

Your HOME can be

Science-based
GUIDE to home
improvements

HEALTHY, RESILIENT, ECO-FRIENDLY

Home Improvements: The Path to a Healthy, Resilient, Clean-Energy Home

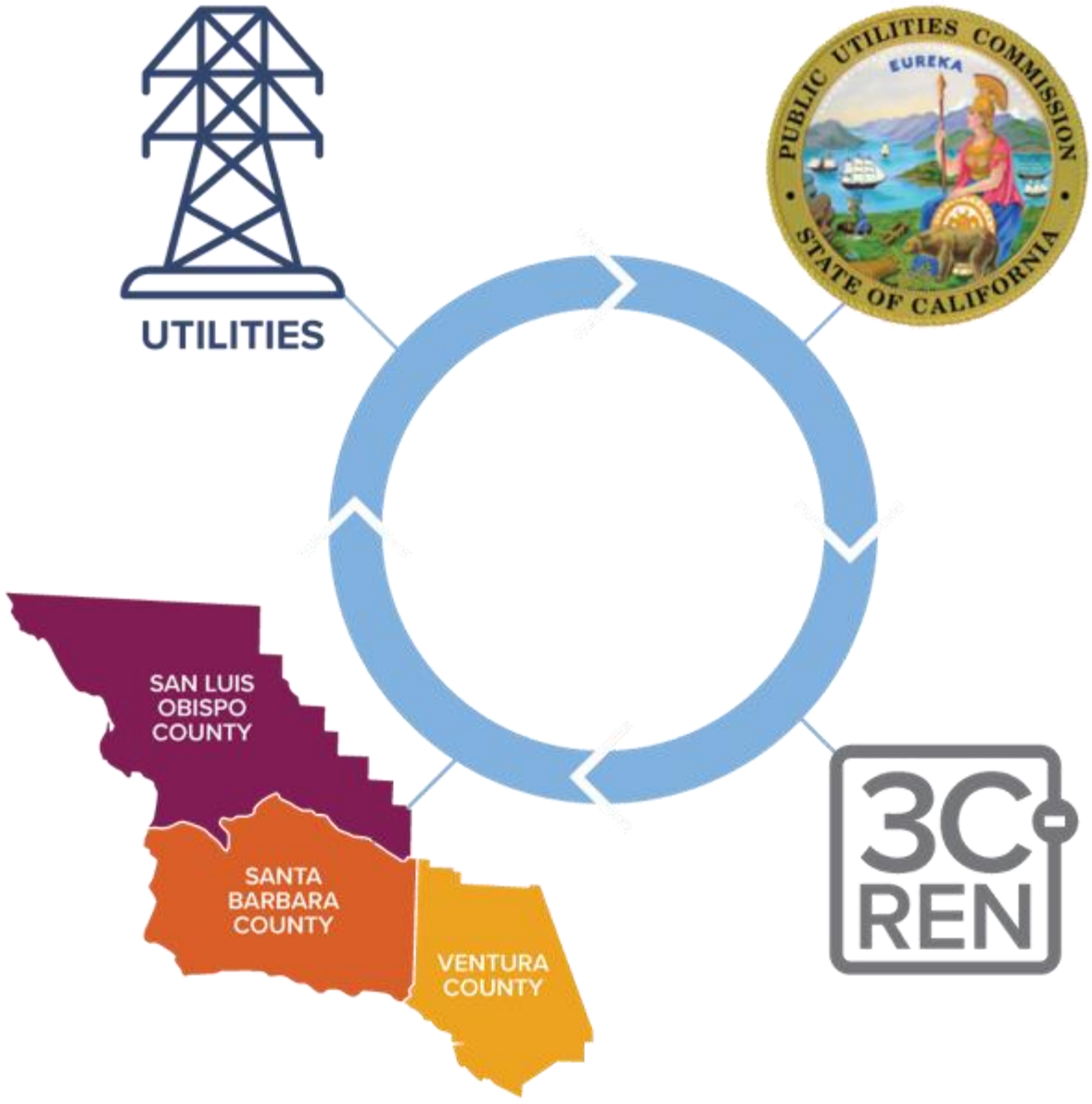
^{*}A Homeowner's One Page Guide

Presented by Debra Little for 3C-REN 5/27/2026
debralittle1@gmail.com

Before We Begin

Here are some quick reminders:

- Call in? Please **share** full name to confirm attendance
- To receive AIA LUs, you **must attend** at least 80% of the training. Attendance will be verified
- Use the "**Chat**" to share questions or comments
- Slides/recording are **shared** after most events and can be found on 3C-REN's on-demand page
- 3C-REN does **not** allow **AI notetakers**, unless used to accommodate a disability



Tri-County Regional Energy Network

3C-REN is a collaboration between the tri-counties

Our programs reduce energy use for a more sustainable, equitable and economically vibrant Central Coast

Our free services are funded via the CPUC, bringing ratepayer dollars back to the region

Our Services

Incentives



HOME ENERGY SAVINGS

3c-ren.org/for-residents
3c-ren.org/multifamily



COMMERCIAL ENERGY SAVINGS

3c-ren.org/commercial

Contractors can enroll at
3c-ren.org/contractors

Training



BUILDING PERFORMANCE TRAINING

3c-ren.org/events
3c-ren.org/building



ENERGY CODE CONNECT

3c-ren.org/code

View past trainings at
3c-ren.org/on-demand

Technical Assistance



AGRICULTURE ENERGY SOLUTIONS

3c-ren.org/agriculture



ENERGY ASSURANCE SERVICES

3c-ren.org/assurance

Available Incentives for Home Energy Upgrades!



Home Energy Savings

~ \$750/\$1,500

3c-ren.org

Available for Tri-County residents.

- Most energy-saving projects* qualify
- Incentives available through 3C-REN enrolled contractors
- Incentive amounts based on energy savings
- Must be located in 3C-REN territory (SLO, SB, Ventura)
- Must receive gas and/or electric service from PG&E, SoCalGas, or SCE

www.3c-ren.org/for-residents/

Have Any Questions? Contact Our Concierge!



3C-REN Incentive Concierge – English Support

Naomi Newman

Call or Text: (805)568-2458

Email: nnewman@3C-REN.org



3C-REN Incentive Concierge – Spanish Support

Itzel Torres

Call or Text: (805)767-1204

Email: info@3C-REN.org

3-COURSE SERIES

October 2026

- 1 Solar PV: Technology and Valuation
- 2 Carbon Free Homes: Features, Benefits, Valuation
- 3 Clean Energy Homes: How Realtors earn stellar referrals while boosting profits
- 3 High Performance Homes Val 2

ajo.earth/classes/



EXPERTISE

Efficient
Clean-Energy
Homes

Certificate of Completion
3-Course Series
Efficiency, Solar,
Valuation,
Sales

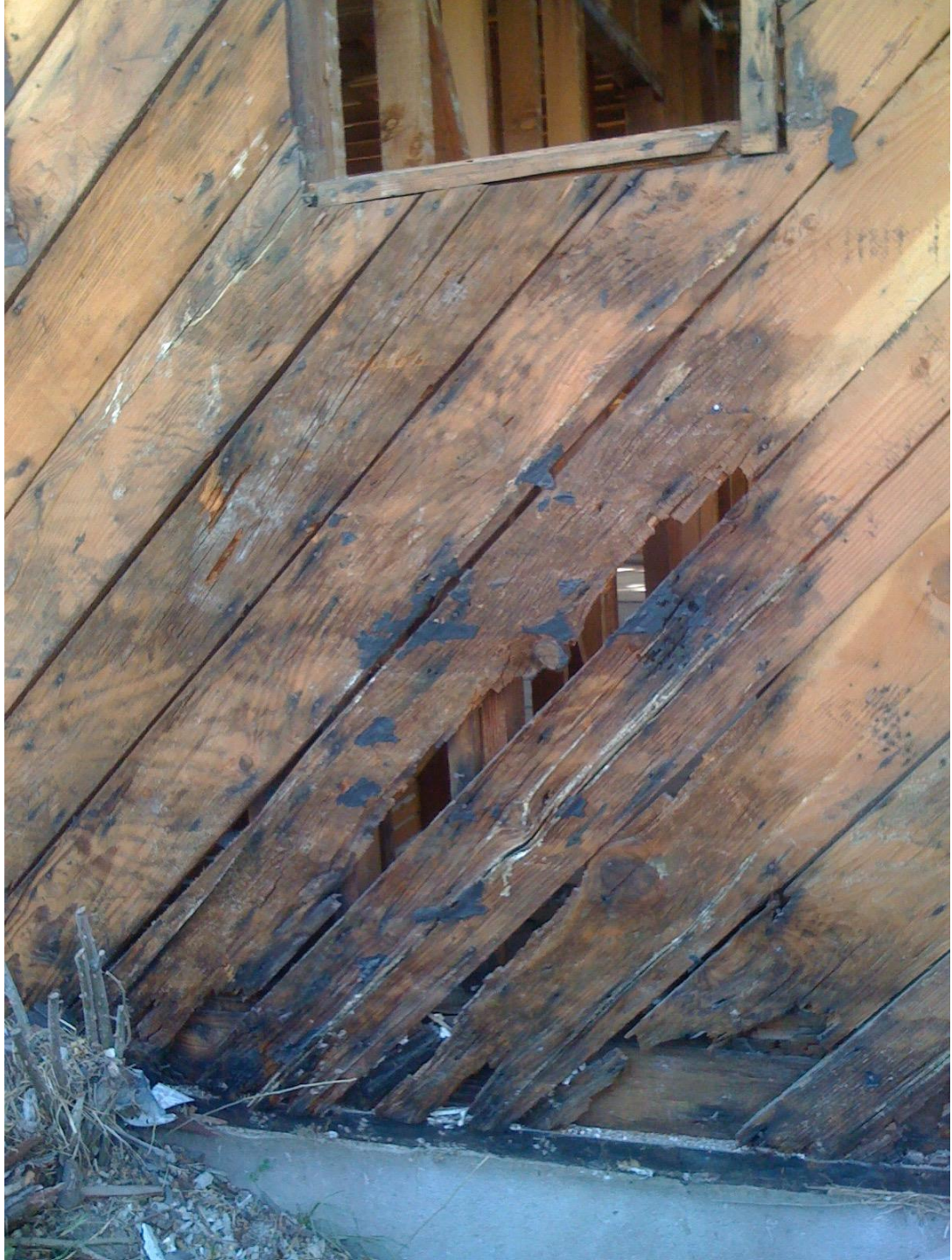








R80











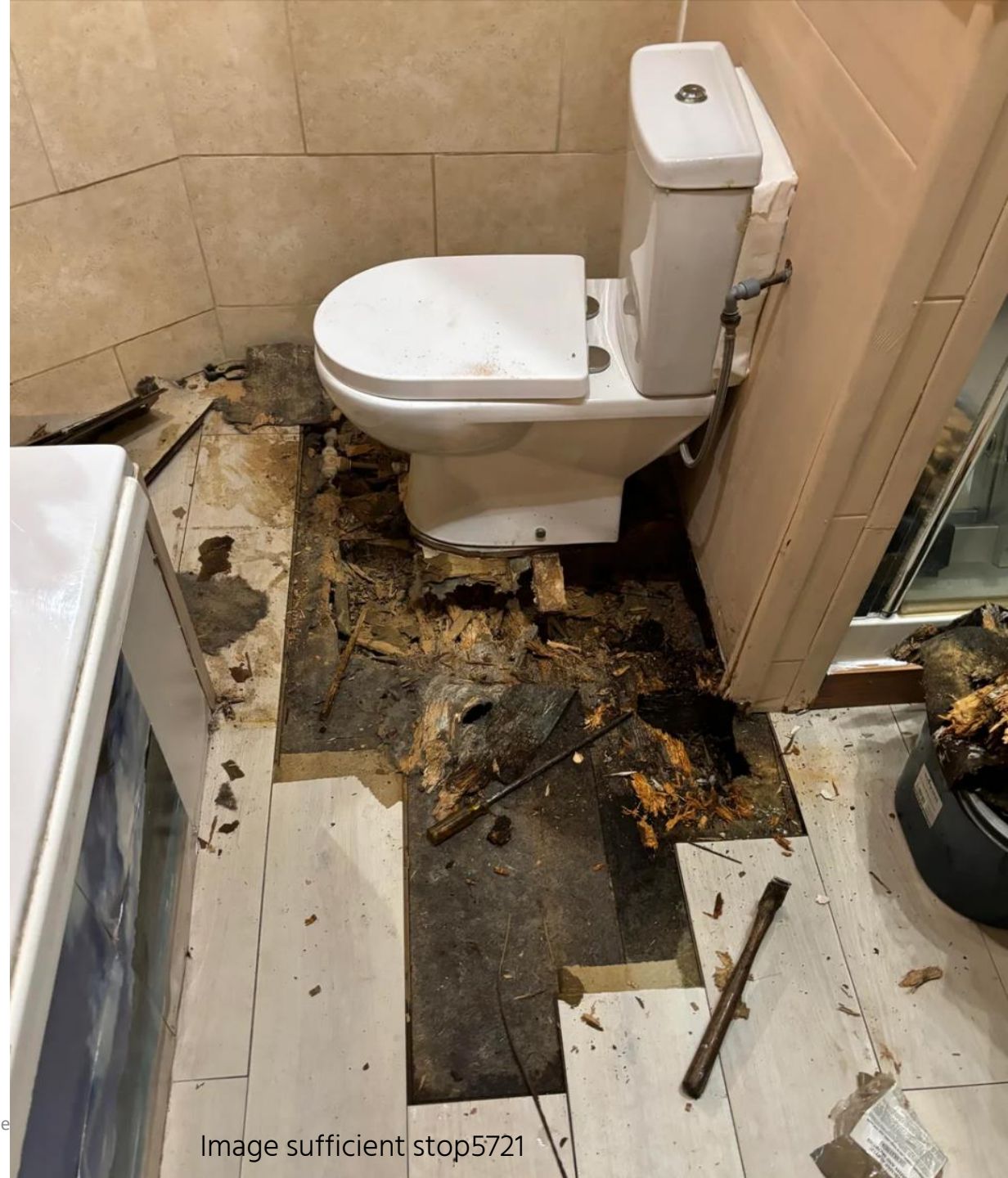








Too often
small projects turn into
unfortunate surprises!

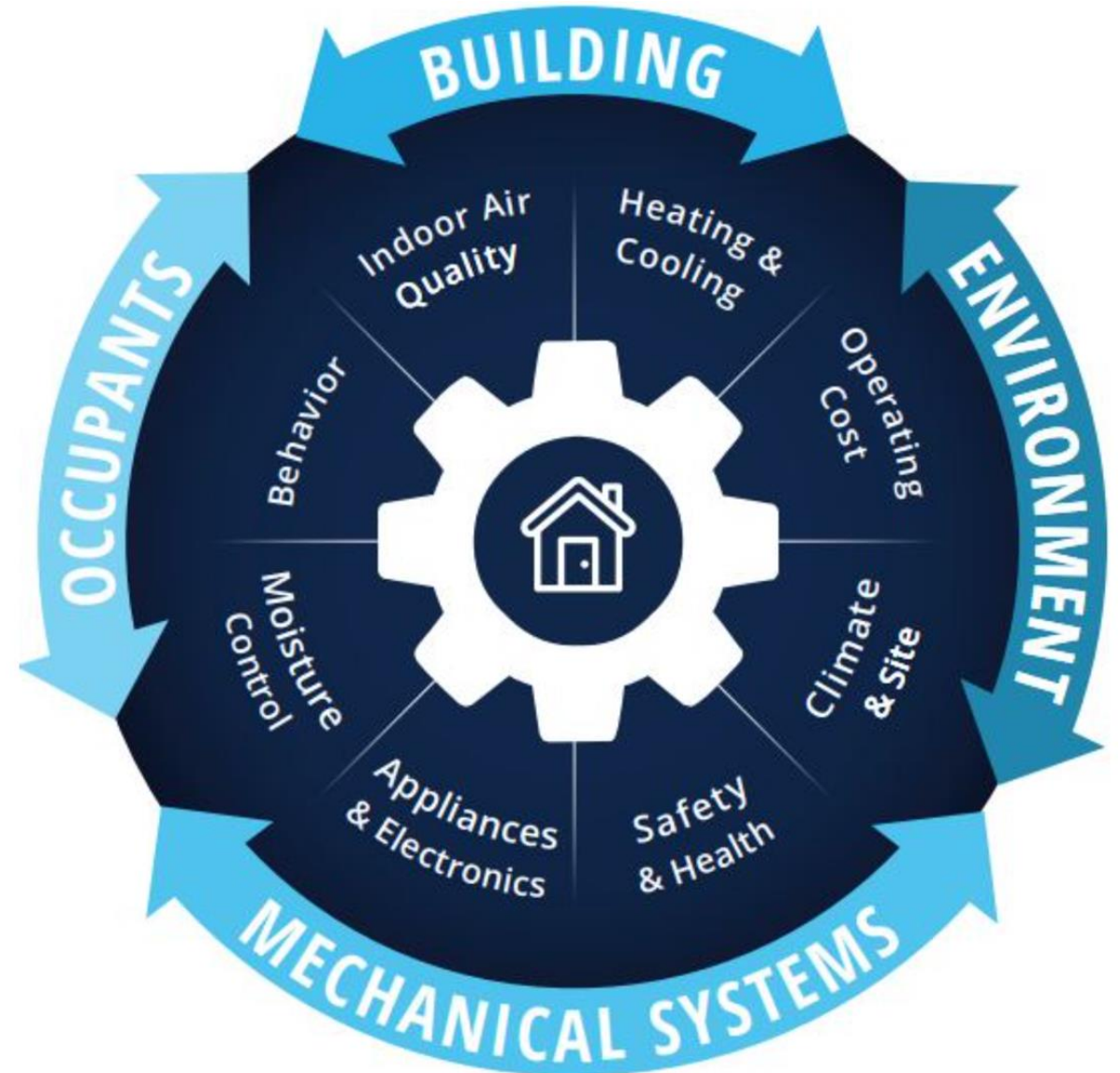


3 Pillars of Home Performance

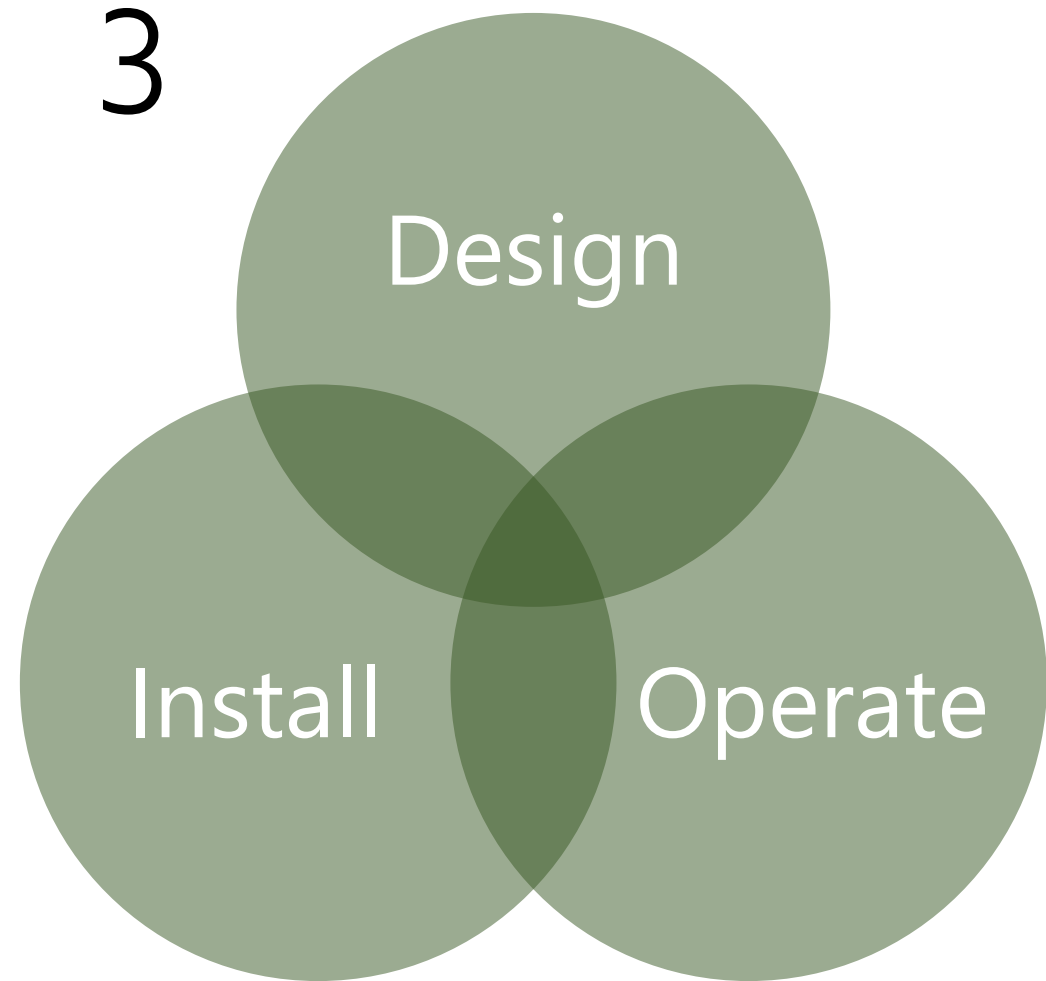
1 HOUSE
as a
SYSTEM

Ask Qs

What if?



2
MEASURED
Performance



Excellence in each is essential for optimized results

What home improvements do **you** have in mind?

What topics are you hoping to learn more about?



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PLANNING HOME IMPROVEMENTS?



From tiny to extensive projects, it's helpful to be informed by performance principles

This guide spotlights key steps in your path to enjoy these ...

BENEFITS

- Quality of life
- Health
- Energy savings
- Superior comfort, quality & durability
- Resilience in power losses, extreme events

Your guide to a clean energy home

Prioritize Efficiency!

1. Optimize existing home **structure** by improving efficiency
2. Switch gas **appliances** to electric
3. Power your home with **solar**

Control Air Movement

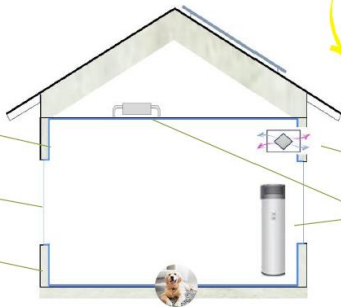
Most homes have random leaks. Air **seal** to limit the flow of air, moisture, heat, pollutants.

Windows

Replace single-paned to improve comfort, save energy

Increase Insulation

Most homes are under insulated (DOE). Adequate insulation supports comfort, durability, resilience, efficiency.



Summer



Winter

Reduce Heat Risks

Add shading strategies. Design awnings or eaves to block summer sun when it's at higher angles (lower winter sun can help heat home). Plant shade trees.

Improve Air Quality

Deliver fresh filtered air with an efficient system such as a heat recovery ventilator.

Solar + Batteries

Reduce climate impacts and long-term expenses while increasing resilience.



Heat Pumps
Heating, cooling & hot water

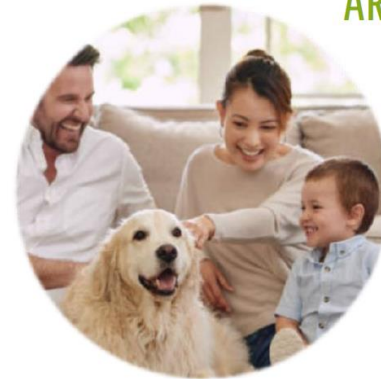
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HEALTHY, RESILIENT, ECO-FRIENDLY

CONCERNED ABOUT CLIMATE CHANGE?

ARE YOU ASKING "What can I do?"



Our climate actions can start with our homes!

Improve your home & enjoy these ...

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- Quality of life
- Lower climate impact
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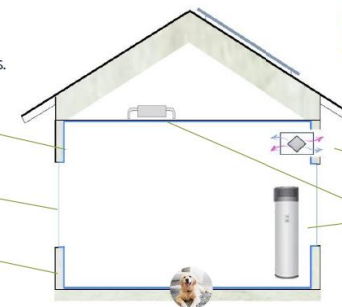
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90% of homes are under insulated (DOE). Adequate insulation supports comfort, durability, resilience, efficiency.



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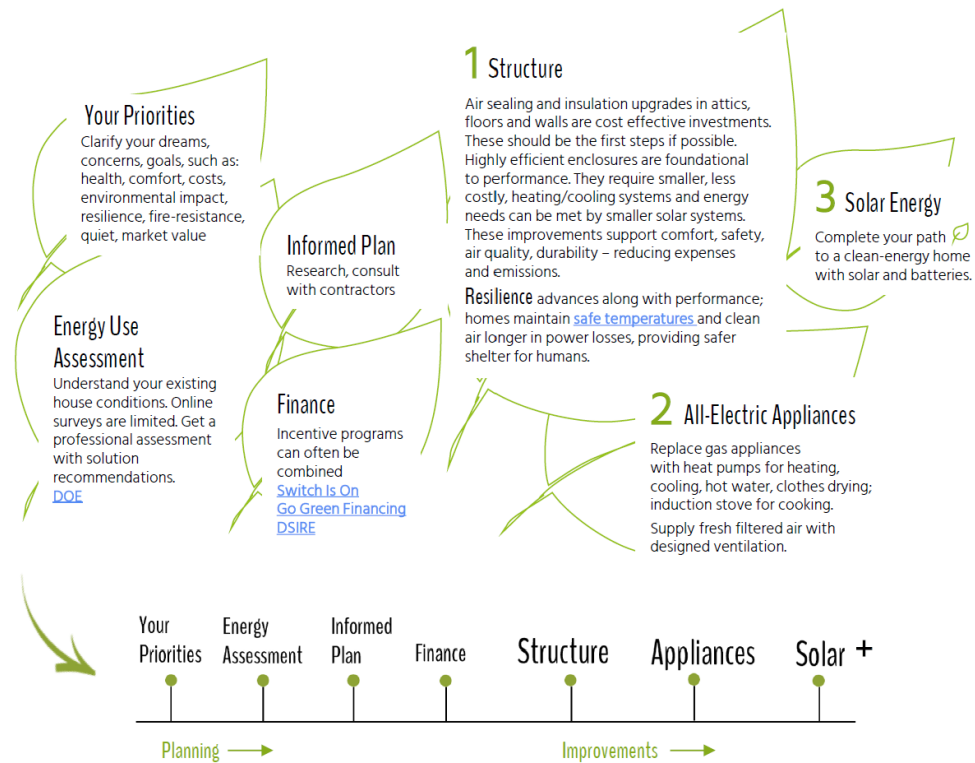
Solar + Batteries

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Heat Pumps
Heating, cooling & hot water

Back /pg2



Contact DL@AJOearth - Debra Little, Ann Edminister



Access live links → <https://ajo.earth/homeowners-guide/>

Airtight Structure
Air seal surfaces, connections, and penetrations. This is a priority for higher performance. Variety of effective sealants and strategies. Prevents moisture damage, heat/cool/energy losses, deterioration, drafts, intrusion of pollutants, smoke. Supports comfort, air quality, efficiency, durability. [DOE](#) [PassiveHsAccel](#)

Insulation
Most homes are under-insulated. Install adequate levels; many regions benefit from above-code R values. Choose types for human health and check for [toxicity](#). The quality of [installation](#) is vital to insulative effectiveness. Well insulated homes are more durable, comfortable, efficient, resilient, quiet. [DOE](#) [Insulation Institute](#)

Heating, Cooling, Hot Water
[Heat Pumps](#), do it all! Instead of using energy to generate heat, they *move* existing heat as refrigerators do, so are 3-5 times more efficient. Replace gas appliances with electric HPs. They're safer, cleaner, reduce pollutants and fire risk. [CarbonBrief](#) [IEA](#) [HP Water Heaters](#) can be timed to save \$, emissions – a clean E [battery!](#)

Healthy Air
Pollutants indoors can be 100+ times worse than outdoors with potential ill health [effects](#). Of most [concern](#) are [particles](#) and NO2. Prevent contaminants from entering (air tightness, no gas, filtration), then maintain ongoing air quality. Provide fresh filtered air via

- [Heat Recovery Ventilator](#), or
- Balanced exhaust/supply with filtration

Healthy Kitchens
[Cooking](#) produces pollutants, but far more with [gas](#) (NO2, CO, particles...), increasing [risk](#) of asthma, cancer, respiratory and cognition problems. [Induction](#) stoves are safer, precise, efficient. Effective exhaust is critical but many [range fans](#) are inadequate - have yours tested! Open windows when possible.

Healthy Materials
Healthy homes are vital to human thriving and well-being, yet some commonly used materials bring health [risks](#): asthma, cognitive decline, infertility, cancer. Some release [chemicals](#) by off-gassing and degradation which can interact to produce other toxins. Choose [safer](#) options. [Resources](#) for healthier [materials](#).

Water Efficiency
Water is a precious resource and there are many ways to reduce waste. Increase [efficiency](#) by installing low-flow [fixtures](#) and auto-controlled irrigation. Plant climate-specific landscaping and minimize lawns. Consider [Rain catchment](#). If it takes a long time for hot water to arrive to a fixture, install an on-demand [recirculation](#) pump or improve [distribution](#)

Solar + Batteries
Complete your path to a clean-energy home with [solar](#) plus batteries or choose a 100% renewable energy option through a local provider. When considering size, account for future changes such as efficiency improvements or electric car. Timing of use and other control strategies can further reduce size and grid dependence.

TO FURTHER REDUCE HOUSEHOLD EMISSIONS Electric car, lawnmower... avoid plastics, food & lifestyle choices mindful of climate impacts. **EVERY INDIVIDUAL ACTION MATTERS!**

Why I created this guide for homeowners

1. Focus on electrification often left out enclosures
2. People asking “What can I do?”
...about climate change as an individual

Intent

To provide a descriptive path to increasing performance and reducing emissions informed by the building science, whole-house approach. While not exhaustive, the aim is to raise awareness of the complete A-Z considerations and equip HOs with [sources for continued learning](#) in a short take-away info sheet.

The Energy Transition

RENEWABLES

Energy source

Fossil fuels → Renewables

2025 Outpaced new global elect. demand

ELECTRIFICATION

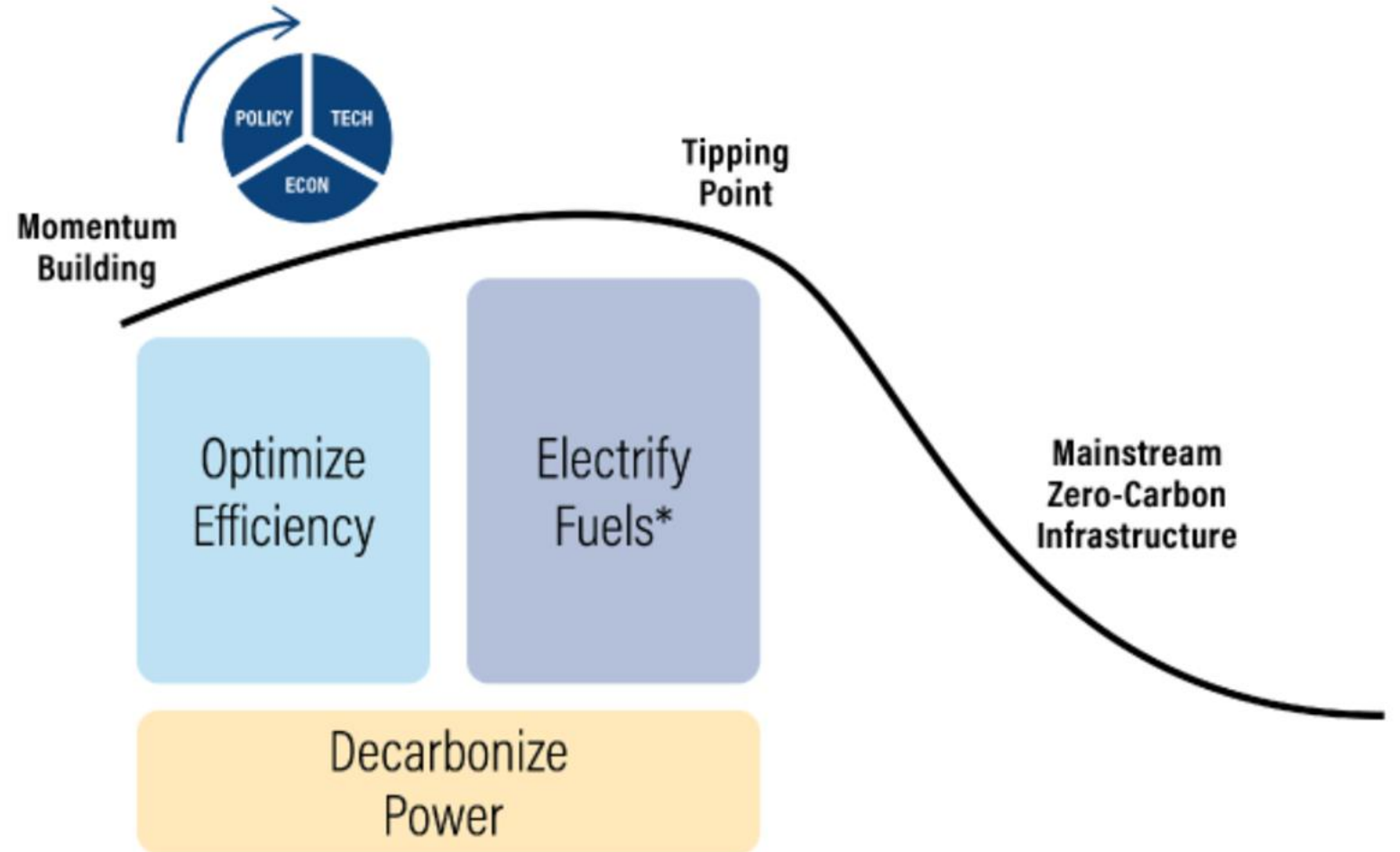
End uses electrified

Transport – Buildings – Industry

Without electrification, where will renewable energy go?

HOMES

1. Optimize
2. Electrify
3. Clean Energy



The powerful One Page Concept



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- Quality of life
- Lower climate impact
- Health
- Resilience in power losses, extreme events
- Superior comfort, quality & durability
- Energy savings

Your guide to a clean energy home

Prioritize Efficiency!

1. Optimize existing home structure by improving efficiency
2. Switch gas appliances to electric
3. Power your home with solar

Control Air Movement
Most homes have random leaks. Air seal to limit the flow of air, moisture, heat, pollutants.

Windows
Replace single-paned to improve comfort, save energy

Increase Insulation
Most homes are under insulated (DOE). Adequate insulation supports comfort, durability, resilience, efficiency.



Reduce Heat Risks
Add shading strategies. Design awnings or eaves to block summer sun when it's at higher angles (lower winter sun can help heat home). Plant shade trees.

Improve Air Quality
Deliver fresh filtered air with an efficient system such as a heat recovery ventilator.

Heat Pumps
Heating, cooling & hot water

Solar + Batteries
Reduce climate impacts and long-term expenses while increasing resilience.

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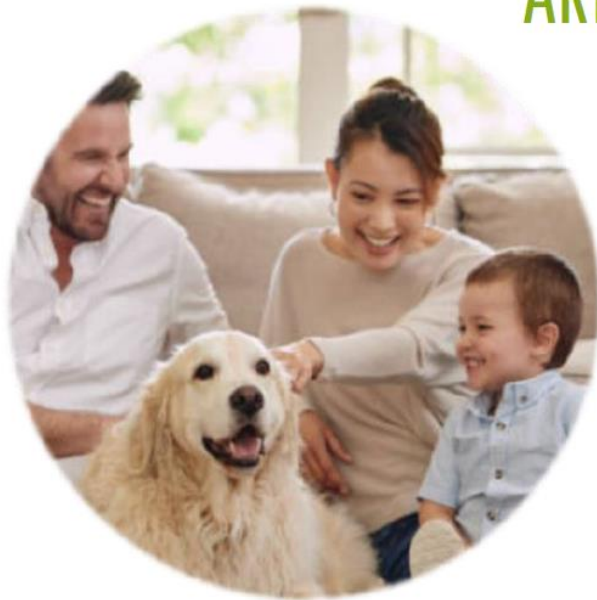
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- Lower climate impact
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- Superior comfort, quality & durability
- Energy & utility savings

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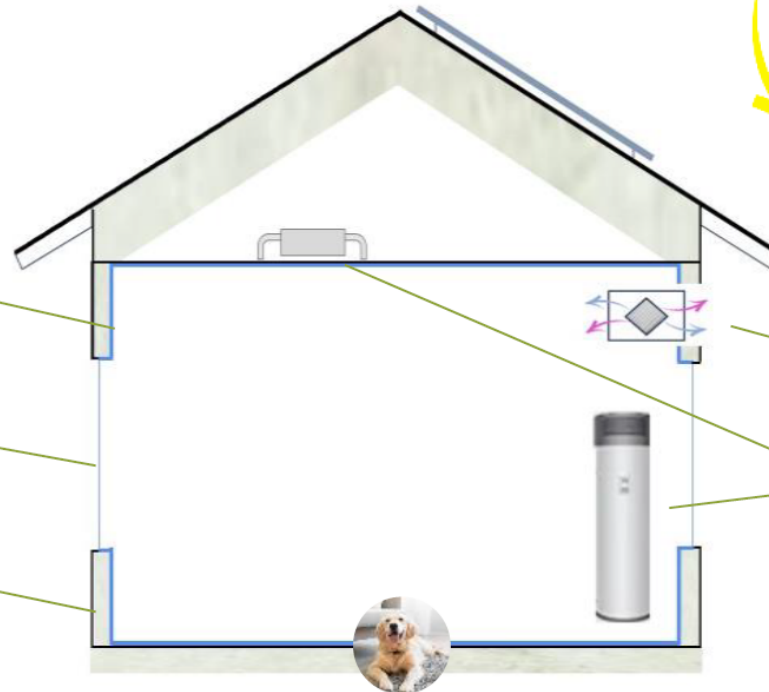
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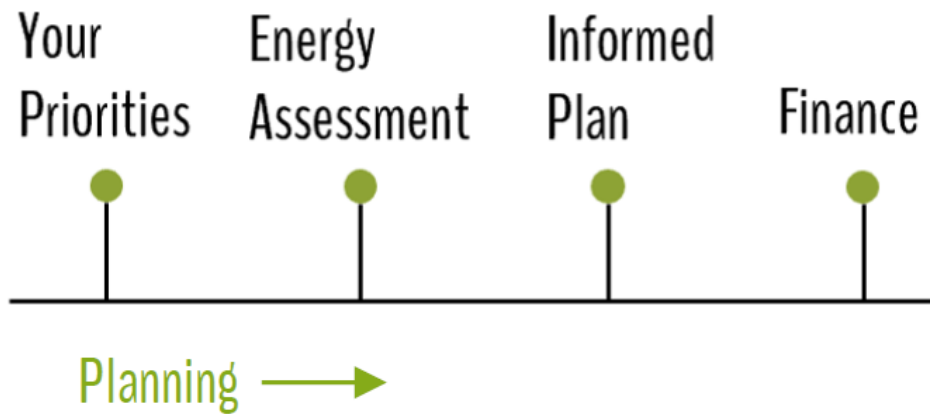
Solar + Batteries

Reduce climate impacts and long-term expenses while increasing resilience.

Homeowners

So far...

What highlights resonated
about your own home?



Your Priorities

Clarify your dreams, concerns, goals, such as: health, comfort, costs, environmental impact, resilience, fire-resistance, quiet, market value

Energy Use Assessment

Understand your existing house conditions. Online surveys are limited. Get a professional assessment with solution recommendations.

[DOE](#)

Informed Plan

Research, consult with contractors

Finance

Incentive programs can often be combined

[Switch Is On](#)
[Go Green Financing](#)
[DSIRE](#)



Your Priorities

Clarify your dreams, concerns, goals, such as: health, comfort, quiet, environmental impact, resilience, fire-resistance, costs, market value

What are YOURS?

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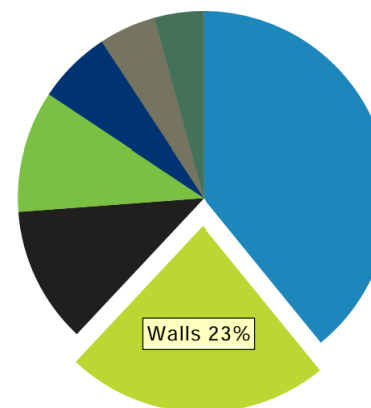
A professional energy assessment can provide an expertly designed roadmap to saving money and improving the comfort of your home.

Finding and Selecting an Energy Assessor

Preparing for an Energy Audit

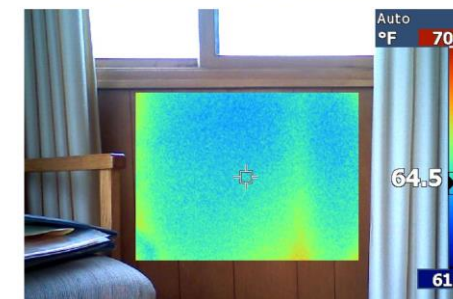
The Audit Process and Recommendations

Energy lost by walls, on the coldest night of the year in your area



Photos of Your Wall Insulation

Using an infrared camera and a wooden probe, I determined your exterior walls are not insulated. Insulating them would yield large efficiency improvements and increased comfort. This IR photo shows how the uninsulated wall cavities lose heat quicker than the studs. However, you have indicated that wall insulation is not a priority for you at this time.





U.S. DEPARTMENT OF **ENERGY**

THIS HOME'S SCORE **4** OUT OF 10

THIS HOME'S ESTIMATED ENERGY COSTS

\$1,688 PER YEAR

HOME PROFILE

LOCATION:
5909 NE 25th Ave
Portland, OR 97211

YEAR BUILT:
1942

HEATED FLOOR AREA:
2,300 sq.ft.

NUMBER OF BEDROOMS:
3

ASSESSMENT

ASSESSMENT DATE:
10/14/2020

SCORE EXPIRATION DATE:
10/14/2028

ASSESSOR:
Donald McGee
Home Synergy Solutions LLC

PHONE:
503-381-3159

EMAIL:
donaldjmcgee@gmail.com

LICENSE #:
218308

Better Buildings' Home Energy Score

Official Assessment | ID# 323910

The Home Energy Score is a national rating System developed by the U.S. Department of Energy. The Score reflects the estimated energy use of a home based upon the home's structure and heating, cooling, and hot water systems. The average score is a 5. Learn more at HomeEnergyScore.gov.

HOW MUCH ENERGY IS THIS HOME LIKELY TO USE?

Electric: 8,930 kWh/yr. \$1,097

Natural Gas: 629 therms/yr. \$591

Other: \$0

Renewable Generation: (\$0)

TOTAL ENERGY COSTS PER YEAR \$1,688

How much renewable energy does this home generate?

_____ kWh/yr

THIS HOME'S CARBON FOOTPRINT:

What should my home's carbon footprint be? Between now and 2030, Portlanders should reduce carbon pollution per household to 3 metric tons per year to reach our climate goals.

- Actual energy use and costs may vary based on occupant behavior and other factors.
- Estimated energy costs were calculated based on current utility prices (\$0.12/kwh for electricity; \$0.94/therm for natural gas; \$2.78/gal for heating oil; \$2.52/gal for propane).
- Carbon footprint is based only on estimated home energy use. Carbon emissions are estimated based on utility and fuel-specific emissions factors provided by the OR Department of Energy.
- Relisting 2-7 years after the assessment date requires a free reprint of the Report from us.greenbuildingregistry.com to update energy and carbon information.
- This report meets Oregon's Home Energy Performance Score Standard and complies with Portland City Code Chapter 17.108.

Flip over to learn how to improve this score and use less energy!

Score today: 4	Score with priority improvements: 6	Estimated energy savings with priority improvements: \$159 PER YEAR	Estimated carbon reduction with priority improvements: 11% PER YEAR
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TACKLE ENERGY WASTE TODAY!
Enjoy the rewards of a comfortable, energy efficient home that saves you money.

- Get your home energy assessment. Done!
- Choose energy improvements from the list of recommendations below.
- Select a contractor (or two, for comparison) and obtain bids. If a new home, discuss with the builder. Checkout www.energytrust.org/findacontractor or call toll free 1-866-368-7878.
- Explore financing options at communityenergyproject.org or energytrust.org.
- Visit the following resources to learn about easy changes you can make today: communityenergyproject.org/our-services or energytrust.org/solutions/insulation-and-air-sealing/

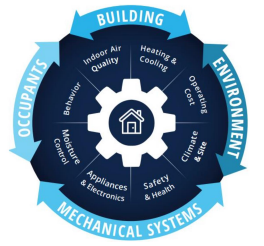
PRIORITY ENERGY IMPROVEMENTS ¹

FEATURE	TODAY'S CONDITION ⁴	RECOMMENDED IMPROVEMENTS ³
Air Conditioner	10 SEER	When replacing, upgrade to ENERGY STAR
Heating equipment	Natural gas furnace 80% AFUE	When replacing, upgrade to ENERGY STAR
Water Heater	Natural gas	When replacing, upgrade to ENERGY STAR, (EF >= 0.67 or UEF >= 0.64)

ADDITIONAL ENERGY RECOMMENDATIONS ²

FEATURE	TODAY'S CONDITION ⁴	RECOMMENDED IMPROVEMENTS
Attic insulation	Ceiling insulated to R-19	Insulate to R-38 or R-49 if code requires it
Envelope/Air sealing	Not professionally air sealed	Professionally air seal
Solar PV	N/A	Visit www.energytrust.org/solar to learn more
Wall insulation	Insulated to R-0	Fully insulate wall cavities
Windows	Multiple types	When replacing, upgrade to ENERGY STAR
Basement wall insulation	Insulated to R-0	
Cathedral Ceiling/roof	Roof insulated to R-30	
Duct insulation	Un-insulated	
Duct sealing	Un-sealed	
Floor insulation	Insulated to R-0	
Foundation wall insulation	N/A	
Skylights	Double-pane	

Find a HOME ENERGY SCORE Assessor in CA
<https://www.bayren.org/find-home-energy-score-assessor>



Answer all relevant questions

Informed Plan

Research, consult
with contractors



Finance

Incentive programs can often be combined

[Go Green Financing](#)
[Switch Is On](#)
[DSIRE](#)

Kickstart your project with GoGreen Financing.

Are you eligible? [See requirements.](#)

1
Make a Plan
[Explore Projects](#)

2
Get an Estimate
[Find a Contractor](#)

3
Find a Great Rate
[Apply for Financing](#)



INCENTIVE LOOKUP FOR CUSTOMERS

93001 Home Function

SEARCH

SEARCH for local incentives by location, specialty and more. **CONNECT** with trusted contractors, in our contractor directory. **ENJOY** the benefits of your new electric appliance.

44 Incentives Available For 93001

Statewide Rebate Save \$4,000 - HEEHRA Rebate - Multifamily Electric Load Service Center

TECH CLEAN CALIFORNIA **HEEHRA** Rebate

REQUIREMENTS

FIND A CONTRACTOR

1. Only available to multifamily properties.
2. Contractor must be TECH-enrolled and HEEHRA-

Database of State Incentives for Renewables & Efficiency®

Find Policies & Incentives Near You

Zip Code



Search

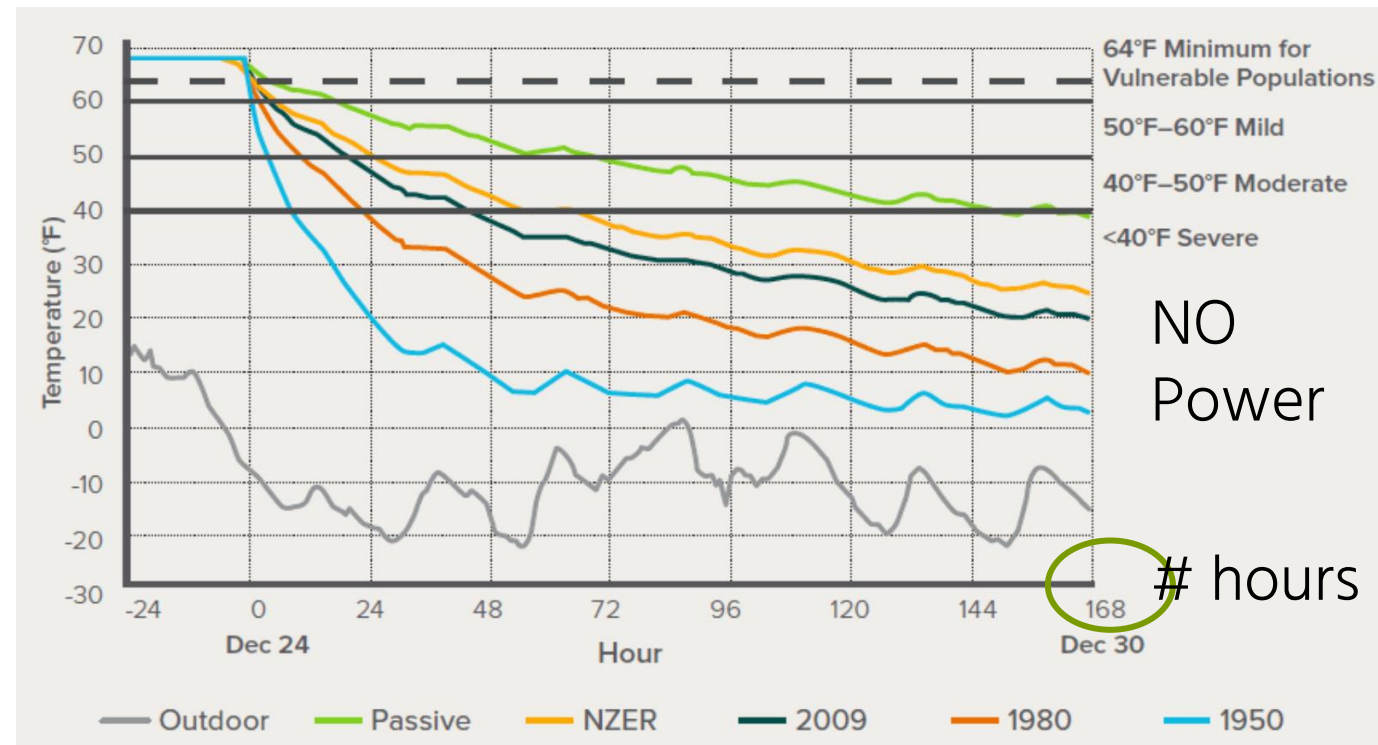
1 Structure

Increase efficiency; primarily through air sealing and insulation upgrades. These should be the first steps if possible. Highly efficient enclosures are foundational to performance, resulting in smaller, less costly heating/cooling system requirements and total energy needs can be met by smaller solar systems. These improvements support comfort, safety, air quality, durability - reducing consumption, emissions, costs.

Resilience advances along with performance; homes maintain safe temperatures and clean air longer without power, providing safer shelter for humans.

Airtightness Insulation

- Orientation
- Use less wood
- **Airtightness**
- **Insulation**
- No thermal bridging
- High perf. windows



PASSIVE
HOUSE

NET ZERO
ENERGY
READY

IECC-code
US AVG

Efficiency First! Reduce before Produce



BENEFITS

HIGH PERFORMANCE STRUCTURE

IMPROVES

Comfort, air quality,
durability, quality, efficiency }
Market value

Quality of life



2 All-Electric Appliances

Replace gas appliances with heat pumps for heating, cooling, hot water, clothes drying; induction stove for cooking.

Supply fresh filtered air with designed ventilation.

Why all-electric?

BENEFITS

Safer – no gas

Healthier air

Interior & exterior

Power w/ clean energy

Efficient - Save \$

Zero emissions

Latest technology

SAFER

Energy and Healthy Home Inspectors find gas leaks
15-30%

Habitat for Humanity Gas leaks in new & existing homes



No gas dangers/pollutants

HEALTHIER

Concentrations of pollutants indoors may be 2-5X higher than outdoors
Occasionally 100X
When cooking with gas up to 400X

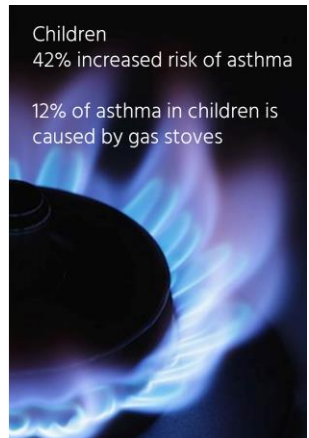
Indoor environments have the largest impact on personal pollutant exposure

Cooking with gas can harm humans, esp. children

- Increases nitrogen dioxide and carbon dioxide levels
- Degrades indoor air quality
- Increases risk of respiratory illnesses, including asthma

"60% of homes with gas stoves interior air pollution levels violate federal standards for outdoor air"

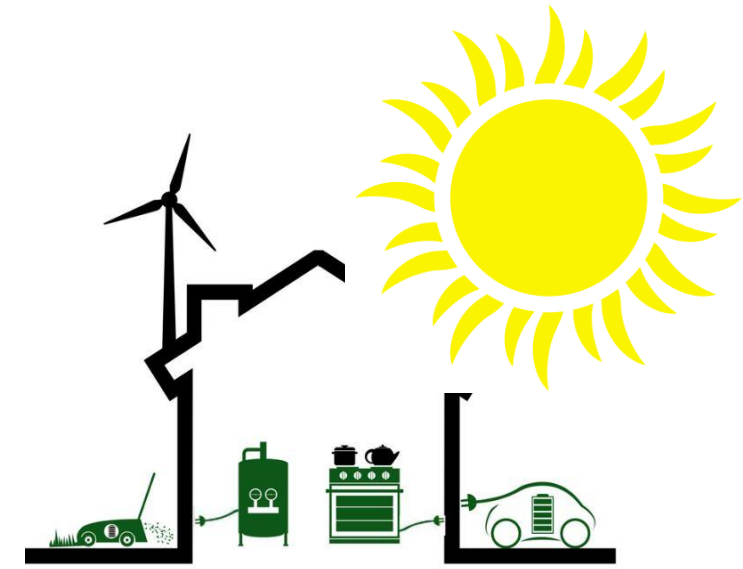
2013 LBNL study



Children
42% increased risk of asthma
12% of asthma in children is caused by gas stoves

THE HILL Oct 20, 2022

Even when off, gas stoves can leak benzene concentrations comparable to secondhand smoke



Induction

Fossil fueled **Buildings** in CA produce 5 X more NOx than all Natural Gas power plants

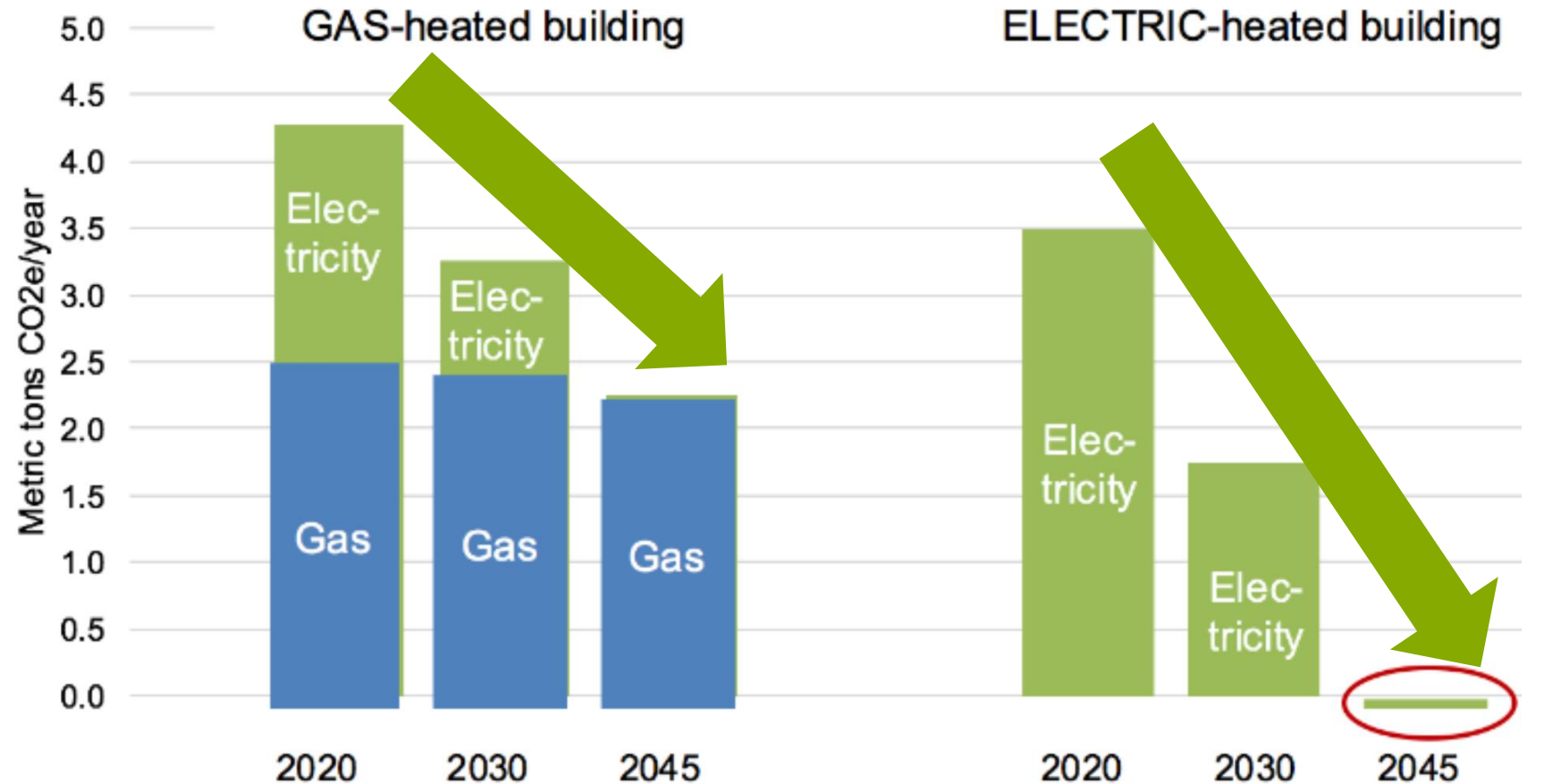
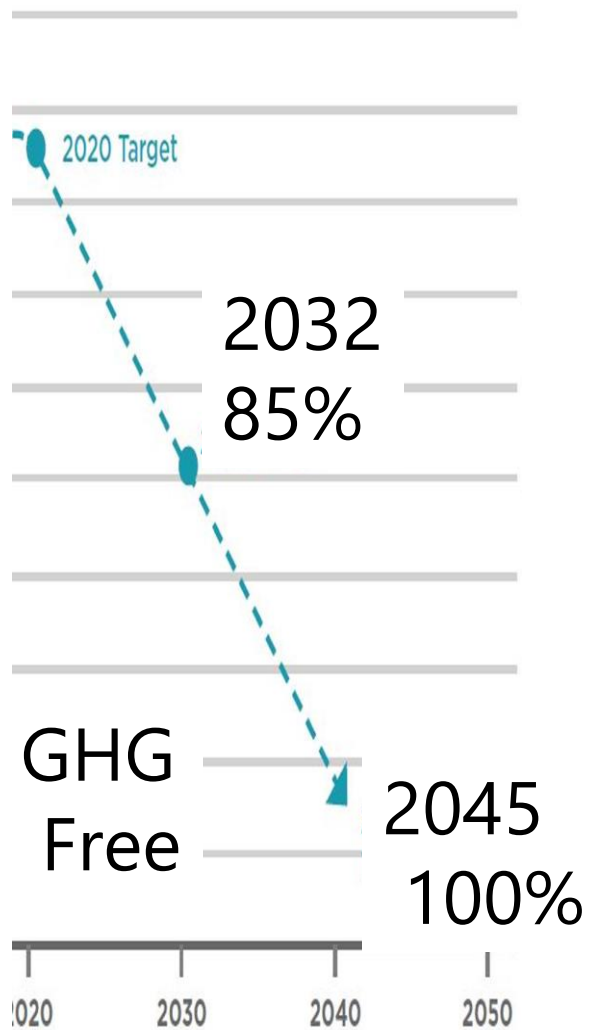


NG Power Plants

Buildings **90% gas**


Cars & Trucks

Annual GHG emissions from Energy use of T24 compliant building

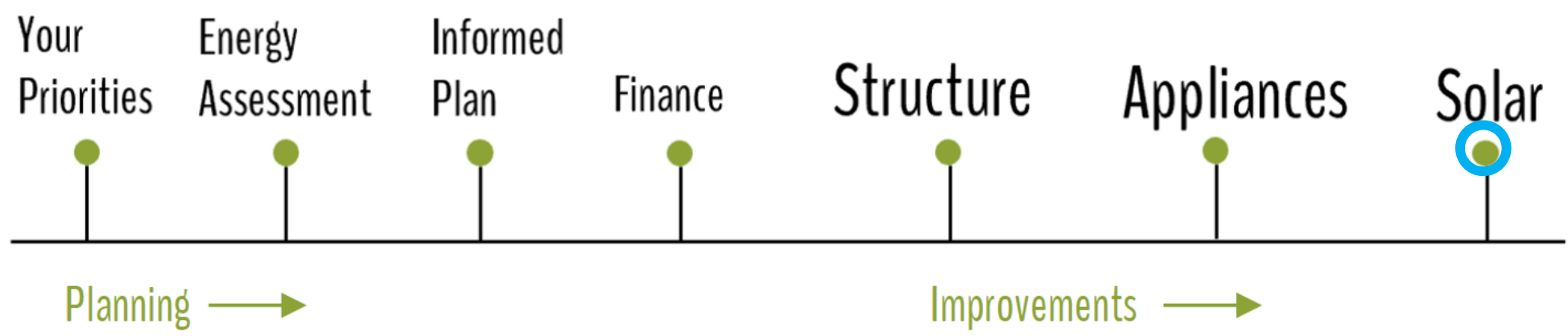


NRDC analysis, climate zone 6 (Los Angeles) with rooftop solar. Including methane leakage.

3 Solar Energy

Complete your path  to a clean-energy home with solar and batteries.





Find a pre-qualified contractor at the [Clean Energy Connection](#)

**CONNECTING CALIFORNIA
HOMEOWNERS TO CLEAN ENERGY
CONTRACTORS**

FIND A CONTRACTOR



High performance assets intrinsically result in healthier environments

Airtight Structure

Air seal surfaces, connections, and penetrations. This is a priority for higher performance. Variety of effective sealants and strategies. Prevents moisture damage, heat/cool/energy losses, deterioration, drafts, intrusion of pollutants, smoke. Supports comfort, air quality, efficiency, durability.

[DOE](#) [PassiveHsAccel](#)

Insulation

Most homes are under-insulated. Install adequate levels; many regions benefit from above-code R values. Choose types for human health and check for [toxicity](#). The quality of [installation](#) is vital to insulative effectiveness. Well insulated homes are more durable, comfortable, efficient, resilient, quiet.

[DOE](#) [Insulation Institute](#)

Heating, Cooling, Hot Water

[Heat Pumps](#) do it all! Instead of using energy to generate heat, they *move* existing heat as refrigerators do, so are 3-5 times more efficient. Replace gas appliances with electric HPs. They're safer, cleaner, reduce pollutants and fire risk.

[CarbonBrief](#) [IEA](#)

[HP Water Heaters](#) can be timed to save \$, emissions – a clean E [battery!](#)

Healthy Air

Pollutants indoors can be 100+ times worse than outdoors with potential ill health [effects](#). Of most [concern](#) are [particles](#) and NO2. Prevent contaminants from entering (air tightness, no gas, filtration), then maintain ongoing air quality. Provide fresh filtered air via

- [Heat Recovery Ventilator](#) or
- Balanced exhaust/supply with filtration

Healthy Kitchens

[Cooking](#) produces pollutants, but far more with [gas](#) (NO2, CO, particles...), increasing [risk](#) of asthma, cancer, respiratory and cognition problems.

[Induction](#) stoves are safer, precise, efficient.

Effective exhaust is critical but many [range fans](#) are inadequate - have yours tested! Open windows when possible.

Healthy Materials

Healthy homes are vital to human thriving and well-being, yet some commonly used materials bring health [risks](#): asthma, cognitive decline, infertility, cancer. Some release [chemicals](#) by off-gassing and degradation which can interact to produce other toxins. Choose [safer](#) options.

[Resources](#) for healthier [materials](#).

Water Efficiency

Water is a precious resource and there are many ways to reduce waste. Increase [efficiency](#) by installing low-flow [fixtures](#) and auto-controlled irrigation. Plant climate-specific landscaping and minimize lawns. Consider [Rain catchment](#).

If it takes a long time for hot water to arrive to a fixture, install an on-demand [recirculation](#) pump or improve [distribution](#)

Solar + Batteries

Complete your path to a clean-energy home with [solar](#) plus batteries or choose a 100% renewable energy option through a local provider. When considering size, account for future changes such as efficiency improvements or electric car.

Timing of use and other control strategies can further reduce size and grid dependence.

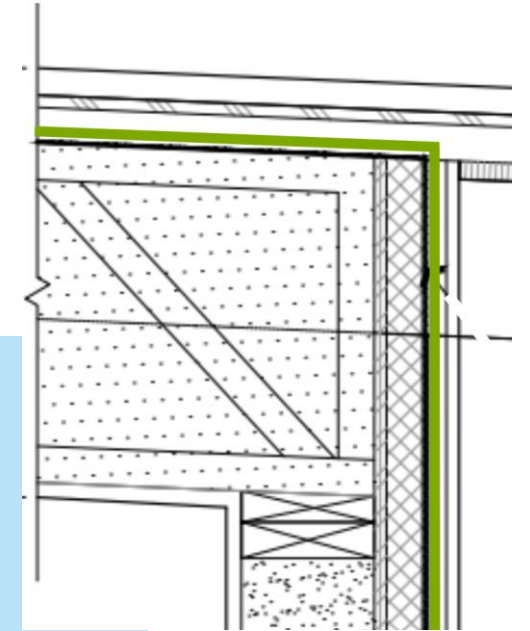
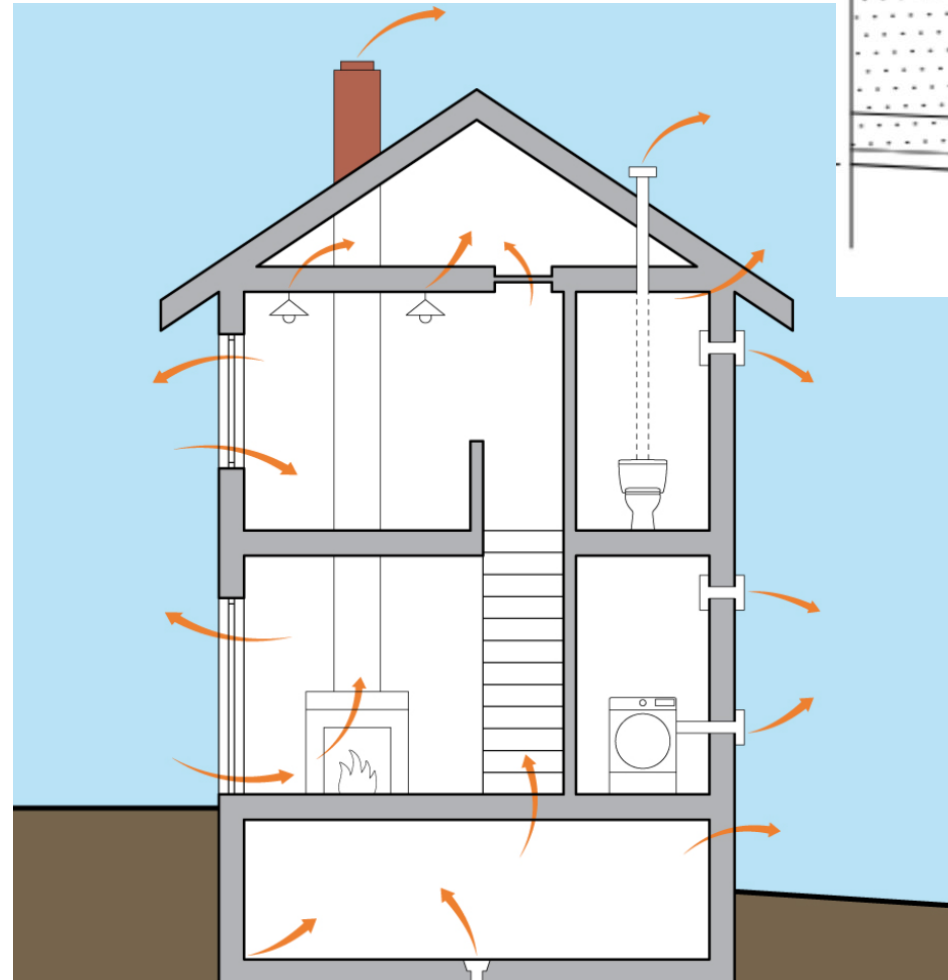
TO FURTHER REDUCE HOUSEHOLD EMISSIONS Electric car, lawnmower.... avoid plastics, food & lifestyle choices mindful of climate impacts **EVERY INDIVIDUAL ACTION MATTERS!**

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[DOE](#) [PassiveHsAccel](#)

Control the flow of
AIR - HEAT - MOISTURE



Continuous
unbroken line

A large fire is burning in a forest, with bright orange and yellow flames rising from a pile of logs. The background is filled with tall, thin trees, and the air is hazy with smoke. A semi-transparent dark grey horizontal band is overlaid across the middle of the image, containing white text.

SMOKE INFILTRATION MINIMAL
with tight enclosures



CARMEL HEIGHTS



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[DOE](#) [Insulation Institute](#)



- R Value – effectiveness
- Toxicity
- Fire resistance



Interior temperature difference with/without exterior insulation

1" Gutex
R5.7



126 degrees



101 degrees
Without



67 degrees
With exterior insulation



Airtight & super insulated inside & out





FIRE
POWER LOSS

Day 12
16/4F degrees
Hs maint. 66 deg

Wildfire smoke
No infiltration
CO Oct 2020

Heating, Cooling, Hot Water

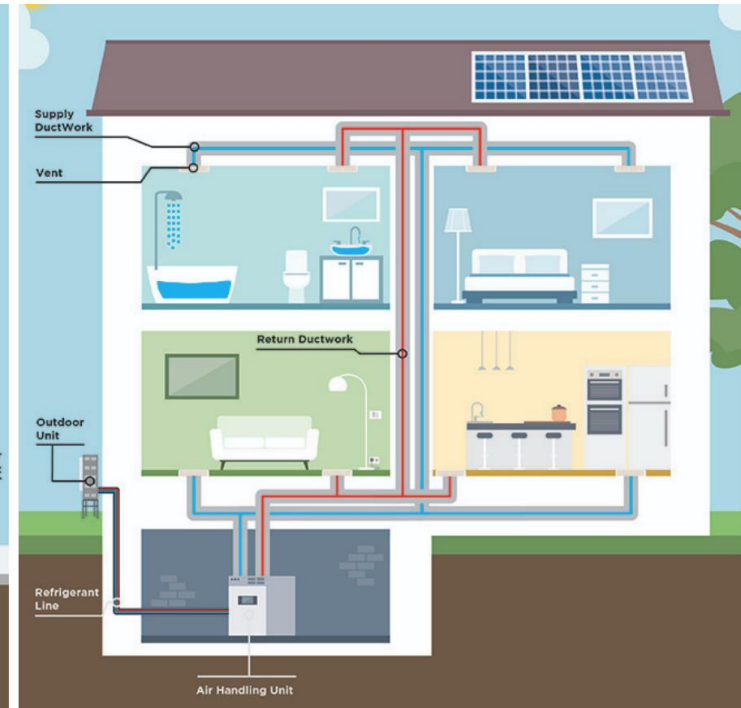
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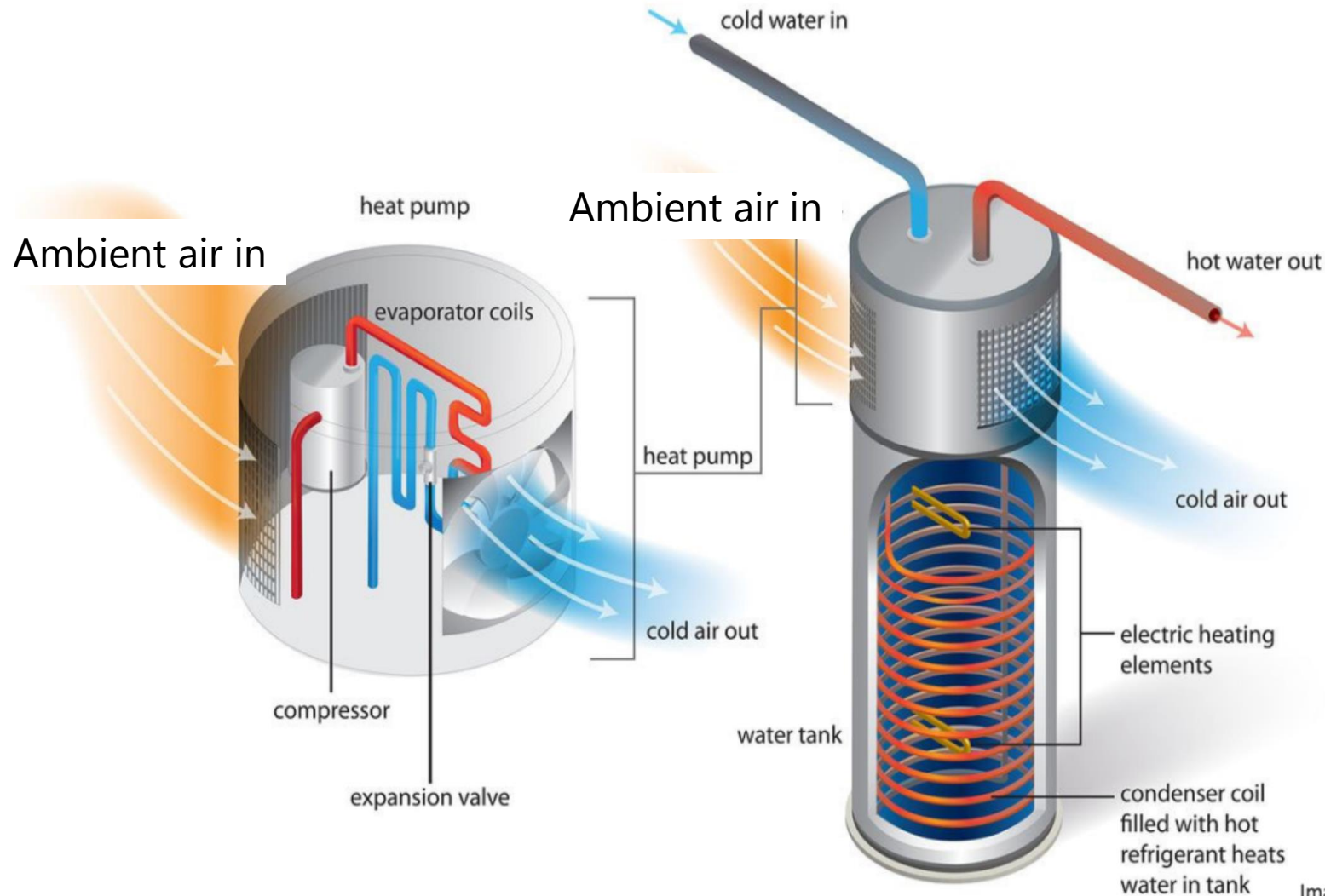
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HEAT PUMPS Mini Splits & Ducted



Heat Pumps Move Air



Like a reverse refrigerator

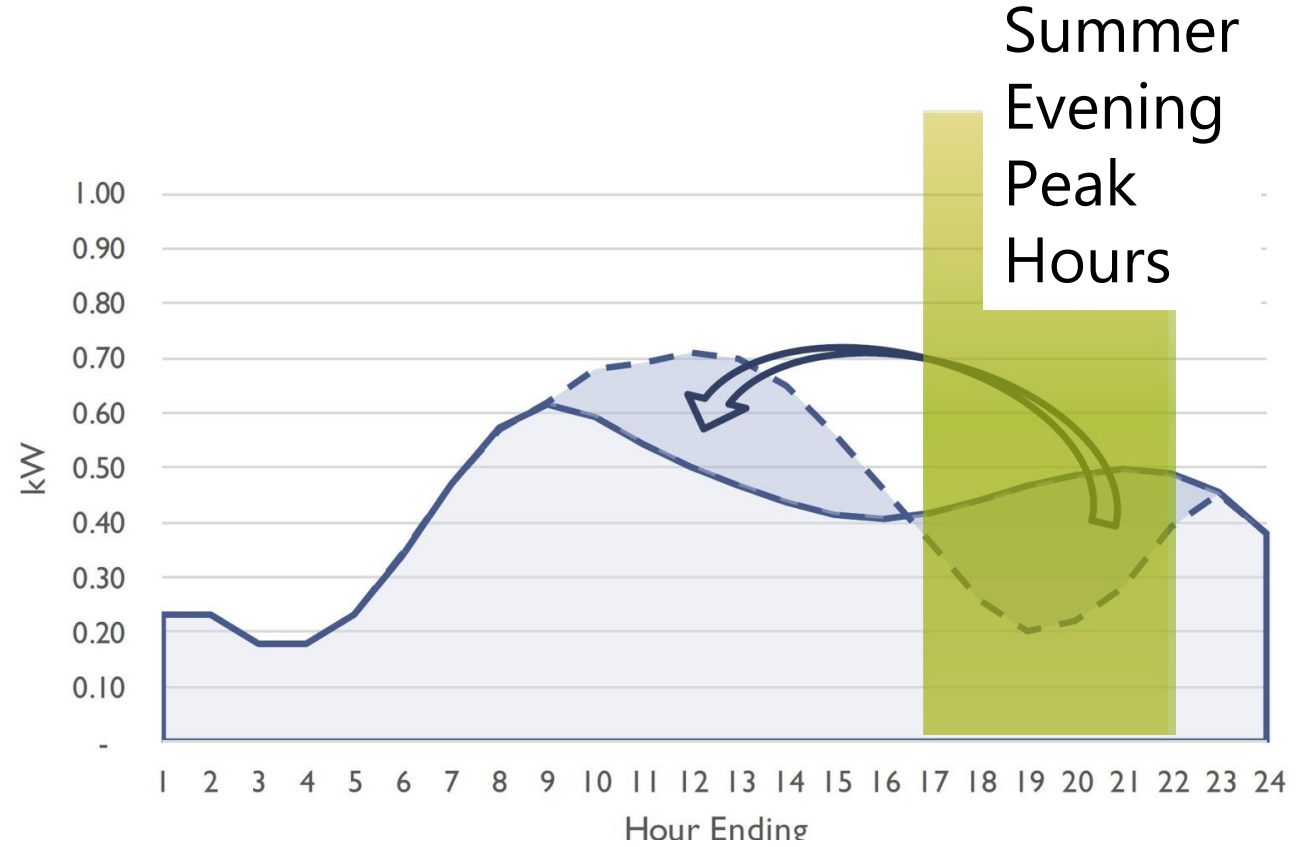
Refrigerants extract heat from ambient air then transfer it to heat the water in tank

3-5x more efficient than other furnaces

Image Source: [This Old House](#)

Storage: Flexible Load Shifting

Like a battery!



Hot Water Load Timing Potential

Wi-Fi Controls now Required

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For Pristine Air Quality

Control the source

- Air tightness
- Materials, no gas

Maintain with Fresh filtered air



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Induction stoves are safer, precise, efficient.

Effective exhaust is critical but many range fans are inadequate - have yours tested! Open windows when possible.



INDUCTION

- Safer
- Healthier air
- Precise
- Less energy 50-70%
- Cooler kitchen
- Cooks faster
- Easy to clean



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[Resources](#) for healthier [materials](#).



National Center for **HEALTHY HOUSING**

Building Products,
Materials, and Standards

Building Product Standards

Potential Chemicals Found in
Building Materials



Resources



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The image is a vertical split composition. The left half shows a forest at night with a large fire burning brightly in the background, casting a warm orange glow. The right half shows a winter scene with snow-covered trees and a blue-tinted sky. A semi-transparent grey box is overlaid across the middle of the image, containing the text.

RESILIENCE

The building will stand up to
extreme conditions



FEATURES

*no ember
catchers

Simple form

Metal roof

Stucco siding

1 hour wall

No vents

No eaves

Windows – double pane

Hardscaping – ret. wall

* Passive Hs principles



RESILIENCE

Safe shelter - longer

Resilience advances along with performance; homes maintain [safe temperatures](#) and clean air longer without power, providing safer shelter for humans.

Air & Water quality Temperatures Power loss

MARKET VALUE

In listings and appraisals

For accurate valuations
we need -

Communication

Visibility

Documentation

Pool of
Knowledge



Your HOME can be HEALTHY, RESILIENT, ECO-FRIENDLY

Science-based
GUIDE to home
improvements

PLANNING HOME IMPROVEMENTS?



From tiny to extensive projects, it's helpful to be informed by performance principles

This guide spotlights key steps in your path to enjoy these ...

BENEFITS

- Quality of life
- Health
- Energy savings
- Superior comfort, quality & durability
- Resilience in power losses, extreme events

Your guide to a clean energy home

Prioritize Efficiency!

1. Optimize existing home **structure** by improving efficiency
2. Switch gas **appliances** to electric
3. Power your home with **solar**

Control Air Movement

Most homes have random leaks. Air **seal** to limit the flow of air, moisture, heat, pollutants.

Windows

Replace single-paned to improve comfort, save energy

Increase Insulation

Most homes are under insulated (DOE). Adequate insulation supports comfort, durability, resilience, efficiency.



Summer

Reduce Heat Risks

Add shading strategies. Design awnings or eaves to block summer sun when it's at higher angles (lower winter sun can help heat home). Plant shade trees.



Winter

Improve Air Quality

Deliver fresh filtered air with an efficient system such as a heat recovery ventilator.

Solar + Batteries

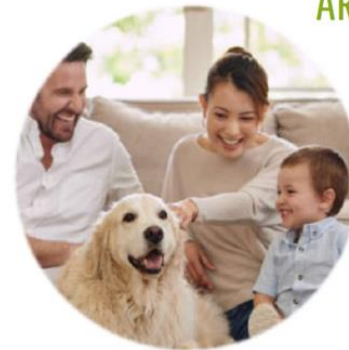
Reduce climate impacts and long-term expenses while increasing resilience.

Your HOME can be HEALTHY, RESILIENT, ECO-FRIENDLY

Science-based
GUIDE to home
improvements

CONCERNED ABOUT CLIMATE CHANGE?

ARE YOU ASKING *"What can I do?"*



Our climate actions can start with our homes!

Improve your home & enjoy these ...

BENEFITS

- Quality of life
- Lower climate impact
- Health
- Resilience in power losses, extreme events
- Superior comfort, quality & durability
- Energy savings

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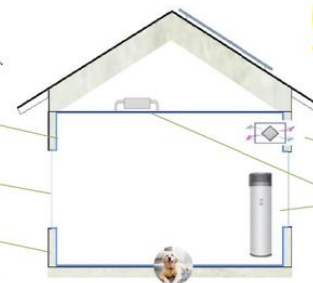
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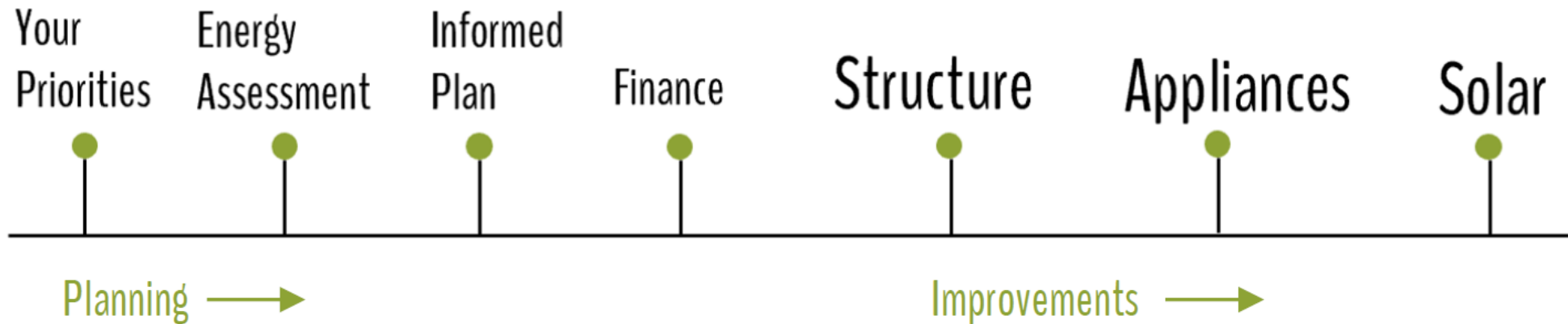
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improvements



THANKS TO



ALWAYS BE LEARNING!

debralittle1@gmail.com

Closing



Continuing Education Units Available (AIA)

- Contact info@3C-REN.org for any questions!

Upcoming Courses:

- **Clean Energy Homes Series for Appraiser & Real Estate Agents coming this Fall!**
 - Solar PV: Technology and Valuation **(10/13)**
 - Carbon Free Homes: Features, Benefits, Valuation **(10/20)**
 - High-Performance Homes: Valuation 2 **(10/26)**
 - Clean Energy Homes: Earn Stellar Referrals & Boost Profits **(10/27)**



Thank you!

More info: **3c-ren.org**

Questions: **nnewman@3c-ren.org**

Email updates: **3c-ren.org/newsletter**



TRI-COUNTY REGIONAL ENERGY NETWORK
SAN LUIS OBISPO • SANTA BARBARA • VENTURA

