org/about/newsroom/press-releases/journal/asthma-costs-the-us-economy-more-than-80-billion-per-year.php>

Cost of home improvement

Costs of efficiency measures that effect Indoor Air Quality (IAQ)

Building shell air sealing	\$2,000.00
Controlled contaminates	
• Outdoor air pollution	
• Pest related contaminates	
• Rodents, cockroaches, birds	
Replacement windows	\$4,500.00
(Air sealing measure)	
Replacement air ducts	\$3,800.00
Greatly reduces depressurization	
Sealed combustion natural gas burning furnace (95% efficient)	<u>\$4,200.00</u>
Reduces depressurization	
	\$14,500.00

* California Market, 1800 sq ft single story home, raised foundation

Exemplary programs

A free online self assessment survey service is available at;

<https://www.haywardscore.com/>

Vermont One Touch

508-358-7770

<https://onetouchhousing.com/contact-us/>

EnergyFIT Philly

215-609-1000

<https://www.ecasavesenergy.org/about/contact-eca>

Green & Healthy Homes Initiative

(6 locations nationwide)

800-370-5323

<https://www.greenandhealthyhomes.org/contact-us/>

BIG