Governor's Office of Energy

NEVADA CLIMATE STRATEGY & ENERGY CODES

How energy codes play a pivotal role in reaching the goals of the Climate Strategy

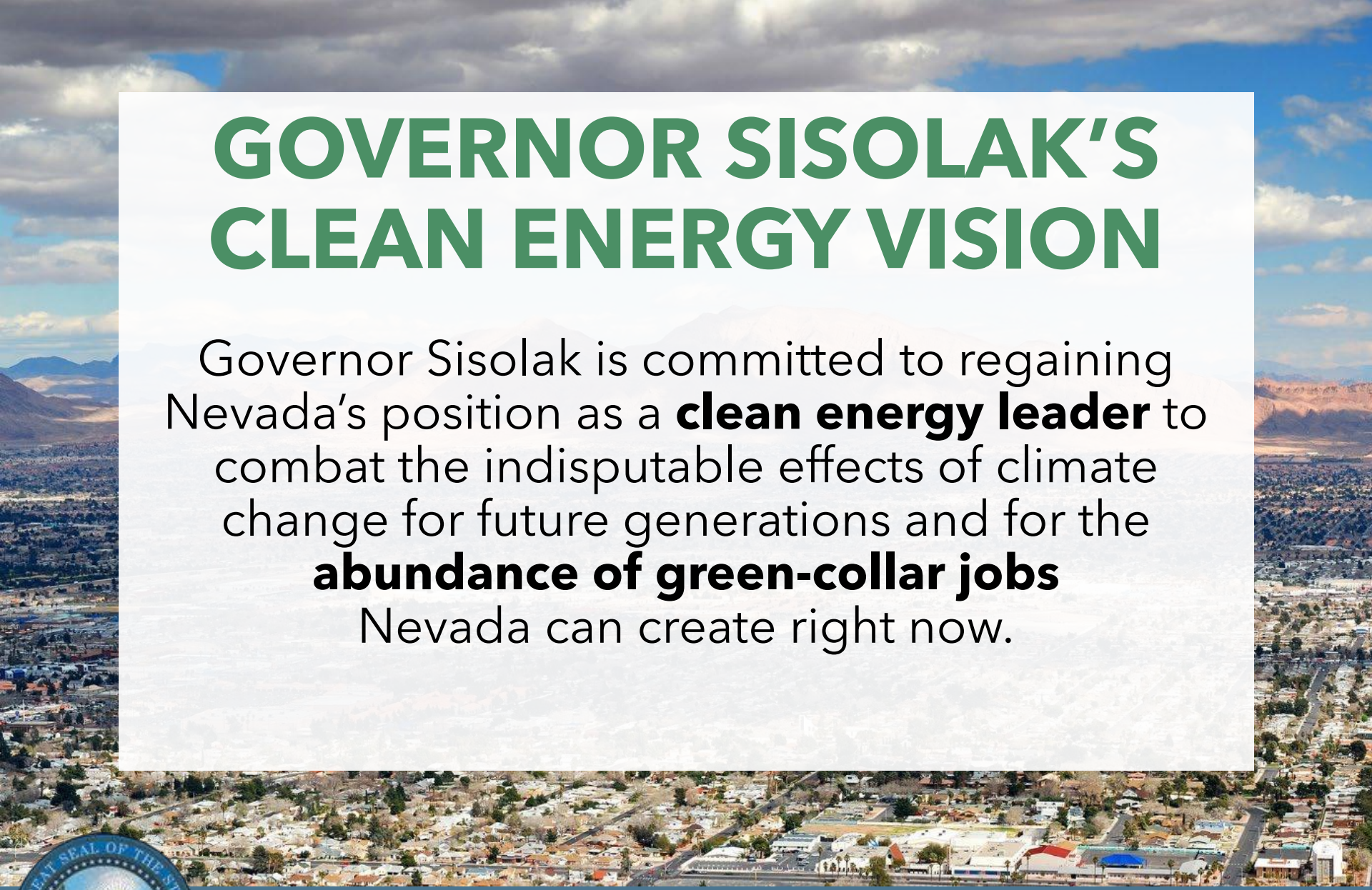
March 17, 2021

Robin Yochum, Energy Program Manager

AGENCY OVERVIEW

Mission

- to ensure the wise development of Nevada's energy resources in harmony with local economic needs and to position Nevada to lead the nation in:
  - renewable energy production
  - energy conservation
  - export of energy
  - transportation electrification



GOVERNOR SISOLAK'S CLEAN ENERGY VISION

Governor Sisolak is committed to regaining Nevada's position as a **clean energy leader** to combat the indisputable effects of climate change for future generations and for the **abundance of green-collar jobs** Nevada can create right now.

Governor's Office of Energy

CLIMATE INITIATIVE

In 2019, Nevada took decisive action to address the climate crisis:

- joining the U.S. Climate Alliance
- passing SB 254 (2019)
- Governor Sisolak's Executive Order 2019-22 directing state agencies to develop a Climate Strategy
  - released December 1, 2020: **climateaction.nv.gov**

CLIMATE GOALS & IECC

- According to the Nevada Climate Strategy, energy codes are instrumental in achieving Nevada's climate goals
- Energy codes are projected to save U.S. homes and businesses $126 billion between 2012 and 2040
- 2021 IECC will be 10% more energy efficient than 2018

GREENHOUSE GAS IMPLICATIONS

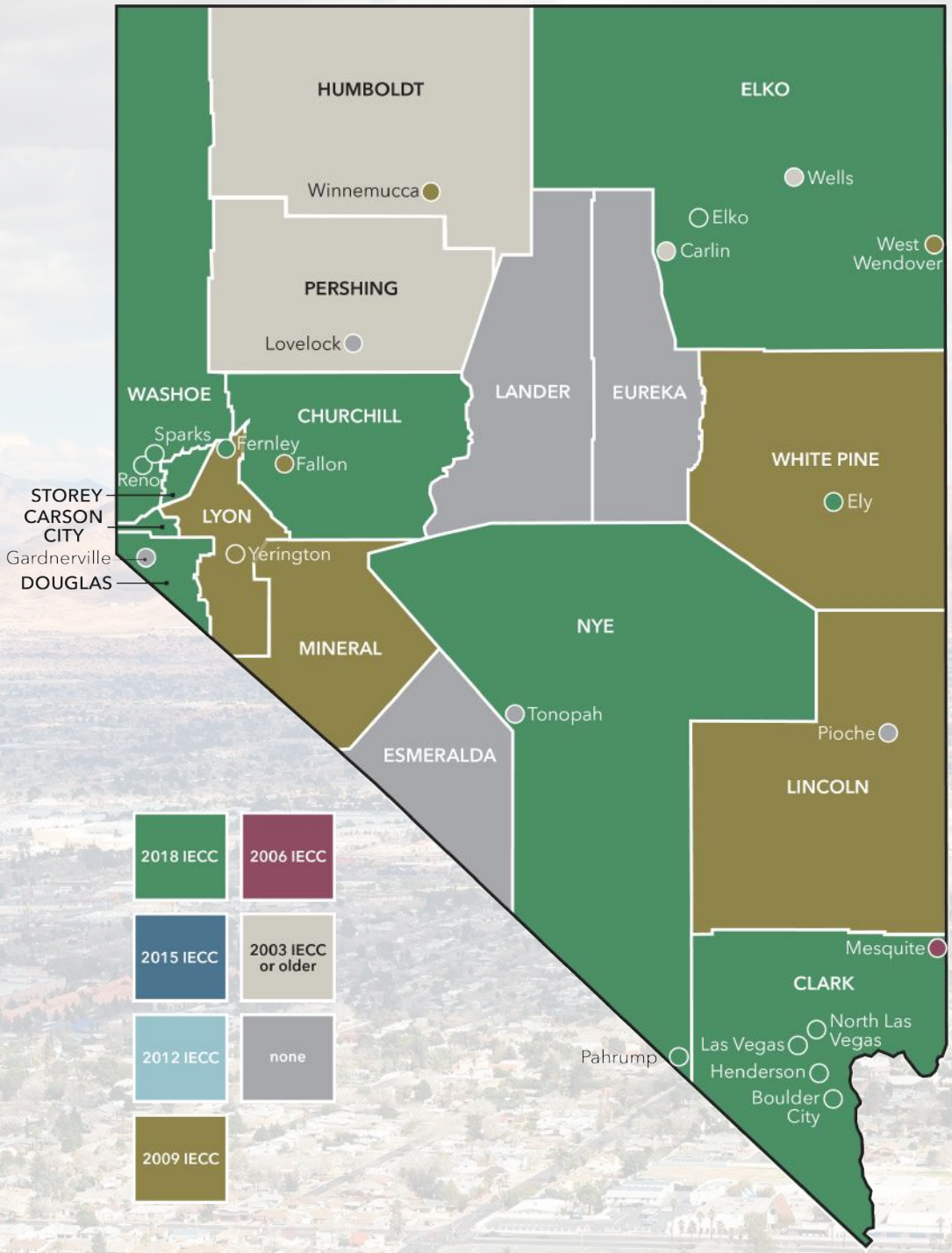
State	SO2 (lbs)	NOx (lbs)	CO2 (tons)	PM 2.5 (lbs)
Idaho	-277	-24,299	-35,136	-4,097
Montana	-105,132	-187,160	-86,769	-17,065
Nevada	-102,412	-107,840	-137,570	-18,582
Oregon	-150,537	-117,902	-102,872	-19,507
Utah	-105,865	-295,200	-157,507	-15,455
Washington	-52,544	-192,908	-169,709	-9,808
Wyoming	-176,063	-209,222	-118,515	-7,118

IECC ADOPTION BENEFITS

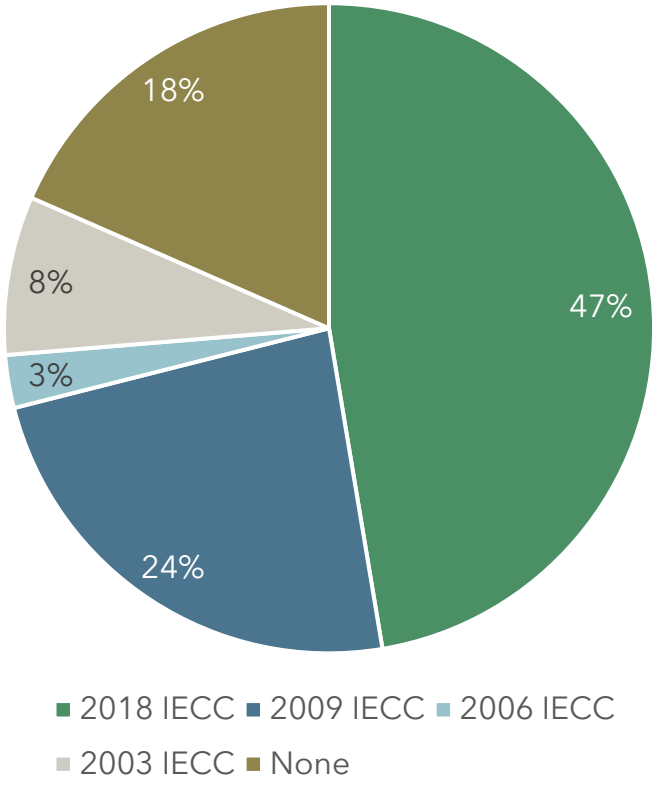
- Lower energy bills for all Nevadans, including those in low- to moderate-income communities
- Healthier indoor environments
- Energy efficient homes and businesses for decades
- Assists in meeting state climate goals

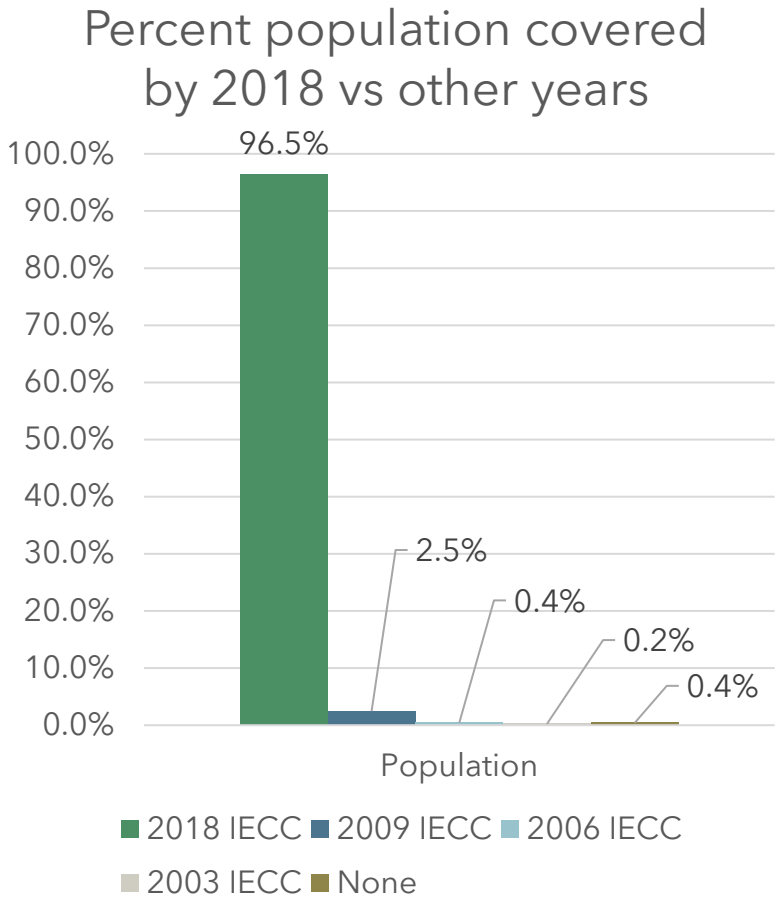
ENERGY CODES

- Pursuant to NRS 701, GOE must adopt the most recently published version of the International Energy Conservation Code (IECC)
- 2018 IECC was adopted in July 2018
- Many local jurisdictions followed suit:
  - By July 2020, 47% of the adopted energy code in the state was the 2018 IECC
  - Encompassing 96.5% of the state's population


HUMBOLDT
Winnemucca
ELKO
Wells
Elko
Carlin
West Wendover
PERSHING
Lovelock
WASHOE
Sparks
Reno
Fernley
CHURCHILL
Fallon
LANDER
EUREKA
WHITE PINE
Ely
STOREY
CARSON CITY
LYON
Yerington
Gardnerville
DOUGLAS
MINERAL
NYE
Tonopah
ESMERALDA
Pioche
LINCOLN
Mesquite
CLARK
North Las Vegas
Las Vegas
Henderson
Boulder City
Pahrump
2018 IECC
2006 IECC
2015 IECC
2003 IECC or older
2012 IECC
none
2009 IECC

NEVADA ADOPTION OF IECC





Governor's Office of Energy

LOCAL ADOPTION

The Climate Strategy recognizes local jurisdictions are impacted more heavily than the state.

Local impacts include

- Adoption of the full family of I-codes, not just IECC (International Residential Code - IRC, International Building Code - IBC)
- Training must occur prior to adoption
- Implementation and enforcement
- Funding required – varies by jurisdiction
- Significant staff time required

FUTURE FOR IECC IN NEVADA

- Adoption of the 2021 IECC
- Appendices that positively impact Nevadan's
- Training sessions on significant changes 2018-2021
- Coordination at state level to support increased adoption throughout the state

SMART ENERGY DESIGN ASSISTANCE CENTER (SEDAC)

- Pilot program to develop resources for energy efficiency and energy codes for the next generation of professionals
- Funded through the U.S. Department of Energy
- Participation needed from:
  - Community colleges (instructors and administrators)
  - Code officials
  - Trade programs
  - Energy efficiency industry
  - Design and construction professionals
  - Anyone interested in energy efficiency and energy code workforce development

CONTACT

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Governor's Office of Energy

Nevada Energy Code Collaborative – Q1 Meeting

Paul Karrer

Sr. Manager, Building Code Policy

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Michael Winn, AIA

Sr. Manager, State and Local Policy

michaelwinn@aia.org

Recent AIA Initiatives

- **Climate Action Plan**
- **Architect's Policy Platform 2020**
- **Blueprint for Better**

Climate Action Plan

Goals

- **Mitigating the sources**
- **Adapting to the impacts**
- **Catalyzing architects to act**

Mitigating the sources

Establish the relevance and importance of the building sector and architectural practice in climate mitigation solutions.

- Shape policies and regulations to require and incentivize significant reductions in operational and embodied carbon.

- Activate communities to achieve decarbonization goals

Adapting to the impacts

Design buildings and communities to anticipate and adapt to the evolving challenge of climate changes.

- Develop resources and research to support the architects' role in reducing climate risk, consequence, and vulnerability, and demonstrate how every project and client can contribute to climate action.

- Develop and champion policy recommendations that promote climate-sensitive design and adaptation for all new and existing buildings and communities.

Catalyzing architects to act

Lead meaningful change and contribute to climate solutions in partnership with our global community.

- Develop and implement a plan to engage and empower all AIA members to transform architectural practice for climate action.
- Develop and communicate a comprehensive climate action advocacy agenda.
- Partner and align efforts with global climate action allies to accelerate our outcomes.

Architect’s Policy Platform

Architect's Policy Platform

- Developed and approved by Board of Directors, with input from Knowledge Communities, Components, leadership
- Responds to four simultaneous crises
  - Climate
  - Racial Equity, Economy, Public Health

Climate Action

- Exercise American leadership
- Transform energy use
- Commit to zero-carbon practices

Transform Energy Use

- Promote renewable energy & embrace building electrification
- Promote renewable energy through state incentives
- Advocate for the elimination of fossil fuels from buildings
- Create incentives for the adoption of net zero carbon building codes
- Support the ZERO code as a national building energy standard and create federal financial incentives for adoption

A Future Economy

- Prioritize job creation
- Leverage private investment
- Adopt business friendly tax policies

Leverage private investment

- Utilize tax incentives to spark resilient, sustainable, & equitable development
- 179D, the Energy Efficient Commercial Buildings Deduction, increase deduction to $3 per sf
- 25C, the Non-Business Energy Property Tax Credit: Double the credit to $2,400 and the eligible expenditures to 30%
- 45L, the New Energy Efficient Home Credit, increase the credit to $2,500

Healthy and Equitable Communities

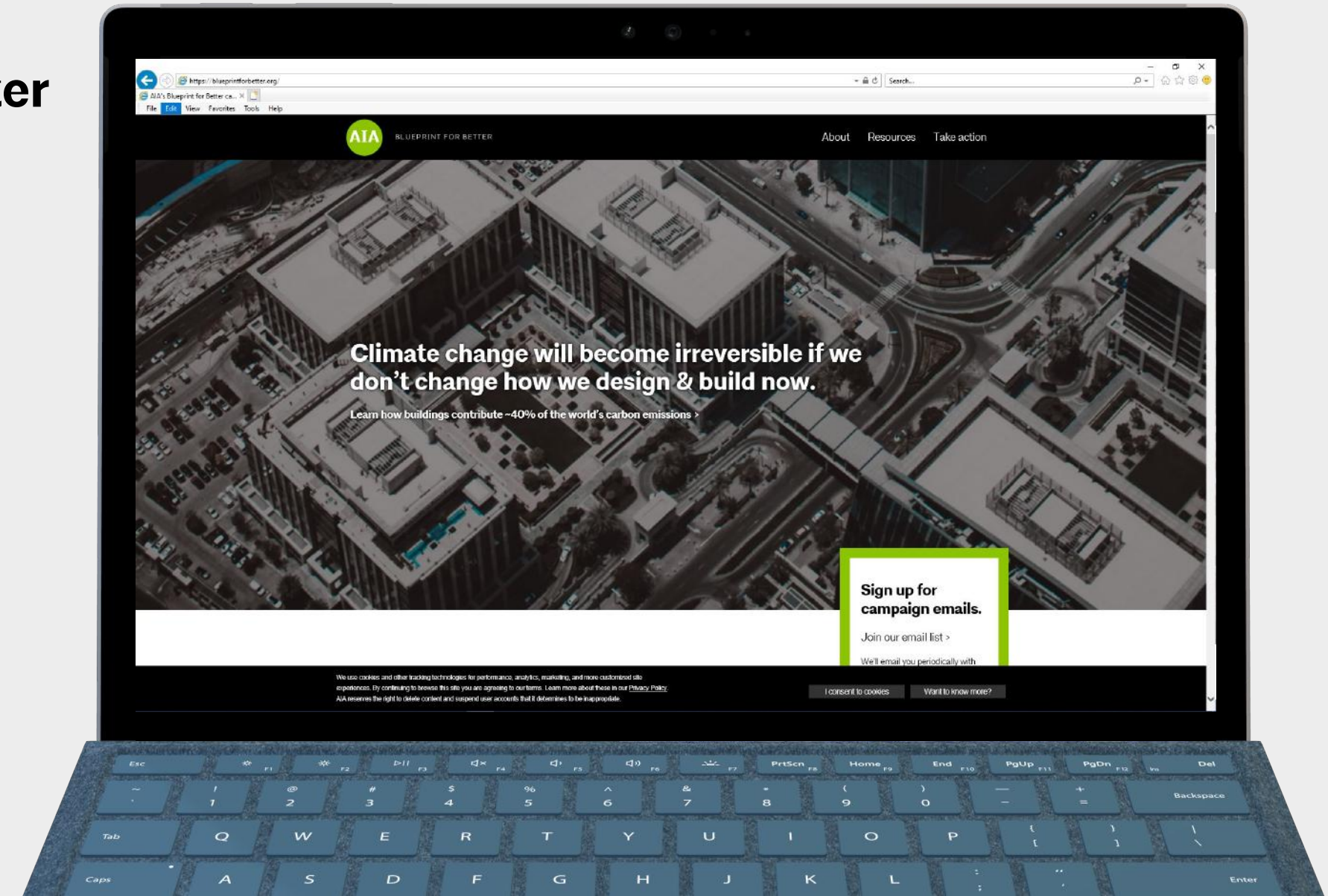
- Invest in housing & infrastructure
- Reinvest in America's public places

Reinvest in America's public places

- Improve building resilience & adaptation to allow populations to shelter-in-place
- Tax incentives to improve the resilience of buildings
- Fund flood & risk mapping & prioritize resilient land use policies
- Strengthen water & air quality policy

Blueprint for Better

Blueprint for Better Public Campaign



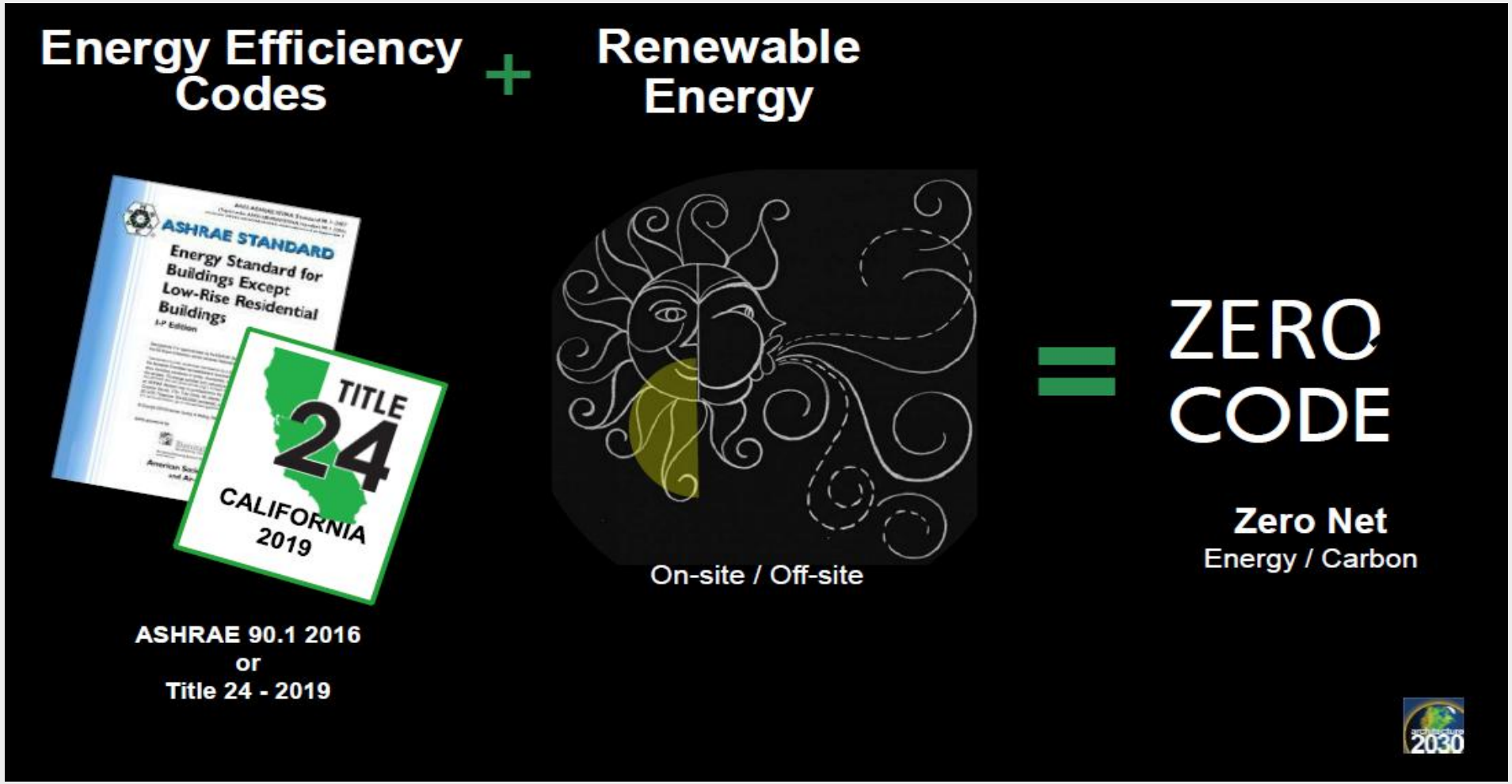
Tools to help State and local communities meet their climate goals

- ZERO Code
- 2021 IECC Voluntary Appendices
- Advanced Energy Design Guides (Achieving Zero Energy)
- What's next?

ZERO CODE™

ZERO Code by Architecture 2030

- The ZERO Code (ref. ASHRAE 90.1-2016)
- ZERO Code 2.0 (ref. ASHRAE 90.1-2019)
- 2019 ZERO Code for California
- 2022 ZERO Code for California


Energy Efficiency Codes
+
Renewable Energy
ASHRAE STANDARD
Energy Standard for Buildings Except Low-Rise Residential Buildings
TITLE 24
CALIFORNIA 2019
ASHRAE 90.1 2016
or
Title 24 - 2019
On-site / Off-site
=
ZERO CODE
Zero Net
Energy / Carbon
2030

ZERO CODE™

Commercial • Institutional • Mid-Rise/High-Rise Residential Buildings

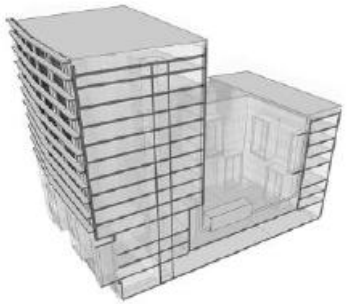
1 Design an energy efficient building

Efficiency Standard: ASHRAE 90.1-2016 minimum; ASHRAE 189.1-2017; others

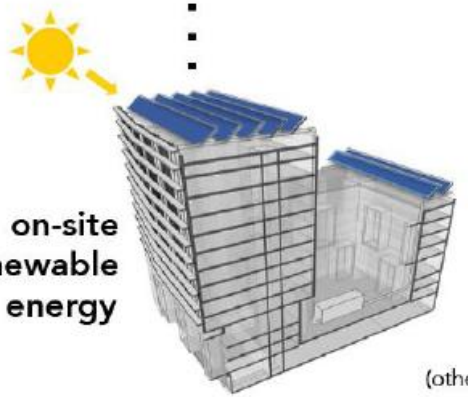
Efficient building envelope / daylighting

Passive heating / cooling / ventilation

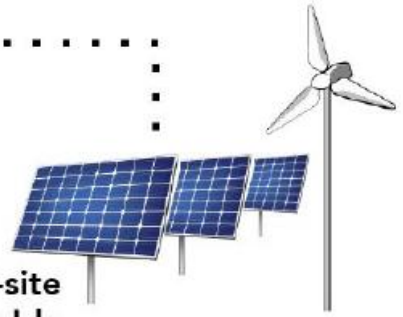
Efficient systems / equipment / controls



2 Address the remaining building's energy needs with:



on-site renewable energy

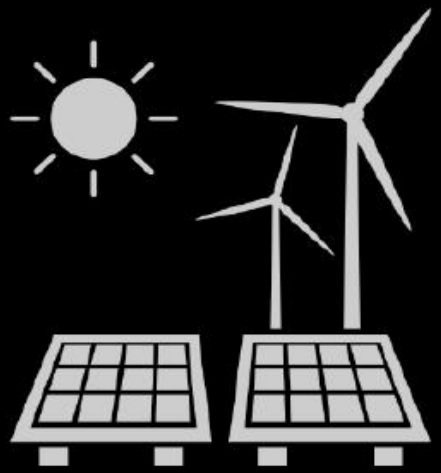


and/or off-site renewable energy

wind • solar • hydro
(other non-CO_2 emitting sources)

Source: Architecture 2030
Graphic adaptations: Sefaira; DOE

ZERO Code

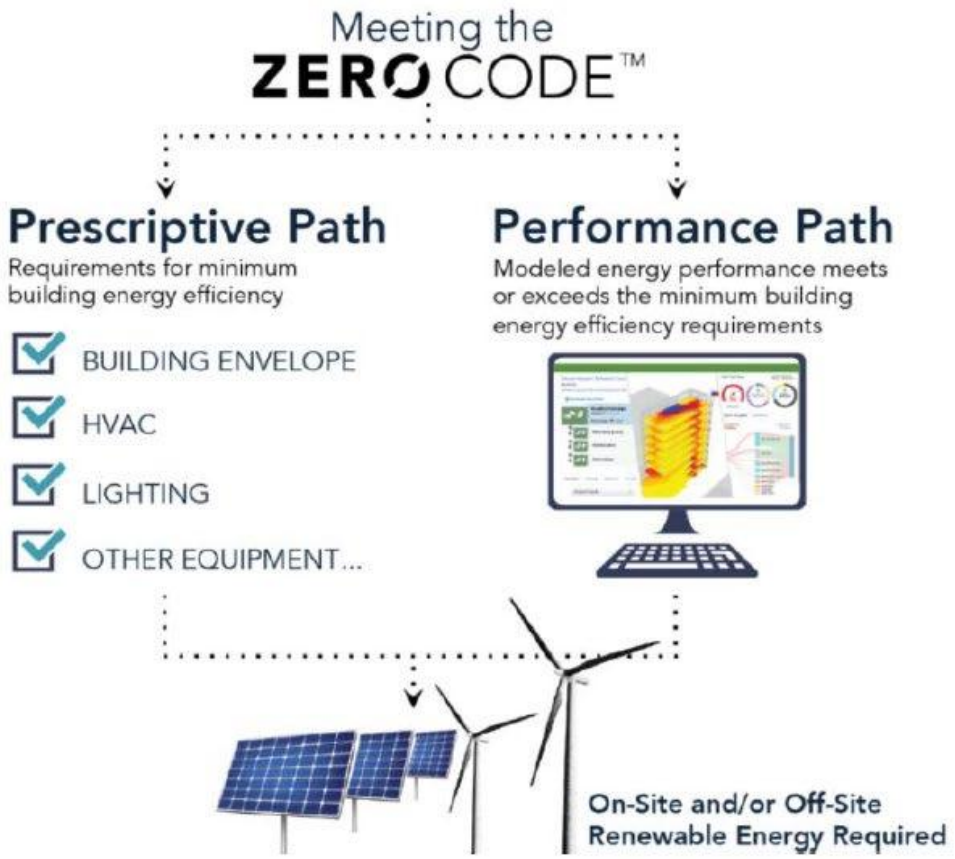


A Technical Support Document: Off-site Procurement of Renewable Energy

- Potential Off-Site Procurement Methods
- Comparison and Classification Methods
  - Set of criteria
  - Process for criteria weighting / prioritization

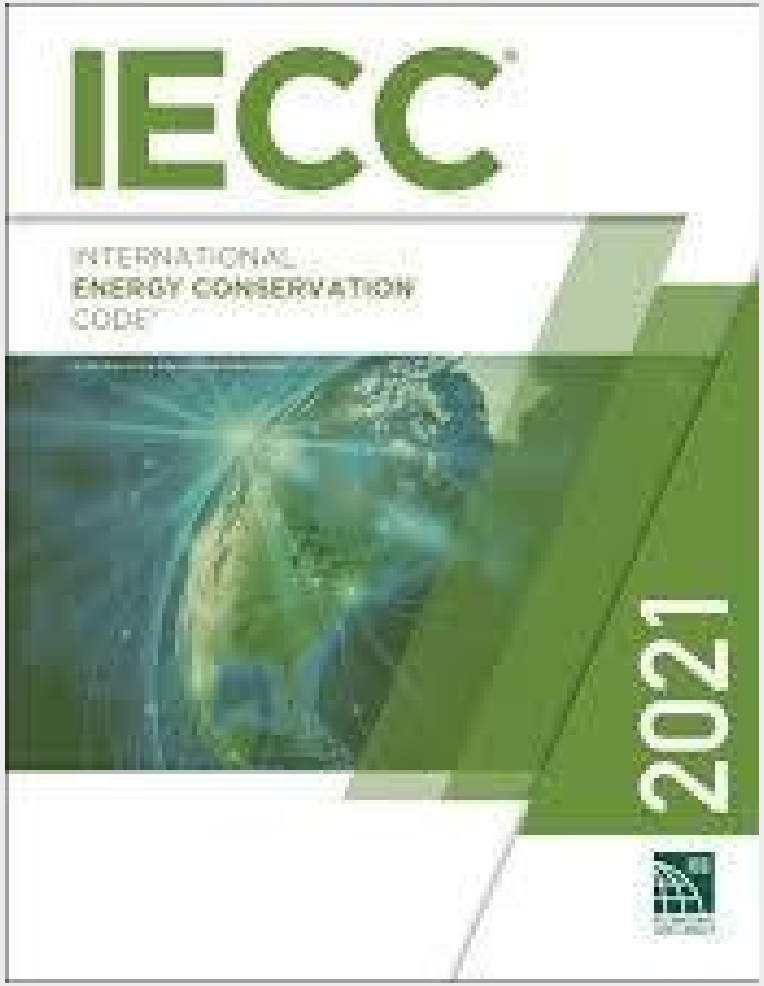
Outcomes

- Differential weighting assigned to different off-site renewable energy sources.
- Flexible approach with each jurisdiction that adopts the ZERO Code.


Meeting the
ZERO CODE™
Prescriptive Path
Requirements for minimum building energy efficiency
BUILDING ENVELOPE
HVAC
LIGHTING
OTHER EQUIPMENT...
Performance Path
Modeled energy performance meets or exceeds the minimum building energy efficiency requirements
On-Site and/or Off-Site Renewable Energy Required

2021 International Energy Conservation Code

- ~ 10% energy efficiency improvement over 2018 IECC
- Carbon reduction
- Residential and commercial zero energy appendices (voluntary for local jurisdictions)



2021 IECC Zero Energy Appendices

- Appendix CC – Zero Energy Commercial Building Provisions

  ("Zero Code Renewable Energy Appendix" sponsored by AIA and Architecture 2030)

- Appendix RC – Zero Energy Residential Building Provisions

  ("Residential Zero Energy Appendix" sponsored by New Buildings Institute)

Advanced Energy Design Guides (AEDGs)

Previously:

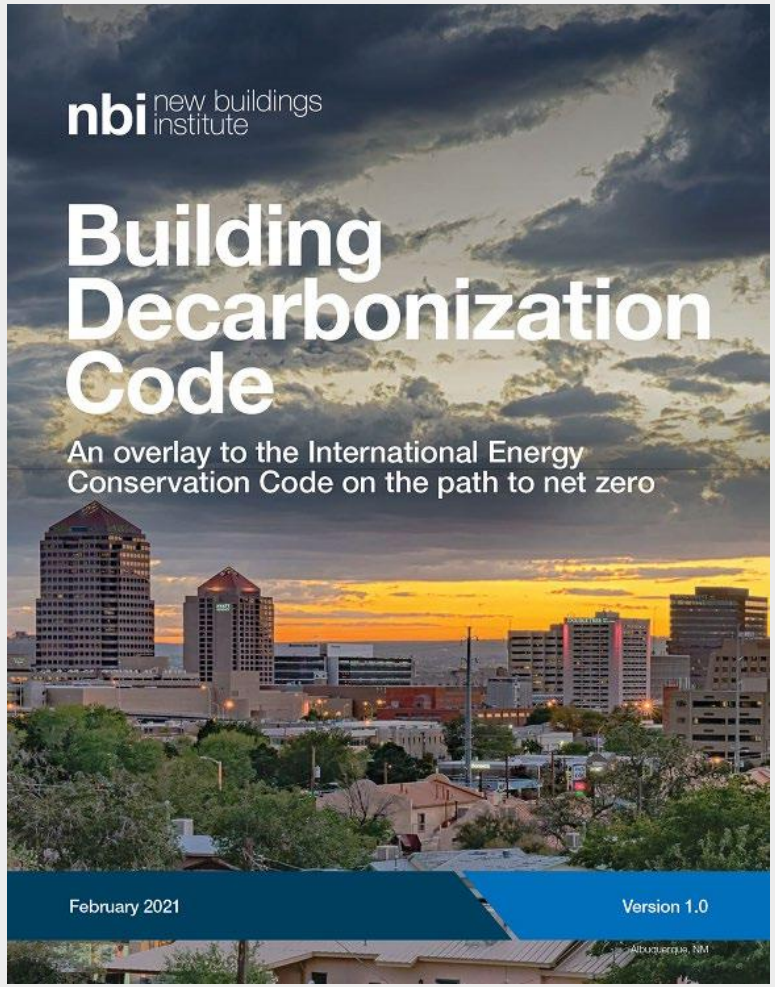
- AEDG 30% Guide series
- AEDG 50% Guide series

Achieving Zero Energy

- K-12 School Buildings
- Small to Medium Office Buildings
- Multifamily Buildings *(coming 2021)*

What's Next?

- Building electrification
- Building decarbonization
  - ➢ NBI Building Decarbonization Code
- Zero Carbon Design Guide series
- Addressing embodied carbon
- Addressing existing building adaptive reuse



AIA is here to help!

Climate action is an imperative across AIA

- Campaign assistance, technical guidance, or friendly discussion
- Connect allies to AIA Nevada and local AIA components

Thank you.

Residential Labeling Programs and Practices

David Heslam *Executive Director*
Earth Advantage - Portland, Oregon

What are home energy labels?

Home energy labels:

- Estimate a home's energy consumption and cost
- Ideally provide recommendations on cost-effective improvements
- Inform consumers when purchasing or renting a home
- Provide standardized and comparable information to the real estate market

Home energy labeling policies:

- Create a legal framework (e.g. ordinance, statute, or regulation) that dictates the use, creation, and/or deployment of home energy labels

High-level benefits of an energy labeling policy

Micro: Informing consumers about home energy performance, expected energy costs, and cost-effective improvements

Macro: Providing a mechanism for markets to value both home energy performance and home energy improvements

Why are cities supporting energy labeling policies?

Climate Action: lays a critical foundation to drive consumer action and increases consumer literacy around this issue

12-37% conversion rate for home energy improvements recorded

Consumer Protection: informs major purchasing decisions / ongoing homeownership costs and thereby reduces risk for consumers

Economic Development: job creation, better functioning real estate marketplace, local reinvestment of energy savings, higher quality residential building stock

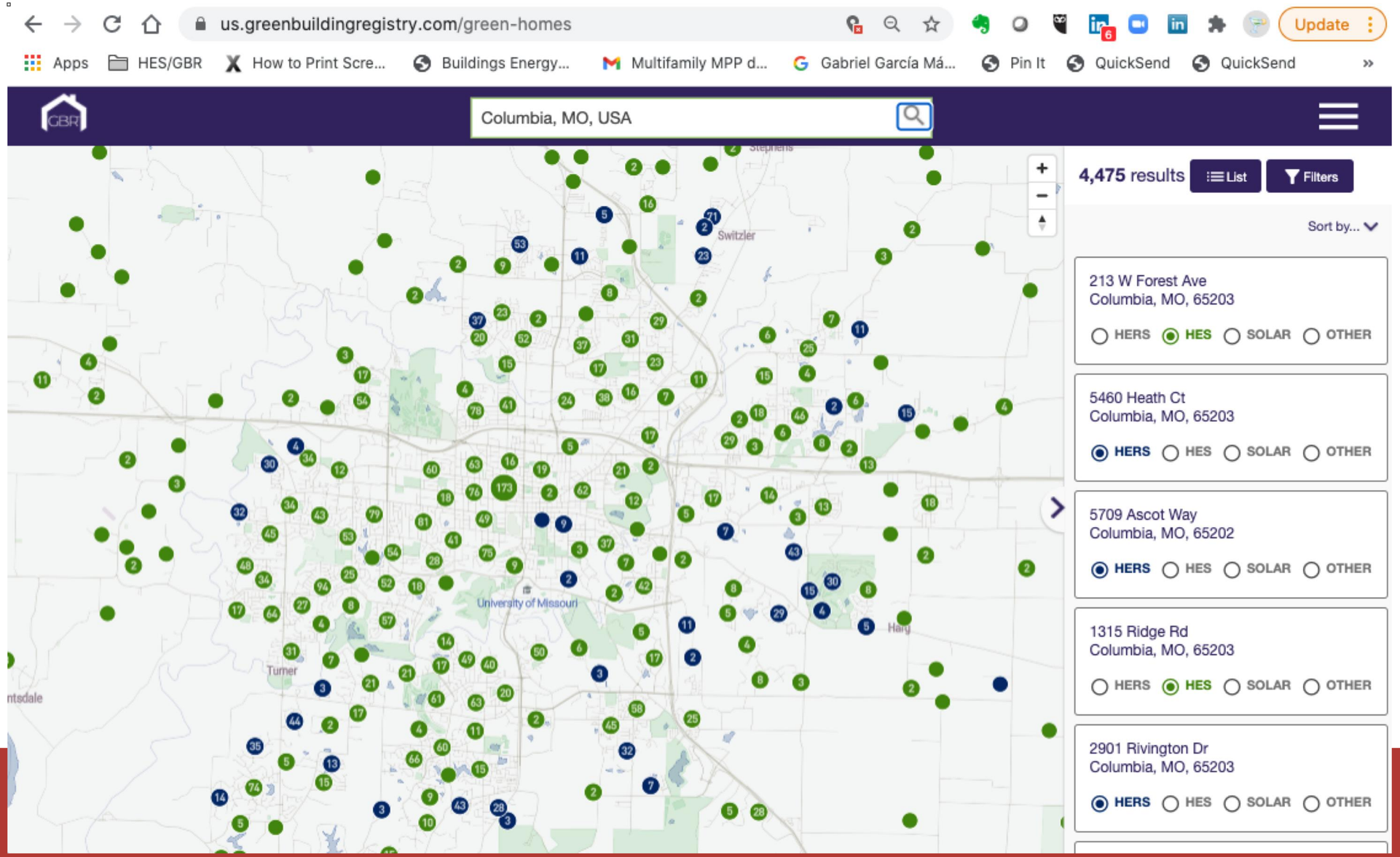
Community Development: clarifies and addresses energy burden risk (especially for LMI households), insights from open data can drive innovation and inform future policies

HES and HERS:
Can’t we work together?

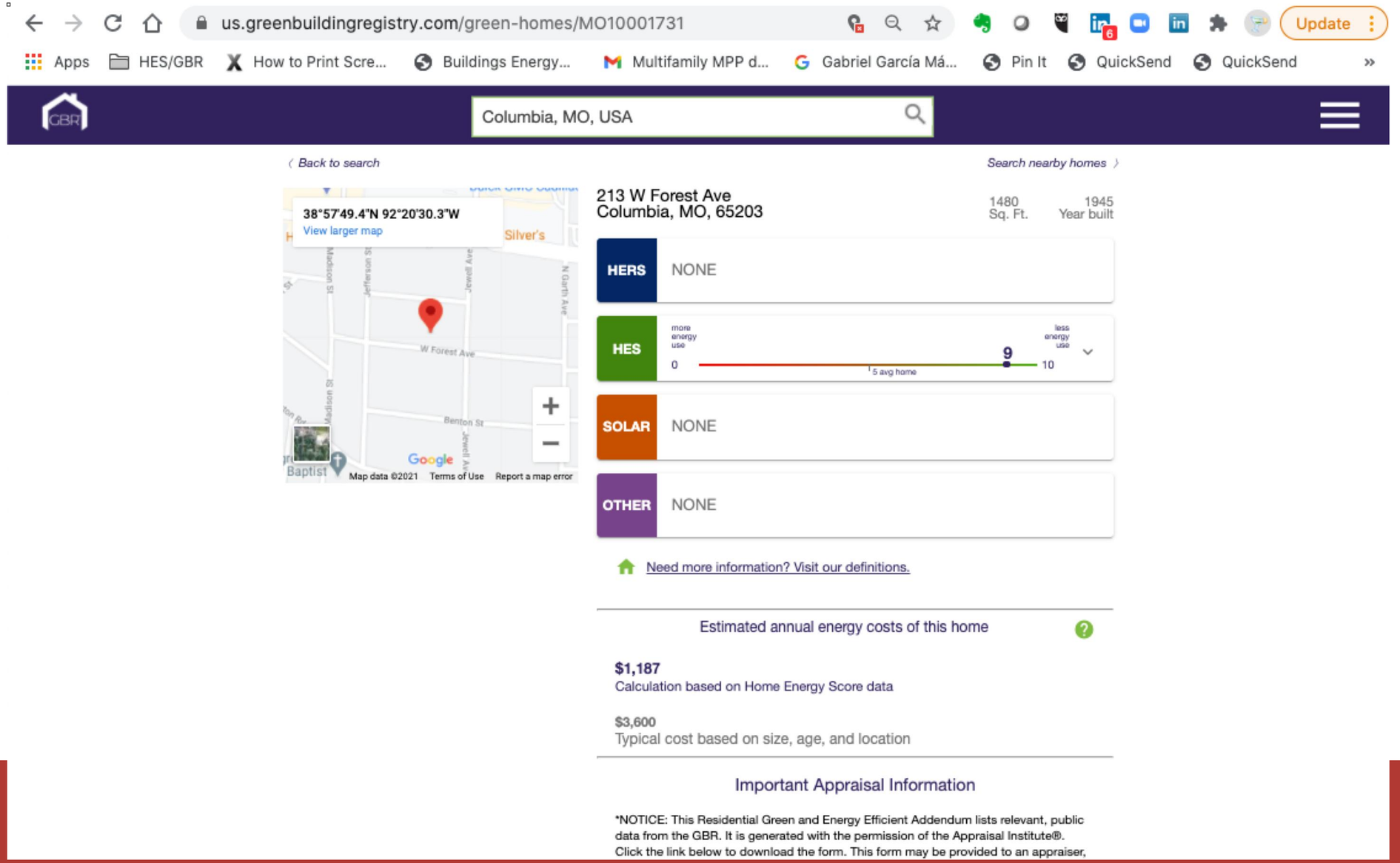
- The Home Energy Score was developed to rate existing homes and make improvement recommendations in a standard, consistent way.
- How can the information from the Home Energy Score be used in the market in a way that is complementary to the use of HERS ratings?

The Missouri way

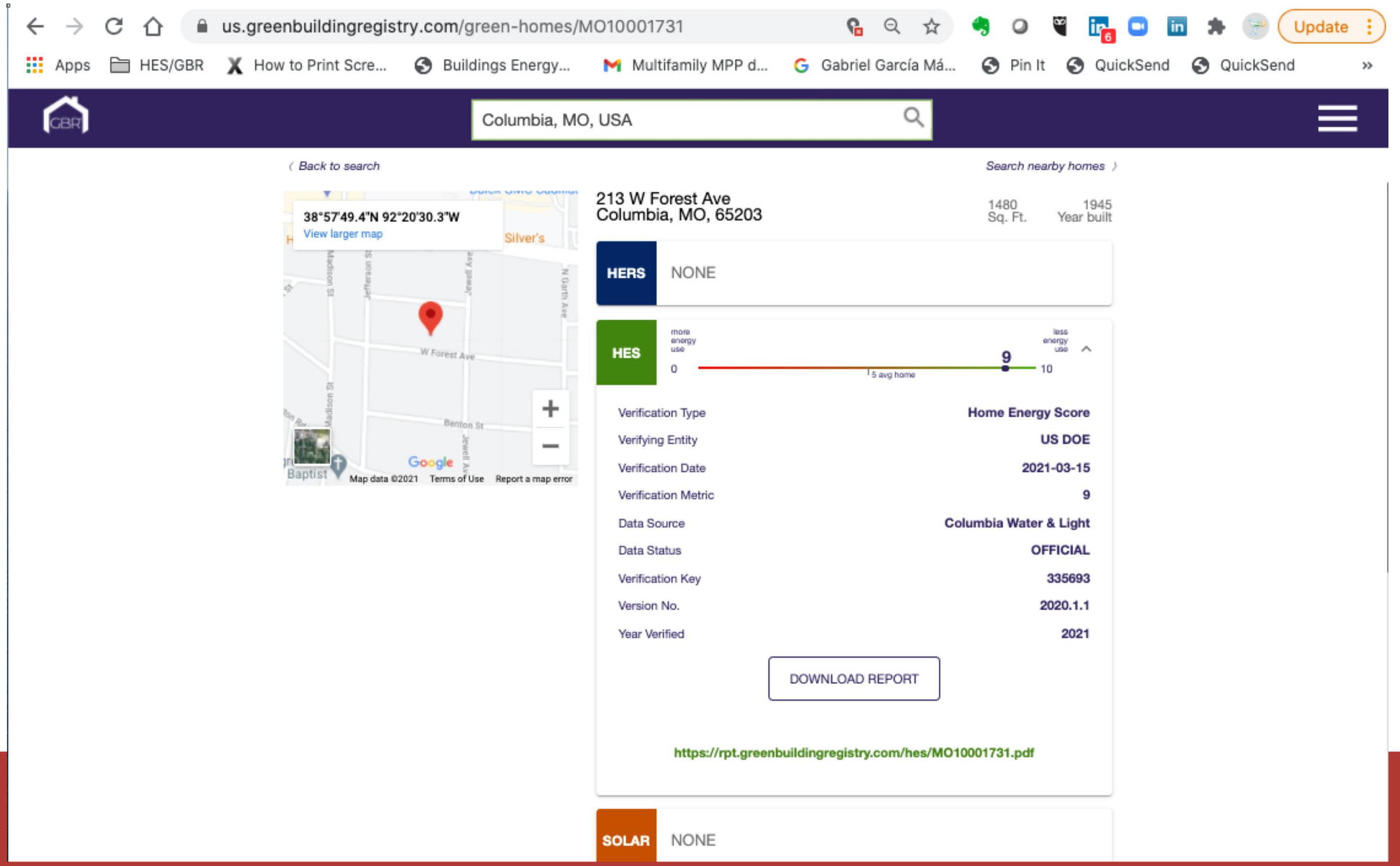
Missouri Home Energy Certificates



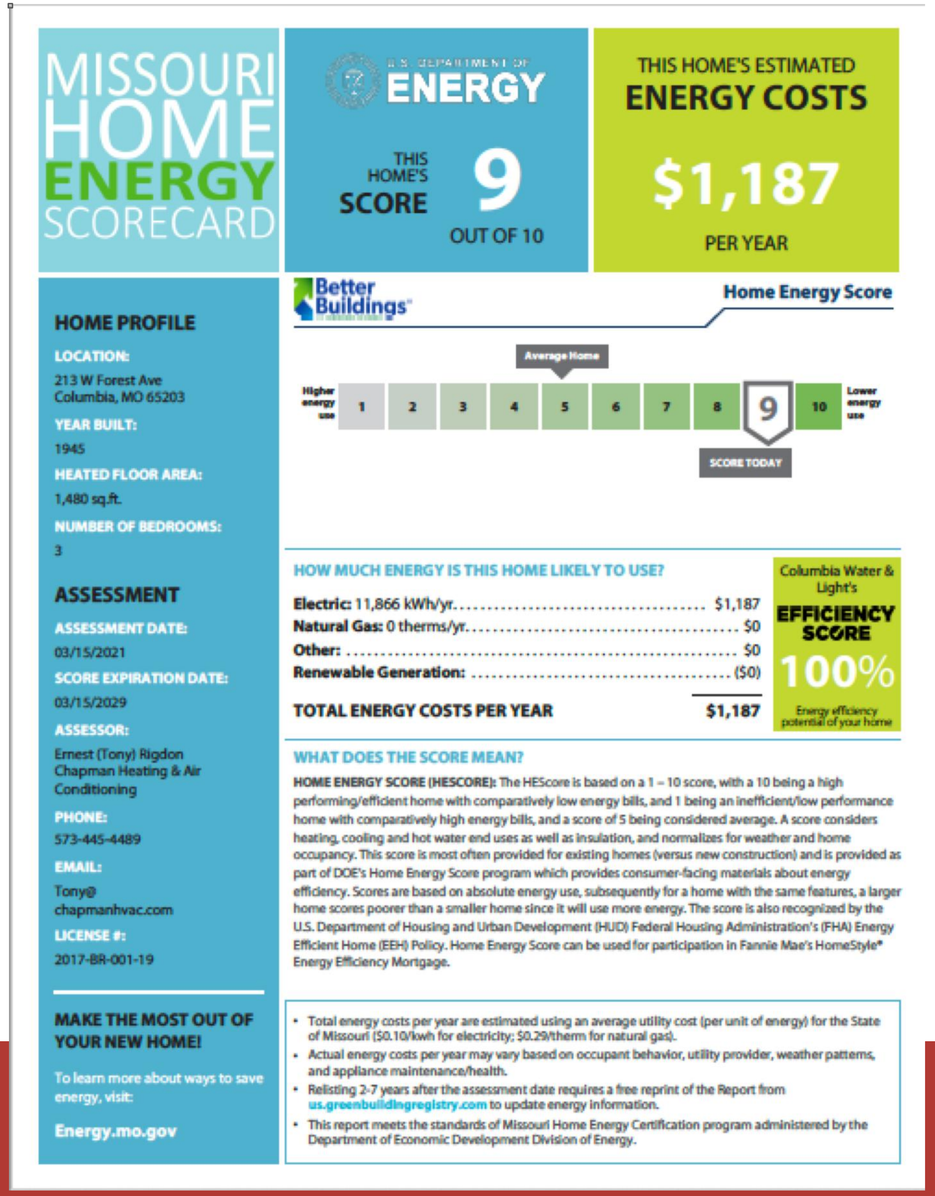
Home with HES=9



RESO Standard Fields for MLS Listings



Standard Reports for Sharing



MISSOURI HOME ENERGY SCORECARD

U.S. DEPARTMENT OF ENERGY

THIS HOME'S SCORE 9 OUT OF 10

THIS HOME'S ESTIMATED ENERGY COSTS $1,187 PER YEAR

HOME PROFILE

LOCATION:
213 W Forest Ave
Columbia, MO 65203

YEAR BUILT:
1945

HEATED FLOOR AREA:
1,480 sq.ft.

NUMBER OF BEDROOMS:
3

ASSESSMENT

ASSESSMENT DATE:
03/15/2021

SCORE EXPIRATION DATE:
03/15/2029

ASSESSOR:
Ernest (Tony) Rigdon
Chapman Heating & Air Conditioning

PHONE:
573-445-4489

EMAIL:
Tony@chapmanhvac.com

LICENSE #:
2017-BR-001-19

MAKE THE MOST OUT OF YOUR NEW HOME!

To learn more about ways to save energy, visit:

Energy.mo.gov

Better Buildings

Home Energy Score

Average Home

Higher energy use | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Lower energy use

SCORE TODAY

HOW MUCH ENERGY IS THIS HOME LIKELY TO USE?

Electric: 11,866 kWh/yr.	$1,187
Natural Gas: 0 therms/yr.	$0
Other:	$0
Renewable Generation:	($0)
TOTAL ENERGY COSTS PER YEAR	**$1,187**

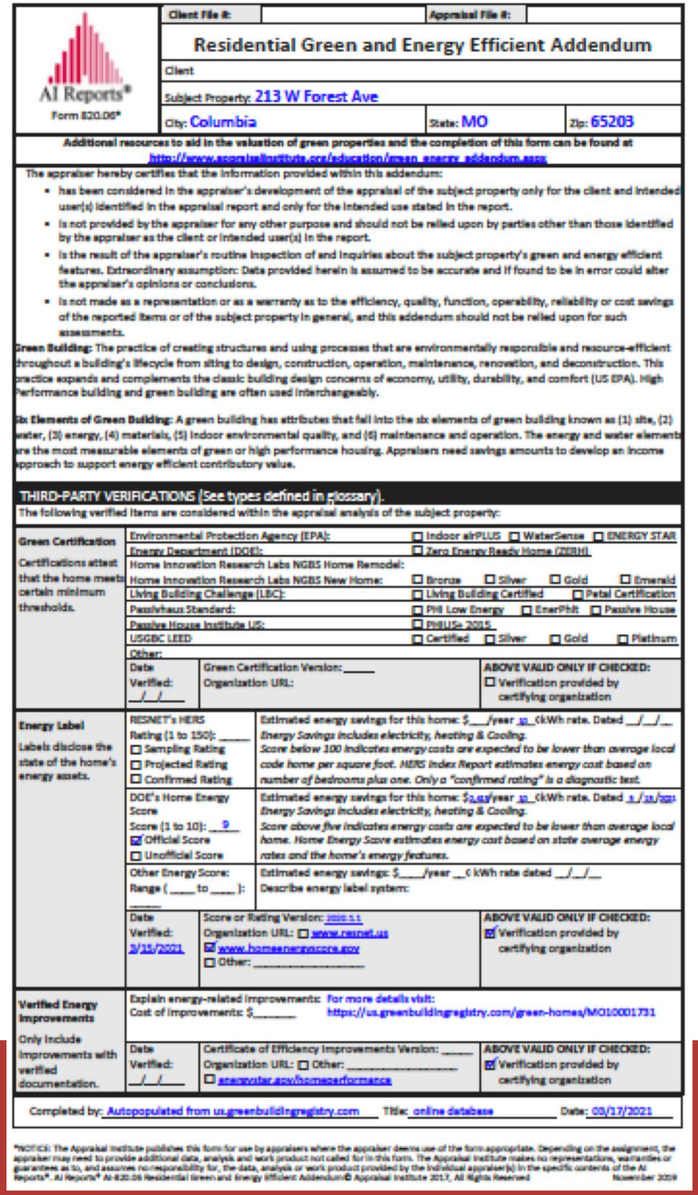
Columbia Water & Light's **EFFICIENCY SCORE** 100%

Energy efficiency potential of your home

WHAT DOES THE SCORE MEAN?

HOME ENERGY SCORE (HESCORE): The HEScore is based on a 1 – 10 score, with a 10 being a high performing/efficient home with comparatively low energy bills, and 1 being an inefficient/low performance home with comparatively high energy bills, and a score of 5 being considered average. A score considers heating, cooling and hot water end uses as well as insulation, and normalizes for weather and home occupancy. This score is most often provided for existing homes (versus new construction) and is provided as part of DOE's Home Energy Score program which provides consumer-facing materials about energy efficiency. Scores are based on absolute energy use, subsequently for a home with the same features, a larger home scores poorer than a smaller home since it will use more energy. The score is also recognized by the U.S. Department of Housing and Urban Development (HUD) Federal Housing Administration's (FHA) Energy Efficient Home (EEH) Policy. Home Energy Score can be used for participation in Fannie Mae's HomeStyle® Energy Efficiency Mortgage.

- Total energy costs per year are estimated using an average utility cost (per unit of energy) for the State of Missouri ($0.10/kwh for electricity; $0.29/therm for natural gas).
- Actual energy costs per year may vary based on occupant behavior, utility provider, weather patterns, and appliance maintenance/health.
- Relisting 2-7 years after the assessment date requires a free reprint of the Report from us.greenbuildingregistry.com to update energy information.
- This report meets the standards of Missouri Home Energy Certification program administered by the Department of Economic Development Division of Energy.



AI Reports® Form 820.06*

Client File #: | Appraisal File #:

Residential Green and Energy Efficient Addendum

Client

Subject Property: 213 W Forest Ave

City: Columbia | State: MO | Zip: 65203

Additional resources to aid in the valuation of green properties and the completion of this form can be found at http://www.appraisalinstitute.org/education/green_energy_addendum.aspx

The appraiser hereby certifies that the information provided within this addendum:

- has been considered in the appraiser's development of the appraisal of the subject property only for the client and intended user(s) identified in the appraisal report and only for the intended use stated in the report.
- is not provided by the appraiser for any other purpose and should not be relied upon by parties other than those identified by the appraiser as the client or intended user(s) in the report.
- is the result of the appraiser's routine inspection of and inquiries about the subject property's green and energy efficient features. Extraordinary assumption: Data provided herein is assumed to be accurate and if found to be in error could alter the appraiser's opinions or conclusions.
- is not made as a representation or as a warranty as to the efficiency, quality, function, operability, reliability or cost savings of the reported items or of the subject property in general, and this addendum should not be relied upon for such assessments.

Green Building: The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classic building design concerns of economy, utility, durability, and comfort (US EPA). High Performance building and green building are often used interchangeably.

Six Elements of Green Building: A green building has attributes that fall into the six elements of green building known as (1) site, (2) water, (3) energy, (4) materials, (5) indoor environmental quality, and (6) maintenance and operation. The energy and water elements are the most measurable elements of green or high performance housing. Appraisers need savings amounts to develop an income approach to support energy efficient contributory value.

THIRD-PARTY VERIFICATIONS (See types defined in glossary).

The following verified items are considered within the appraisal analysis of the subject property:

Green Certification
Certifications attest that the home meets certain minimum thresholds.

Environmental Protection Agency (EPA):	☐ Indoor airPLUS ☐ WaterSense ☐ ENERGY STAR	
Energy Department (DOE):	☐ Zero Energy Ready Home (ZERH)	
Home Innovation Research Labs NGBS Home Remodel:		
Home Innovation Research Labs NGBS New Home:	☐ Bronze ☐ Silver ☐ Gold ☐ Emerald	
Living Building Challenge (LBC):	☐ Living Building Certified ☐ Petal Certification	
Passivhaus Standard:	☐ PHI Low Energy ☐ EnerPHit ☐ Passive House	
Passive House Institute US:	☐ PHIUS+ 2015	
USGBC LEED:	☐ Certified ☐ Silver ☐ Gold ☐ Platinum	
Other:		
Date Verified: __/__/__	Green Certification Version: ____ Organization URL:	ABOVE VALID ONLY IF CHECKED: ☐ Verification provided by certifying organization

Energy Label
Labels disclose the state of the home's energy assets.

RESNET's HERS Rating (1 to 150): ____ ☐ Sampling Rating ☐ Projected Rating ☐ Confirmed Rating	Estimated energy savings for this home: $___/year @ ___¢/kWh rate. Dated __/__/__ *Energy Savings includes electricity, heating & Cooling. Score below 100 indicates energy costs are expected to be lower than average local code home per square foot. HERS Index Report estimates energy cost based on number of bedrooms plus one. Only a "confirmed rating" is a diagnostic test.*	
DOE's Home Energy Score Score (1 to 10): 9 ☑ Official Score ☐ Unofficial Score	Estimated energy savings for this home: $2,023/year @ ¢/kWh rate. Dated 3/15/2021 *Energy Savings includes electricity, heating & Cooling. Score above five indicates energy costs are expected to be lower than average local home. Home Energy Score estimates energy cost based on state average energy rates and the home's energy features.*	
Other Energy Score: Range (____ to ____): ____	Estimated energy savings: $____/year __¢ kWh rate dated __/__/__ Describe energy label system:	
Date Verified: 3/15/2021	Score or Rating Version: 2020.5.1 Organization URL: ☐ www.resnet.us ☑ www.homeenergyscore.gov ☐ Other: ____	ABOVE VALID ONLY IF CHECKED: ☑ Verification provided by certifying organization

Verified Energy Improvements
Only include improvements with verified documentation.

Explain energy-related improvements: For more details visit: Cost of improvements: $_____ https://us.greenbuildingregistry.com/green-homes/MO10001731		
Date Verified: __/__/__	Certificate of Efficiency Improvements Version: ____ Organization URL: ☐ Other: ____ ☐ energystar.gov/homeperformance	ABOVE VALID ONLY IF CHECKED: ☑ Verification provided by certifying organization

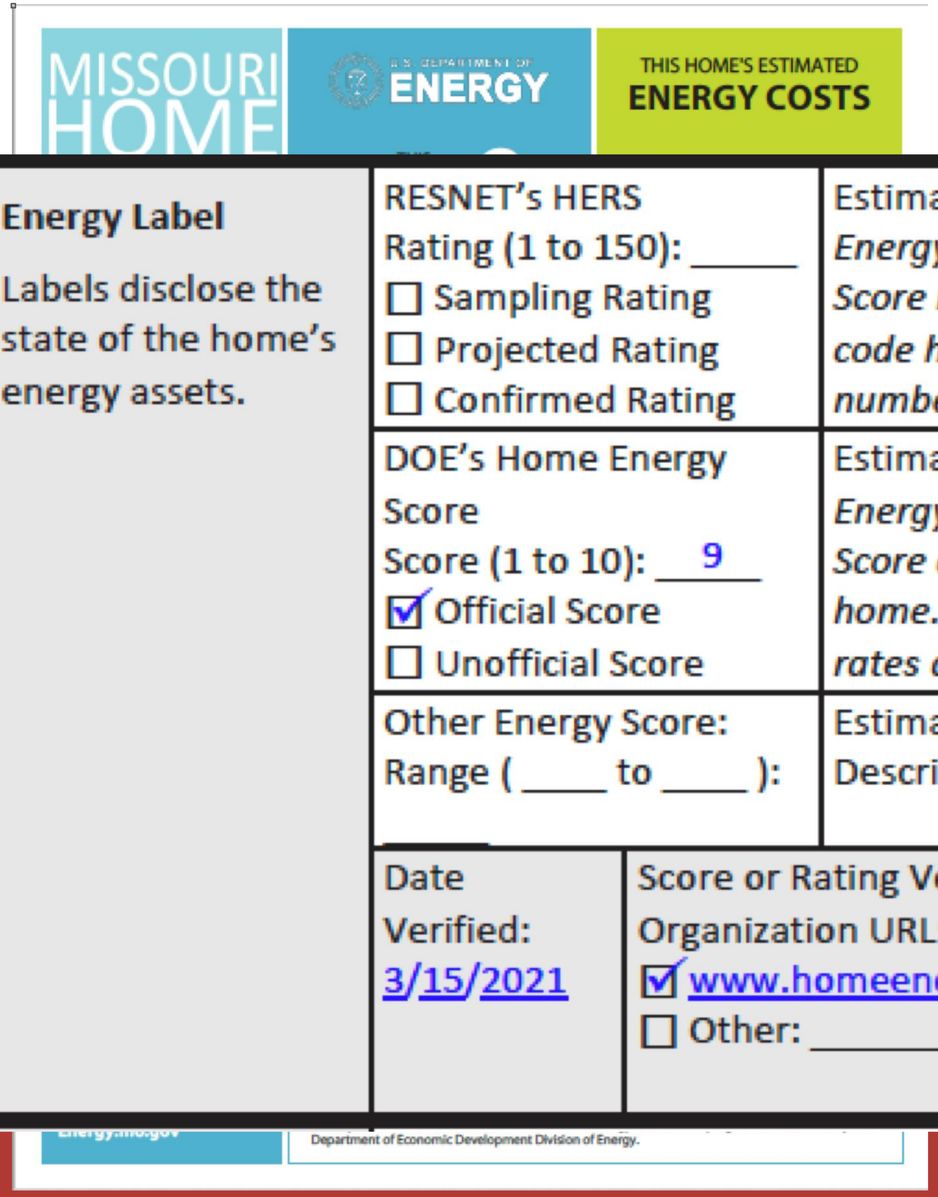
Completed by: Autopopulated from us.greenbuildingregistry.com Title: online database Date: 03/17/2021

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute makes no representations, warranties or guarantees as to, and assumes no responsibility for, the data, analysis or work product provided by the individual appraiser(s) in the specific contents of the AI Reports®. AI Reports® AI 820.06 Residential Green and Energy Efficient Addendum© Appraisal Institute 2017. All Rights Reserved November 2019

Uses:

- Compliance with Ordinances
- Documentation for Listings
- Documentation for Appraisals
- Documentation for Mortgages

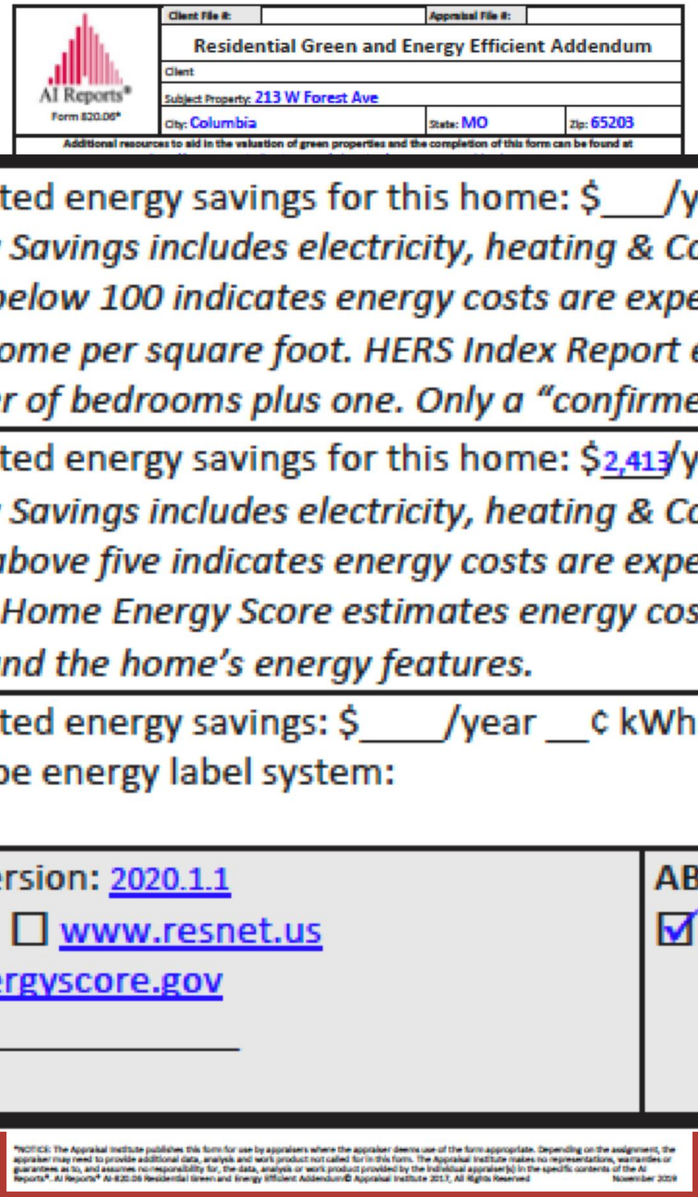
Basis for Automated Valuation Models


MISSOURI HOME

U.S. DEPARTMENT OF ENERGY

THIS HOME'S ESTIMATED ENERGY COSTS

Department of Economic Development Division of Energy.


AI Reports®
Form 820.06*

Client File #: | Appraisal File #:

Residential Green and Energy Efficient Addendum

Client

Subject Property: 213 W Forest Ave

City: Columbia | State: MO | Zip: 65203

Additional resources to aid in the valuation of green properties and the completion of this form can be found at

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute makes no representations, warranties or guarantees as to, and assumes no responsibility for, the data, analysis or work product provided by the individual appraiser(s) in the specific contents of the AI Reports®. AI Reports® AI-820.06 Residential Green and Energy Efficient Addendum® Appraisal Institute 2017, All Rights Reserved November 2019

Energy Label Labels disclose the state of the home's energy assets.	RESNET's HERS Rating (1 to 150): _____ ☐ Sampling Rating ☐ Projected Rating ☐ Confirmed Rating	Estimated energy savings for this home: $___/year 10 ¢kWh rate. Dated __/__/__ *Energy Savings includes electricity, heating & Cooling.* *Score below 100 indicates energy costs are expected to be lower than average local code home per square foot. HERS Index Report estimates energy cost based on number of bedrooms plus one. Only a "confirmed rating" is a diagnostic test.*
	DOE's Home Energy Score Score (1 to 10): 9 ☑ Official Score ☐ Unofficial Score	Estimated energy savings for this home: $2,413/year 10 ¢kWh rate. Dated 3/15/2021 *Energy Savings includes electricity, heating & Cooling.* *Score above five indicates energy costs are expected to be lower than average local home. Home Energy Score estimates energy cost based on state average energy rates and the home's energy features.*
	Other Energy Score: Range (____ to ____):	Estimated energy savings: $____/year __¢ kWh rate dated __/__/__ Describe energy label system:

Date Verified: 3/15/2021	Score or Rating Version: 2020.1.1 Organization URL: ☐ www.resnet.us ☑ www.homeenergyscore.gov ☐ Other: _____	**ABOVE VALID ONLY IF CHECKED:** ☑ Verification provided by certifying organization

Extra Credit - Missouri Gold Certificate

us.greenbuildingregistry.com/green-homes/MO10000002

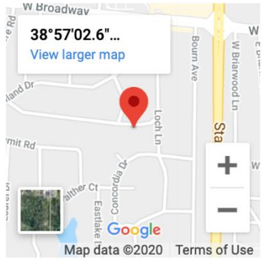
Missouri, USA

Green Building Registry

‹ Back to search

Search nearby homes ›

2310 Braemore Rd, Columbia, MO, 65203



HERS Index	None
Home Energy Score	9
Solar	None

Missouri Home Energy Certification — GOLD

GreenBuildingVerificationType:	**Missouri Home Energy Certification**
GreenVerificationBody:	**Missouri Division of Energy**
GreenVerificationDate:	**2018-12-05**
GreenVerificationRating:	**GOLD**
GreenVerificationSource:	**Columbia Water & Light**
GreenVerificationStatus:	**OFFICIAL**
GreenVerificationURL:	https://rpt.greenbuildingregistry.com/mo_gold/MO10000002-20181205
GreenVerificationYear:	**2018**

Gold Certificate Was Earned from HES=9

The Missouri Division of Energy's Home Energy Certification Program

This home has achieved a superior level of energy performance and includes the following home energy components:

Certified GOLD

Home Address:
2310 Braemore Rd
Columbia, MO 65203

Home Energy Auditor:
Paul Dobbs

Program Provider:
Columbia Water & Light

System And Score:
HES: 9

Certificate Issued:
12/05/2018

Certificate Number:
230515

- **Attic insulation: Ceiling insulated to R-49**
- **Wall insulation: Insulated to R-11**
- **Heating equipment: Natural gas furnace 95% AFUE**
- **Water Heater: Natural gas**
- **Air Conditioner: 14 SEER**

Craig Redmon, Director, Division of Energy

The Missouri Home Energy Certification (MHEC) Program is designed to provide for a voluntary approach to promote energy efficient homes through a clear and meaningful recognition program. For more information regarding the program go to http://energy.mo.gov/energy/mhec

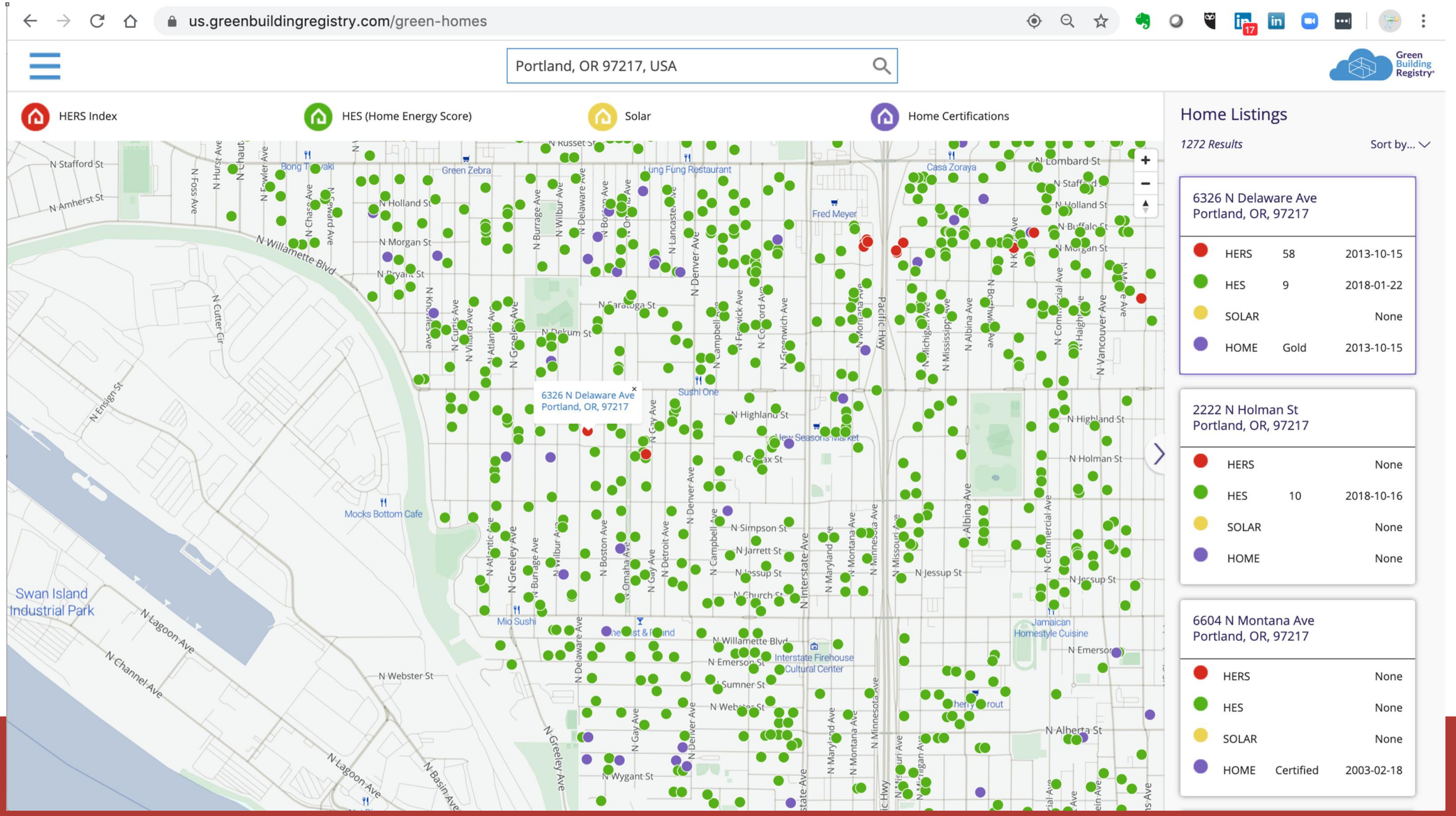
Oregon blazed a different trail…

Oregon tested and compared systems

The Oregon Department of Energy compared sample energy models from REMRate and the Home Energy Score tool for use in creating home energy labels for use in real estate.

- The variance in scores was not acceptable to the Department Director
- The Department settled on use of the HES tool as a cost effective way to produce consistent results.
  UNEXPECTED RESULT

HES/HERS info is juxtaposed in Oregon



Massachusetts is ready to scale

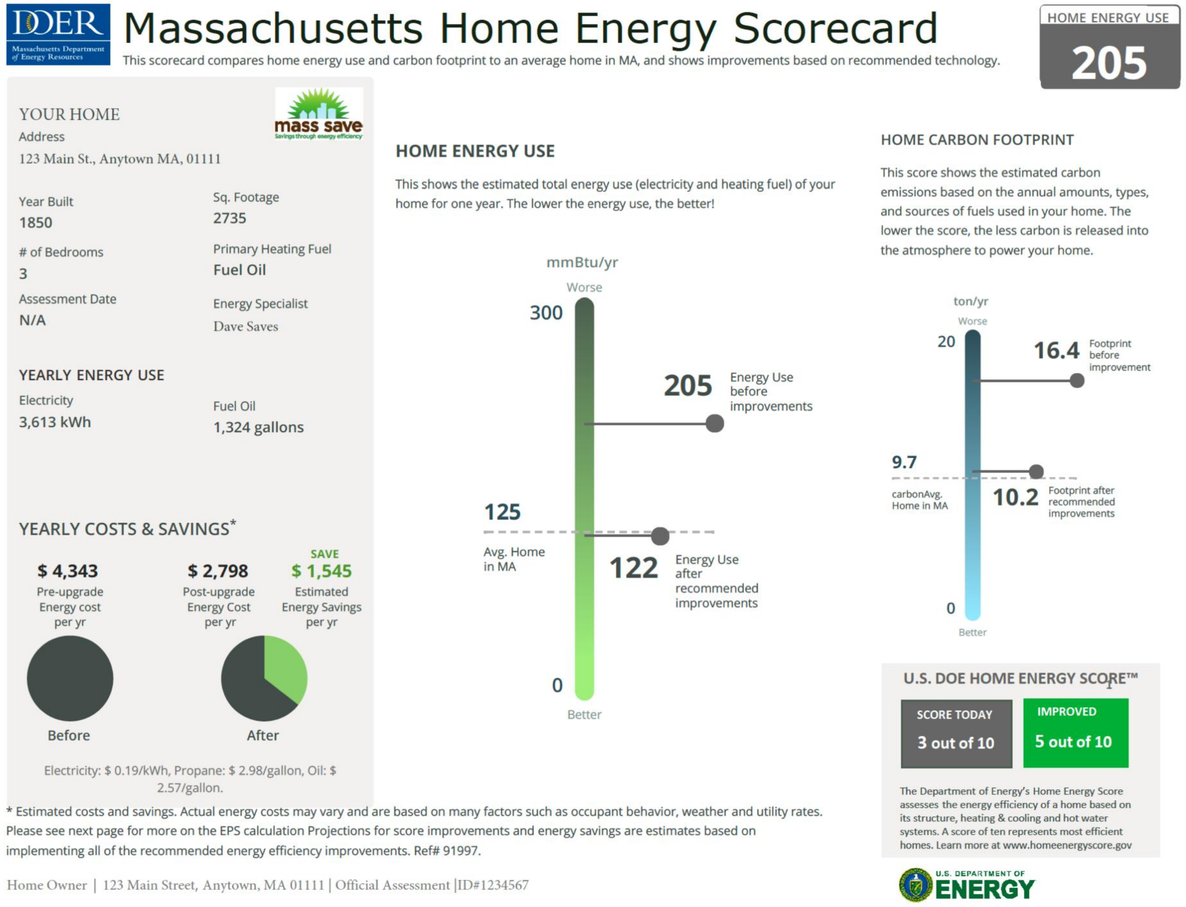
Massachusetts has programs to build on

The Massachusetts energy code allows individual jurisdictions to opt into a stretch code that uses HERS ratings

- 85% of new construction receives a HERS rating

The Mass Save utility programs offer free utility audits to any customer every year.

- Energy Auditors conduct over 30,000 audits a year
- HES label generation is being added to the Energy Audits



DOER Massachusetts Department of Energy Resources

Massachusetts Home Energy Scorecard

This scorecard compares home energy use and carbon footprint to an average home in MA, and shows improvements based on recommended technology.

HOME ENERGY USE
205

YOUR HOME
Address
123 Main St., Anytown MA, 01111

mass save
Savings through energy efficiency

Year Built
1850

Sq. Footage
2735

# of Bedrooms
3

Primary Heating Fuel
Fuel Oil

Assessment Date
N/A

Energy Specialist
Dave Saves

YEARLY ENERGY USE

Electricity
3,613 kWh

Fuel Oil
1,324 gallons

YEARLY COSTS & SAVINGS*

$ 4,343
Pre-upgrade Energy cost per yr

$ 2,798
Post-upgrade Energy Cost per yr

SAVE $ 1,545
Estimated Energy Savings per yr

Before

After

Electricity: $ 0.19/kWh, Propane: $ 2.98/gallon, Oil: $ 2.57/gallon.

HOME ENERGY USE

This shows the estimated total energy use (electricity and heating fuel) of your home for one year. The lower the energy use, the better!

mmBtu/yr
Worse
300
205 Energy Use before improvements
125
Avg. Home in MA
122 Energy Use after recommended improvements
0
Better

HOME CARBON FOOTPRINT

This score shows the estimated carbon emissions based on the annual amounts, types, and sources of fuels used in your home. The lower the score, the less carbon is released into the atmosphere to power your home.

ton/yr
Worse
20
16.4 Footprint before improvement
9.7
carbonAvg. Home in MA
10.2 Footprint after recommended improvements
0
Better

U.S. DOE HOME ENERGY SCORE™

SCORE TODAY
3 out of 10

IMPROVED
5 out of 10

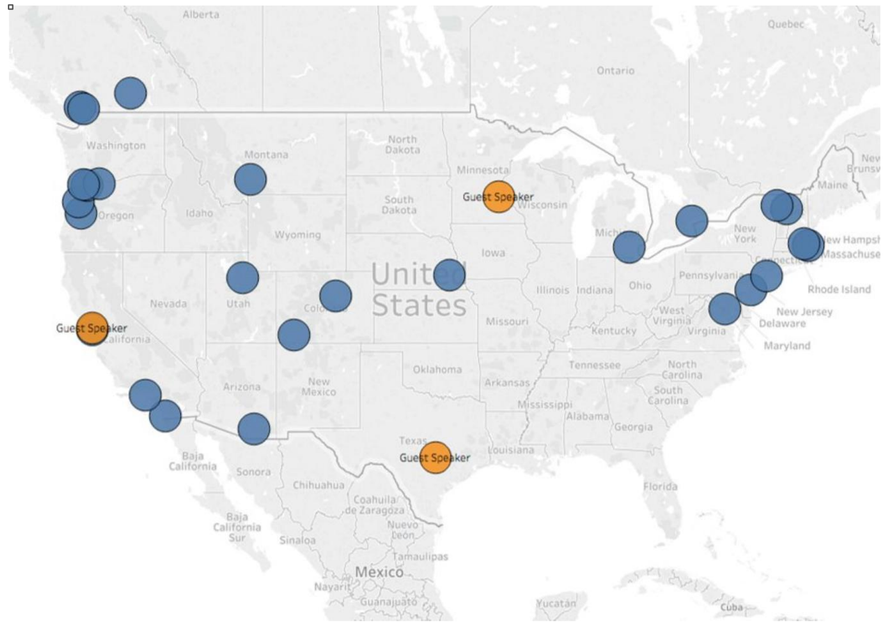
The Department of Energy's Home Energy Score assesses the energy efficiency of a home based on its structure, heating & cooling and hot water systems. A score of ten represents most efficient homes. Learn more at www.homeenergyscore.gov

U.S. DEPARTMENT OF ENERGY

* Estimated costs and savings. Actual energy costs may vary and are based on many factors such as occupant behavior, weather and utility rates. Please see next page for more on the EPS calculation Projections for score improvements and energy savings are estimates based on implementing all of the recommended energy efficiency improvements. Ref# 91997.

Home Owner | 123 Main Street, Anytown, MA 01111 | Official Assessment |ID#1234567

Cities like to replicate a successful policy



Personal Experience

Zillow

Save Share More

$424,900 2 bd | 2 ba | 1,815 sqft

8404 N Haven Ave, Portland, OR 97203

Active | Zestimate®: **$483,144**

Est. payment: $1,973/mo Get pre-qualified

Contact Agent | Take a Tour

Overview | Facts and features | Price and tax history | Monthly

Love this home? Sell your current home to Zillow, and close on your schedule.

Zipcode | Check eligibility

Dig a little deeper…

City of Portland HOME ENERGY SCORE

U.S. DEPARTMENT OF ENERGY

THIS HOME'S SCORE **1** OUT OF 10

THIS HOME'S ESTIMATED **ENERGY COSTS**

$2,353 PER YEAR

HOME PROFILE

LOCATION:
8404 N Haven Ave
Portland, OR 97203

YEAR BUILT:
1904

HEATED FLOOR AREA:
1,611 sq.ft.

NUMBER OF BEDROOMS:
2

ASSESSMENT

ASSESSMENT DATE:
03/03/2021

SCORE EXPIRATION DATE:
03/03/2029

ASSESSOR:
Erin Letterman
A Quality Appraisal, LLC dba A Quality Measurement

PHONE:
503-367-8046

EMAIL:
e.marieletterman@gmail.com

LICENSE #:
217807

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

Better Buildings

Home Energy Score

Average Home

Higher energy use | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Lower energy use

SCORE TODAY

Official Assessment | ID# 334601

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: 19,754 kWh/yr.	$2,173
Natural Gas: 182 therms/yr.	$180
Other:	$0
Renewable Generation:	($0)
TOTAL ENERGY COSTS PER YEAR	**$2,353**

How much renewable energy does this home generate?

____kWh/yr

THIS HOME'S CARBON FOOTPRINT:

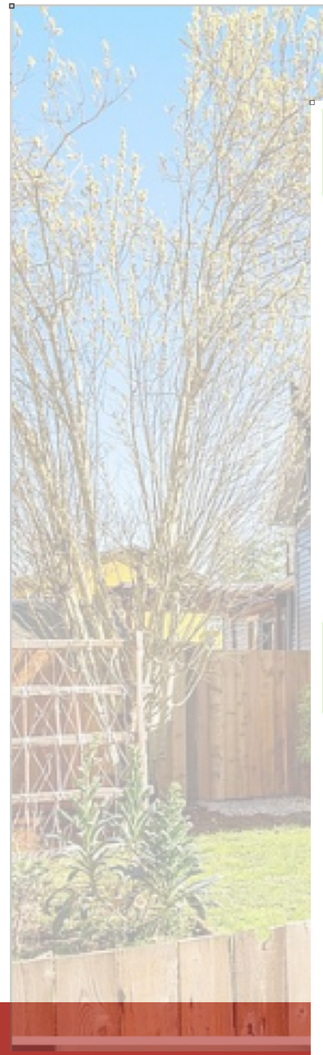
9.0 This Home

15 tons/year WORSE — 0 tons/year BEST

What should my home's carbon footprint be? Between now and 2050, 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 ($0.11/kwh for electricity; $0.99/therm for natural gas; $2.58/gal for heating oil; $2.21/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.**

Ouch!!



U.S. DEPARTMENT OF ENERGY

THIS HOME'S ESTIMATED **ENERGY COSTS**

re

PRIORITY ENERGY IMPROVEMENTS | 10 YEAR PAYBACK OR LESS

FEATURE	TODAY'S CONDITION*	RECOMMENDED IMPROVEMENTS
Attic insulation	Ceiling insulated to R-0	Insulate to R-38 or R-49 if code requires it
Cathedral Ceiling/Roof	Roof insulated to R-0	Insulate cathedral ceiling/roof to R-30 or maximum possible
Envelope/Air sealing	Not professionally air sealed	Professionally air seal
Floor insulation	Insulated to R-0	Insulate to R-30 or fill floor cavity
Heating equipment	Electric heat	When replacing, upgrade to ENERGY STAR, minimum 9.0 HSPF (Heating Season Performance Factor)
Water Heater	Natural gas	When replacing, upgrade to ENERGY STAR, (EF>=0.67 or UEF>= 0.64)

ADDITIONAL ENERGY RECOMMENDATIONS

FEATURE	TODAY'S CONDITION*	RECOMMENDED IMPROVEMENTS
Solar PV	N/A	Visit www.energytrust.org/solar to learn more
Wall insulation	Insulated to R-0	Fully insulate wall cavities
Air Conditioner	N/A	
Basement wall insulation	N/A	
Duct insulation	N/A	
Duct sealing	N/A	
Foundation wall insulation	N/A	
Skylights	N/A	
Windows	Double-pane, clear glass	

Thank You!

Questions?

David Heslam

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earthadvantage.org