DOCKETED	
Docket Number:	23-HERS-02
Project Title:	Whole-House Home Energy Rating and Labeling Pre-Rulemaking
TN #:	256119
Document Title:	April 30, 2024 Presentation - Home Energy Rating and Labeling Pre-rulemaking Workshop
Description:	This is the presentation from the Home Energy Rating and Labeling Workshop on April 30, 2024.
Filer:	Cheng Moua
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	5/1/2024 3:36:00 PM
Docketed Date:	5/1/2024

Good morning and thank you for joining us.

The workshop will begin shortly.

Home Energy Rating and Labeling Program Pre-rulemaking Workshop

Overview and Scope of Proceeding

Cheng Moua, Senior Mechanical Engineer, Efficiency Division - Standards Compliance Branch

April 30, 2024

Please Note for Today's Workshop

- CEC Docket **23-HERS-02**
- Subscribe to **"Home Energy Rating and Labeling"** email list at https://public.govdelivery.com/accounts/CNRA/signup/31719
- Presentation will be posted to the docket
- Workshop is being recorded
- Zoom Issues, contact:
  - Zoom (888) 799-9666 ext. 2
  - CEC Public Advisor publicadvisor@energy.ca.gov or by phone (916) 957-7910

How to Speak or Comment

Participants are muted during presentation

Zoom Application

- Click “raise hand” feature

Telephone

- Press *9 to raise hand
- Press *6 to Mute/Unmute

When called upon

- CEC will open your line
- Unmute on your end
- Spell name and state your affiliation

Alternative is to enter questions in the Q&A window

Today's Agenda

1. Opening Remarks by Commissioner Andrew McAllister
2. General Overview by CEC Staff
   - Authority and Background
   - Request for Information Comments Received
   - Scope of Proceeding
   - Regulatory Process and Major Milestones
3. Presentation by Kaj Isaksen, Danish Energy Agency's Energy Performance Certificates
4. Presentation by Cynthia Adams, Pearl Certification and National Association of Realtors Sustainability Committee member
5. Public Comments

Opening Remarks

Commissioner Andrew McAllister, Ph.D.

CEC Authority and Background

- Warren-Alquist Act establishes CEC and its programs
  - PRC sections 25000 *et seq.*
- California recognized need for standardized home energy rating system since 1990s
- PRC 25942 *Home Energy Rating and Labeling Program* became law

PRC 25942 Home Energy Rating and Labeling Statute

CEC to establish criteria for adopting a home energy rating program which includes…

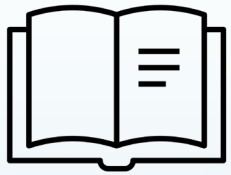
1. Consistent, accurate, and uniform ratings on a single scale
2. Estimates of potential utility bill savings and EEM recommendations
3. Training and certification, and quality assurance procedures for home raters
4. Establishing a centralized database
5. Labeling requirements

Home Energy Rating System Regulations

California Home Energy Rating System (HERS) Program

California Code of Regulations Title 20, Sections 1670 - 1675

Mandatory Field Verification and Diagnostic Testing (FVDT) required by CA Energy Code



Voluntary Whole-house Home Energy Rating and Labeling

What is the Home Energy Rating and Labeling Program?

Primary Purpose: Generating market value for energy efficiency improvements and clean energy features in real estate through labeling

Direct Benefits:

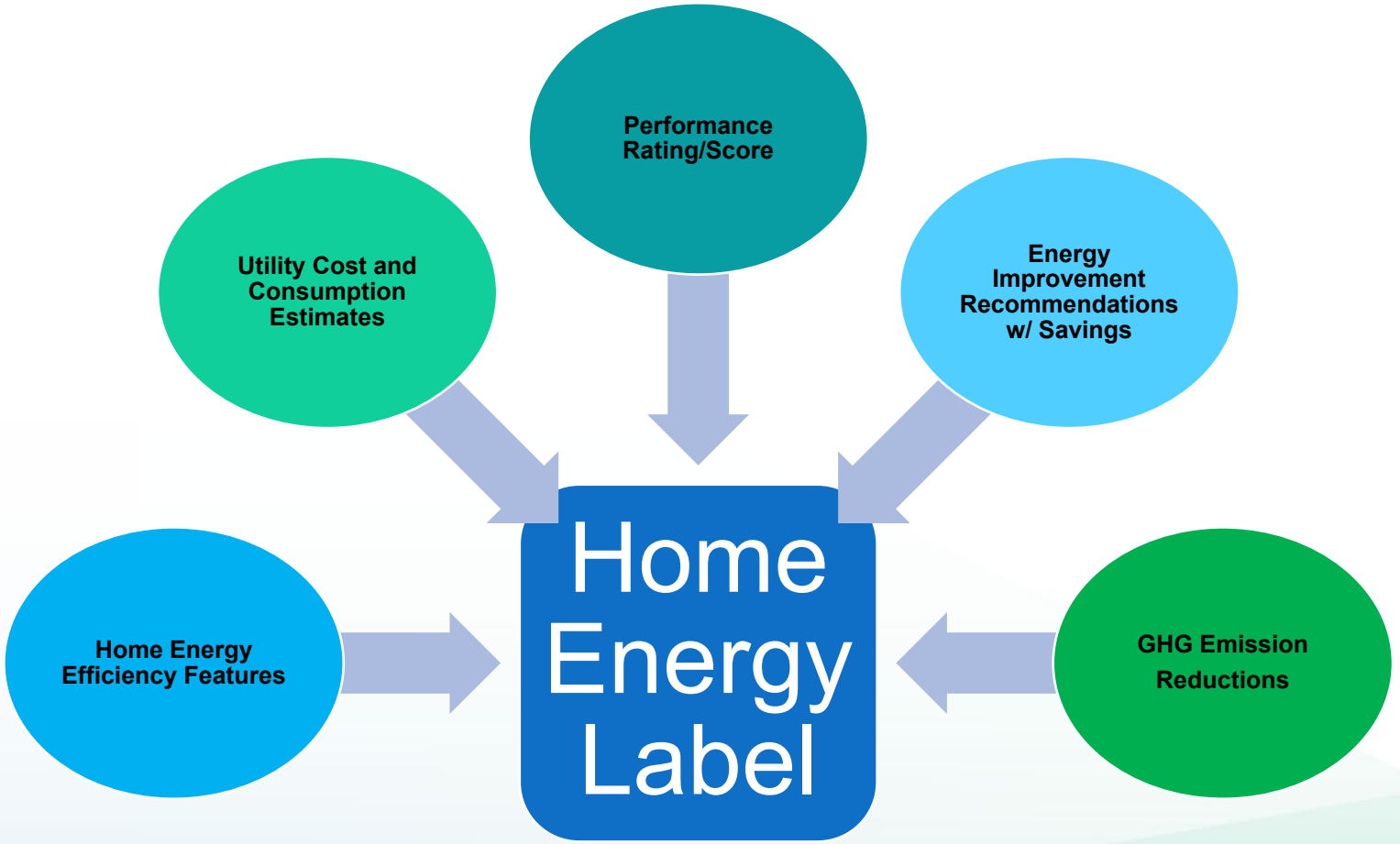
Home Sellers
- Disclose energy characteristics
- Add appraisal value
- Improvement opportunities

Home Buyers
- Awareness
- Shop and compare
- Budgeting ownership costs
- Energy financing

Builders
- Highlights energy features through third-party
- Differentiate from competition
- Values energy features beyond code

Lenders
- Supplementary information on ownership cost
- Tool for energy mortgages

What is the Home Energy Rating and Labeling Program?



The “Miles-Per-Gallon” Label for Homes

What is the Home Energy Rating and Labeling Program?

Major Technical Components

Site Assessment / Data Collection

- Field assessment procedures
- Data collection tools
- Training and certification program for raters
- Quality assurance

Program Software

- Modeling capabilities
- Methods to calculate estimates and generate rating
- Approach for recommended improvements
- Labeling requirements

Home Energy Rating and Labeling Program Regulations to Date

1999

- Created HERS program regulations
- Established operating framework for program, providers, and raters

2008

- Created whole-house provisions
- Implemented whole-house program to meet PRC 25942 (“HERS Phase II”)

Currently

- Software and implementation tools are out of date
- Does not align with current energy programs and codes

Updating the Home Energy Rating and Labeling Program

Major activities to date…

- **October 2023:** CEC approved an Order Instituting Rulemaking to update program
- **November 2023 – Ongoing:** Staff outreach and meetings with stakeholders
- **December 2023 – February 2024:** Staff released a Request for Information solicitating preliminary comments

RFI Comments General Themes

Support update

Current program too complex

Align with national programs

Collaborate with existing programs

Estimates and ratings reasonably accurate is sufficient

Energy consumption and energy efficiency not always correlated

RFI Comments General Themes

Need to be low-cost

Existing homes most important

Ensure alignment with state policy in building decarbonization

Program adoption takes time

Appraising energy efficiency currently specialized knowledge

Motivating action of EE recommendations is priority

Landscape of Current Marketplace

Rating and Labeling

- DOE Home Energy Score
- RESNET HERS Index

Certification

- USGBC LEED for Homes
- Pearl Certification
- Energy Star Certified Homes

International

- European Energy Performance Certificates
- Natural Resources Canada's EnerGuide
- Australia's Nationwide House Energy Rating Scheme

And more…

Scope of Proceeding

Goal is to update and improve the CEC's home energy rating and labeling program by amending the Title 20 HERS regulations

Scope to include:

- Considering how home energy rating and labeling can be applied effectively in real estate to advance energy efficiency
- Seeking information to learn about other programs and tools
- Updating methodology for generating ratings, estimating energy cost and savings, and recommending energy efficiency improvements
- Updating site assessment processes and procedures
- Improving labeling to have most impact for consumers in real estate
- Providing framework that sets criteria for updated program

Objectives and Approach

Key Objectives and Approach
1. Design to an asset rating program
2. Find opportunities to simplify for users and stakeholders
3. Labeling process needs to be low-cost and minimally intrusive
4. Focus first on single family and prioritize existing homes
5. Learn from and align with existing programs and tools
6. Provide label that is concise and easily understood for the layperson
7. Reliable accuracy on estimates and actionable EE recommendations

Areas Seeking to Address

Adoption Strategies

- Barriers and gaps where CEC can seek to improve
- Align and leverage rebates and incentive programs
- Ways to lower labeling cost
- Real estate portal and disclosure needs
- Appraisal and lending use-case opportunities

Program Software

- Existing software, tools, and data sources that can be leveraged
- Modeling capabilities, methodologies, and assumptions
- Minimum software inputs to generate reasonable outputs
- Creating an accurate and uniform statewide rating scale for all homes
- How to tailor to CA policy goals and align with national/federal program and standards

Areas Seeking to Address

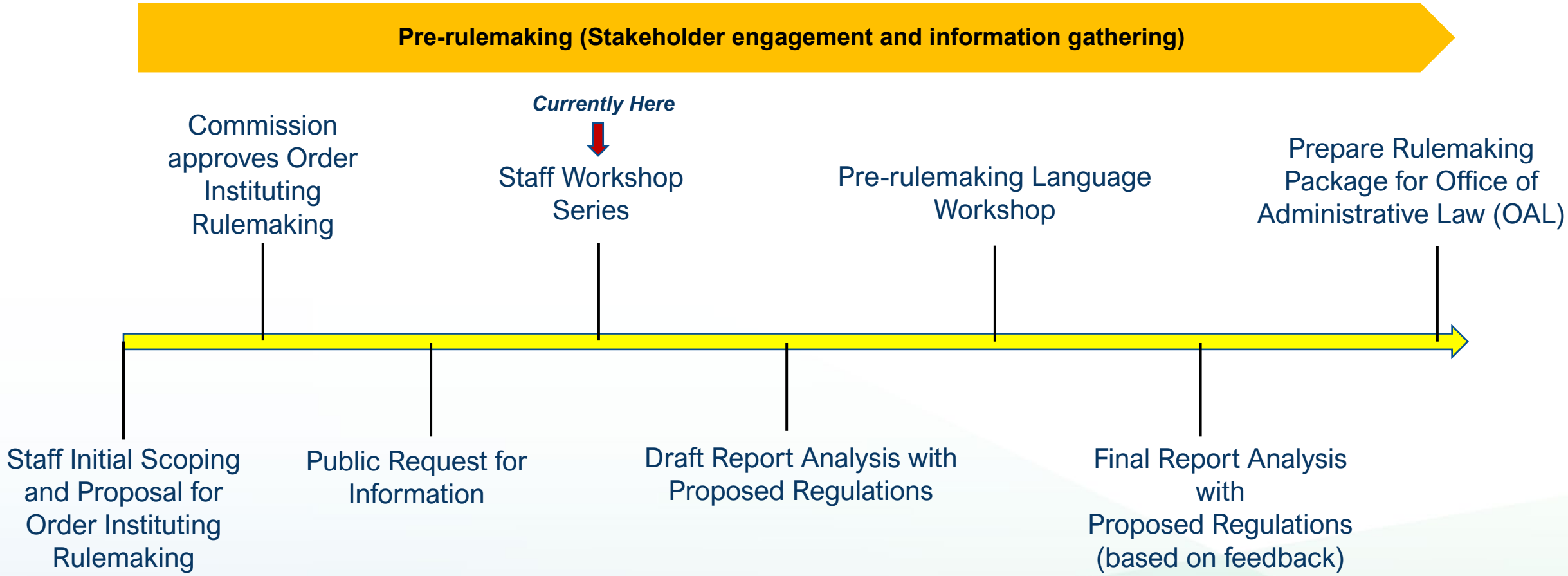
Site Assessment / Data Collection

- Minimum training and certification of raters
- Can existing training and certification programs be leveraged
- Field data collection points and procedures
- Should duct leakage or envelope leakage tests be required
- Level of oversite and quality assurance to ensure integrity and consumer protection, and what those procedures look like

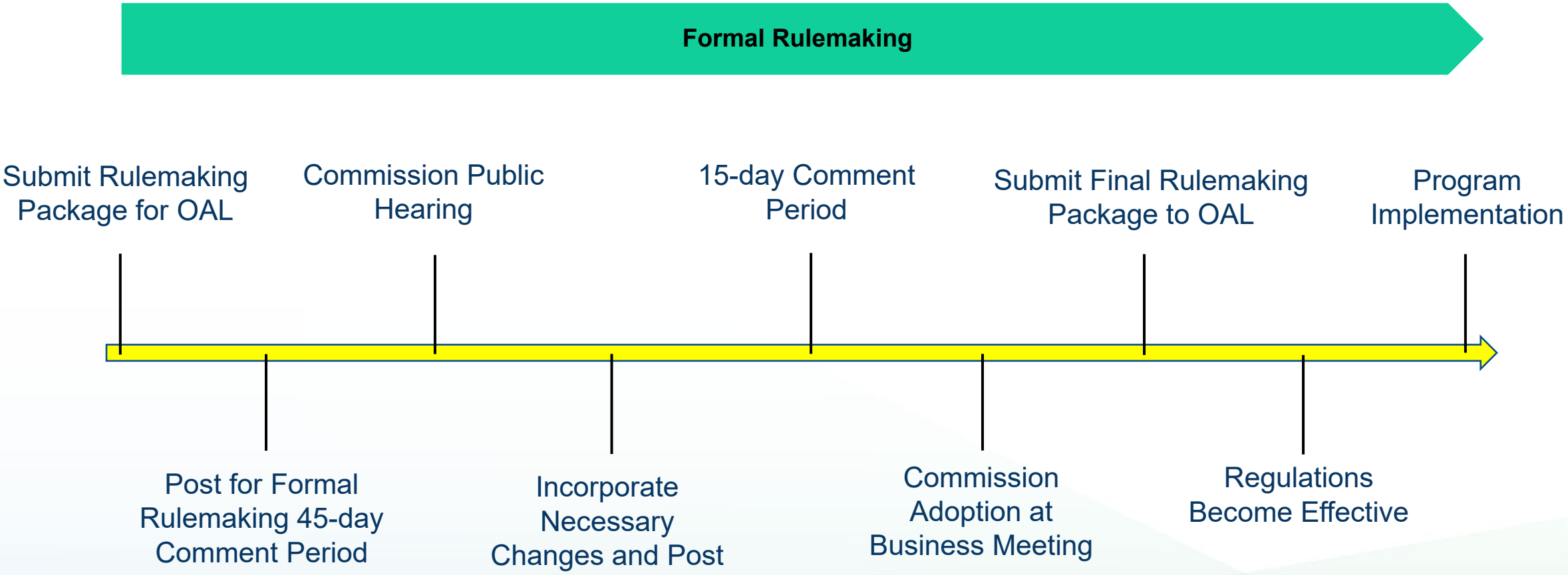
Labeling

- Effective “first glance” design
- What rating scale and granularity
- Information that motivates action
- Information that meets the needs of real estate
- What has worked well for others
- How long should label be effective

Proceeding Major Milestones and Roadmap



Proceeding Major Milestones and Roadmap



Next steps

- Open comment period ending **May 17, 2024**
  - E-commenting to CEC Docket **23-HERS-02**
    https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=23-HERS-02

- CEC will be hosting subsequent workshops specific to:
  - Software approach and methodologies
  - Site Assessment / Data Collection Procedures and Rater Training, Certification, and Oversight
  - Labeling requirements

- Ongoing outreach and engagement with stakeholders

Questions?

Break
10 minutes

Guest Presentation

Kaj Isaksen, Chief Advisor

Danish Energy Agency Energy Performance Certificates

Energy Performance Certificates (EPC) in Denmark

Kaj Isaksen

29. april 2024

Danish Energy Agency

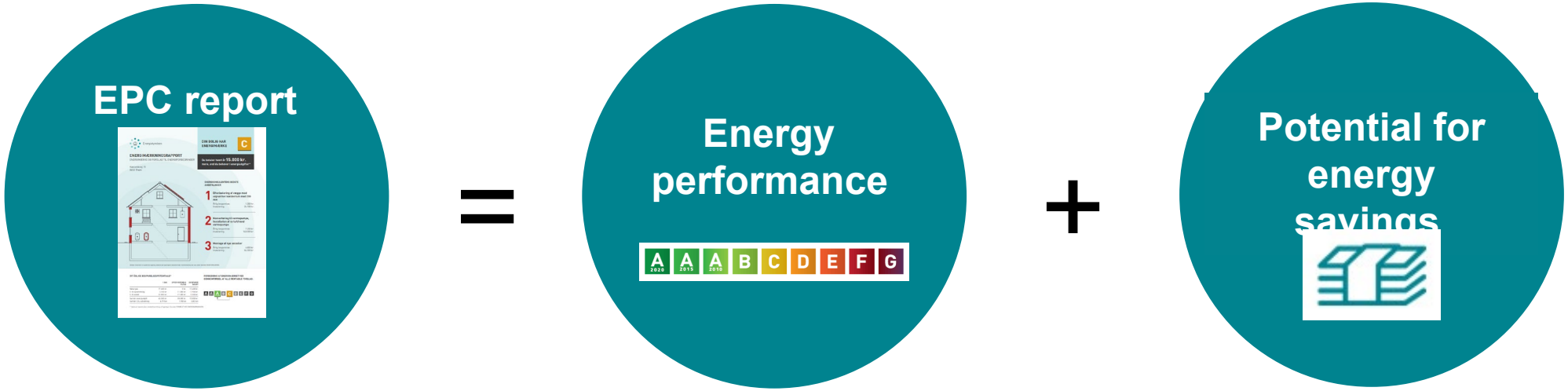
AGENDA

- Background for the EPC-scheme in Denmark
- How EPC reports are made
- Danish EPCs with a focus on nudging
- How EPCs create value in several areas

Danish Energy Agency

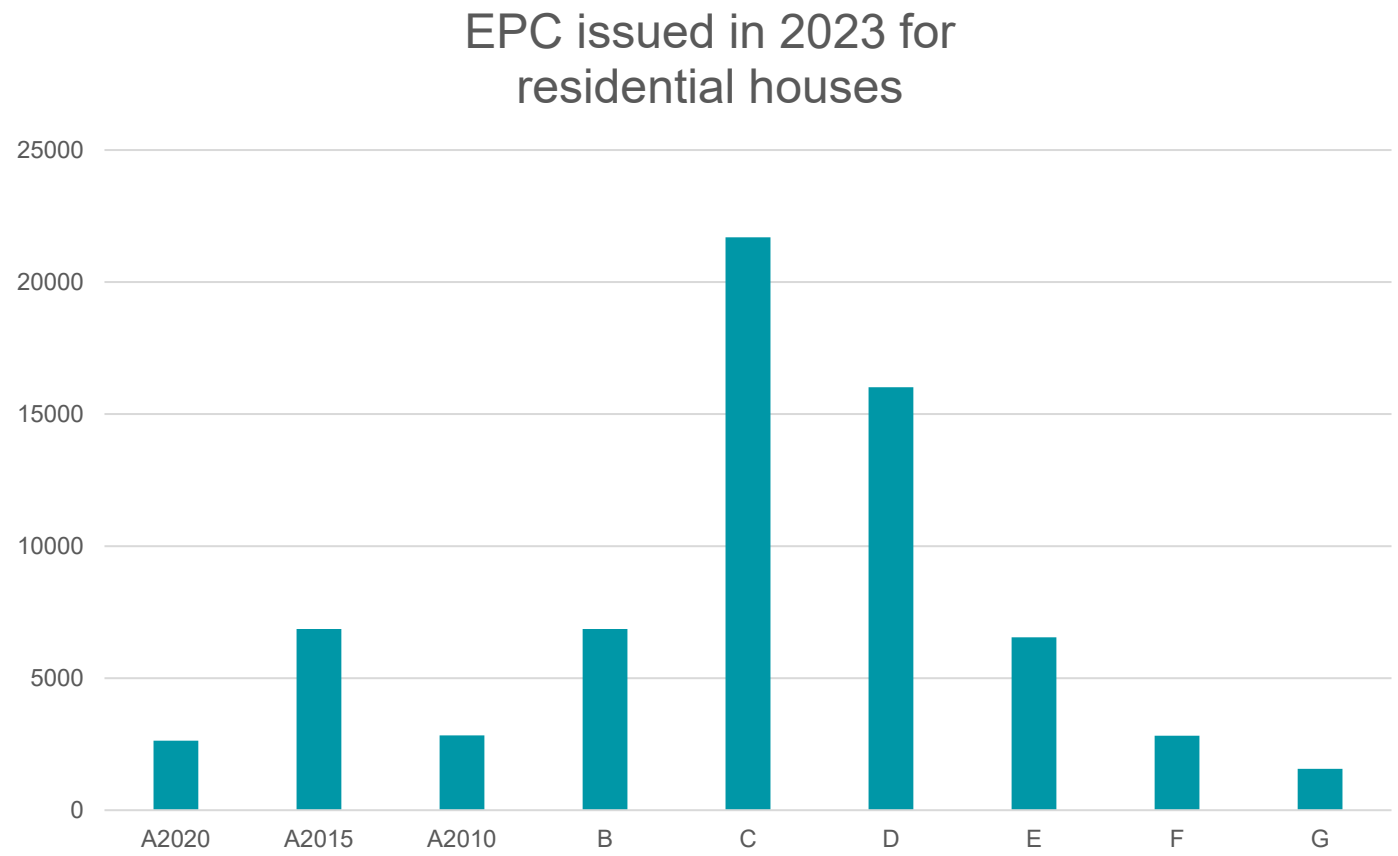
INTRODUCTION

- The EPC scheme is implemented based on the Energy Performance of Building Directive (EPBD), since 2006.
- The aim of energy labeling of buildings is to promote energy savings in Denmark's building stock. An energy labeling consists of two parts, which together illustrate the building's energy state and its potential for saving:
    1. Part of which the building is placed on the energy label scale from A to G.
    2. Part that contains (tailored)suggestions for energy-saving measures in the building.



THE SCALE

- Based on the calculated energy demand per area per year [kWh/m^2/year]
- From A - G makes buildings comparable.
- Subcategories for A that reflect the ongoing improvements for energy requirements for new buildings



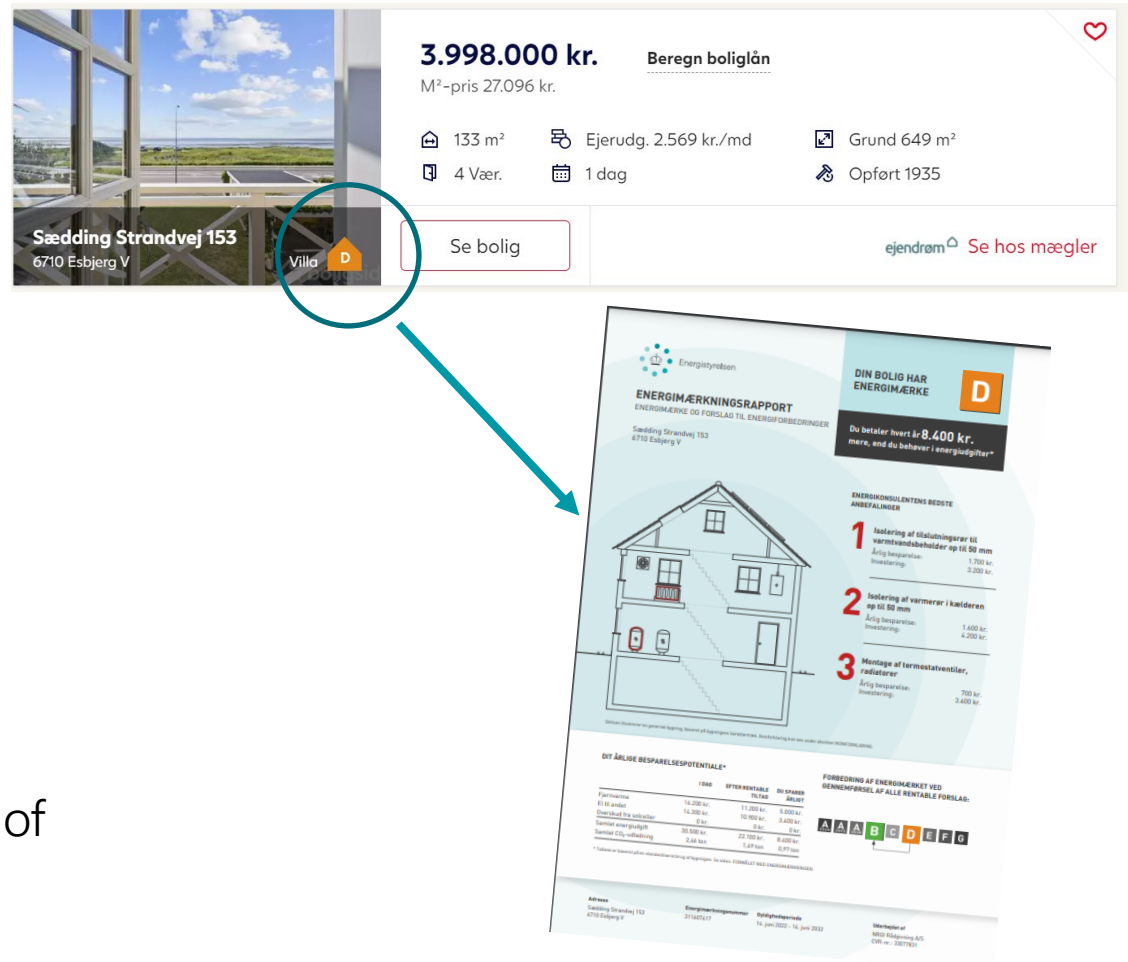
WHICH BUILDINGS MUST HAVE AN EPC

- When shall buildings be labelled?
  - Sale or rent
  - New construction
  - Public buildings over 250 m2

- An EPC is valid for 10 years.
  (If the building is sold several times within the validity period, the same EPC can be used)

- The EPC must be visible in the advertisement when the building is to be sold or rented out.

- In public buildings, the EPC must be visible to the users of the building.



HOW EPC REPORTS ARE MADE IN DK

The EPC for existing buildings contains, among others, the following information collected by a EPC assessor from a **on-site visit**:

> the basic data of the building;

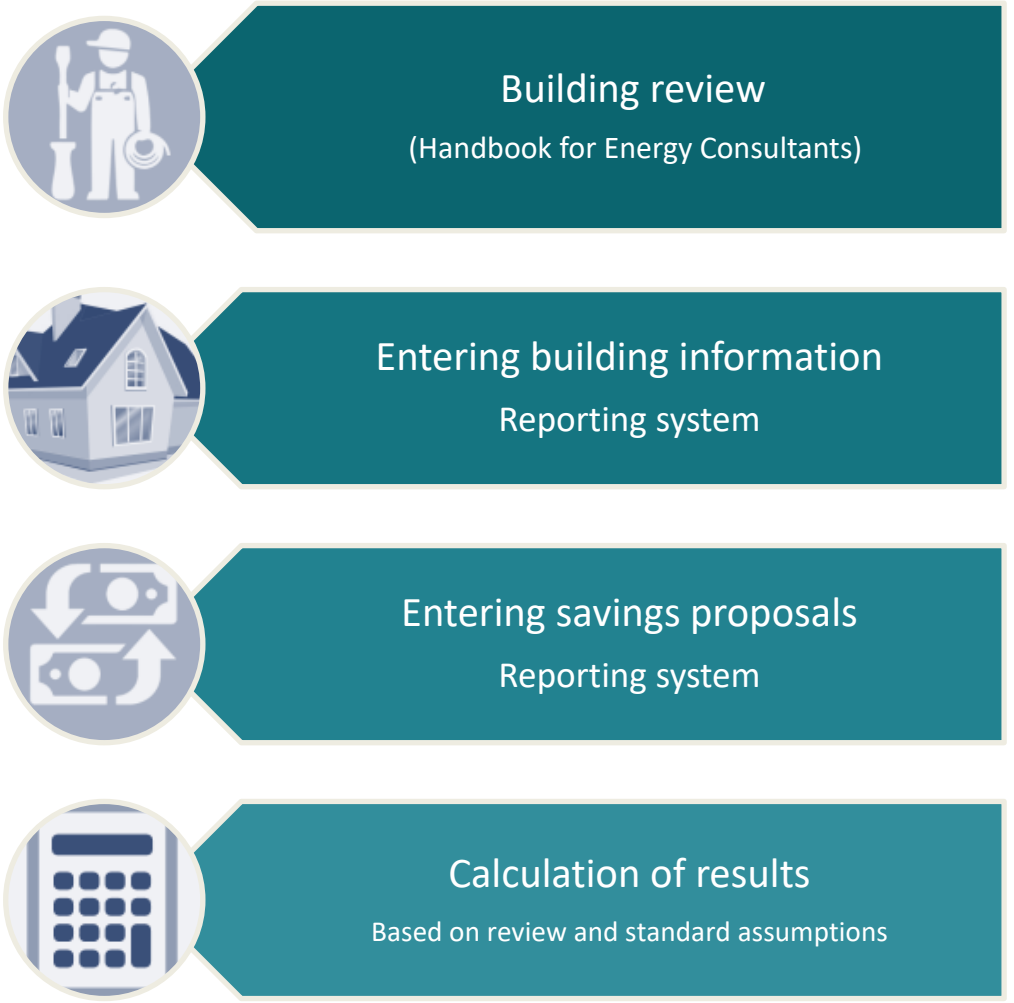
> the energy efficiency rating (A-G);

> the calculated energy consumption;

> the calculated CO_2 emissions;

> a precise description of the building.

The rapport and the background information is stored in a database.



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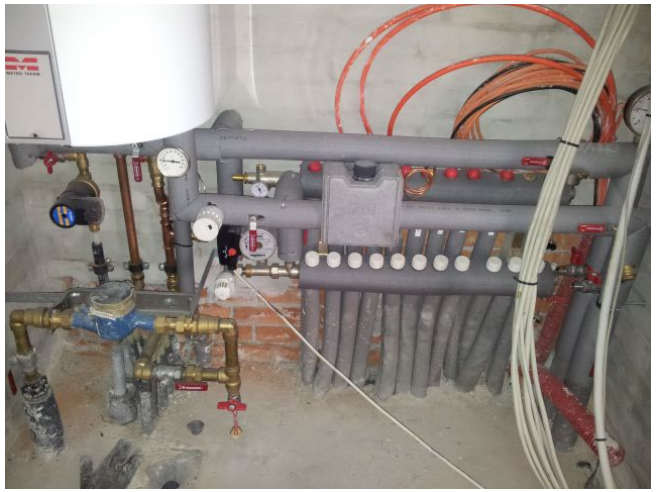
BUILDING REVIEW (ON SITE)

The building
Area
Orientation
Floors, basement

Technical installations
Heating system
Domestic hot water
Pumps
Ventilation
RE sources

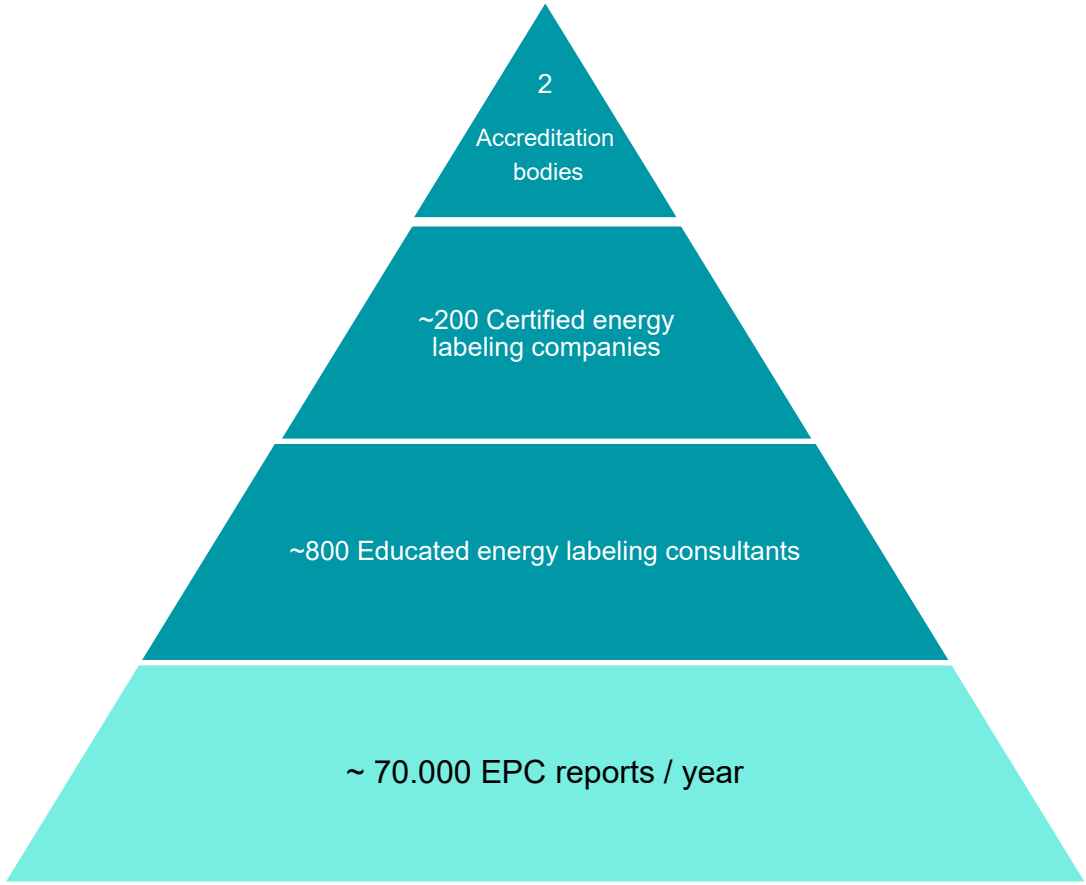
Building envelope
Materials
Construction
Line loss
Windows and doors



WHO CAN ISSUE AN EPC IN DENMARK

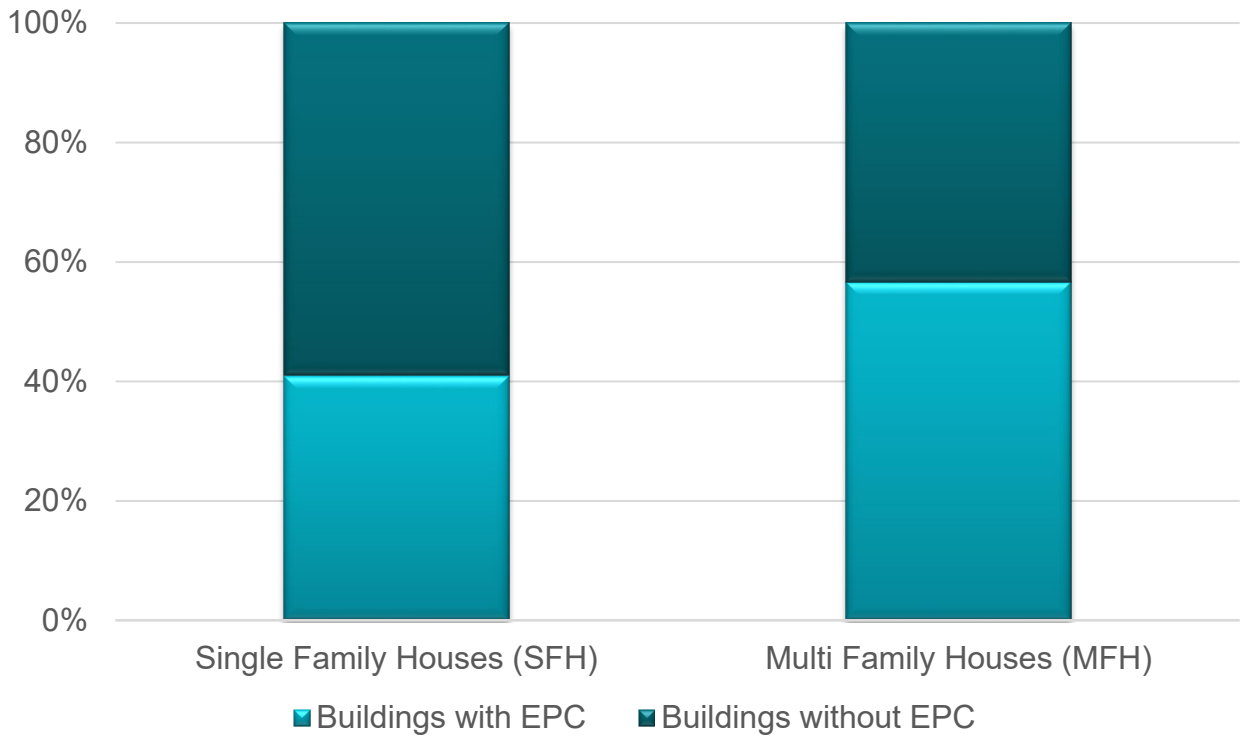
- *From EPBD Article 17 (1): Member States shall ensure that EPCs are carried out in an independent manner by qualified and/or accredited experts.*

- Denmark: EPCs is performed by certified energy consultants employed by a certified energy labeling company.
- A lists of companys who are entitled to carry out energy labeling of buildings is published on the homepage of the DEA.
- The names of certified energy labeling company who have been reprimanded as a result of serious or repeated errors in EPCs will be publicized and the list is also available on the webpage of DEA.



COVERAGE

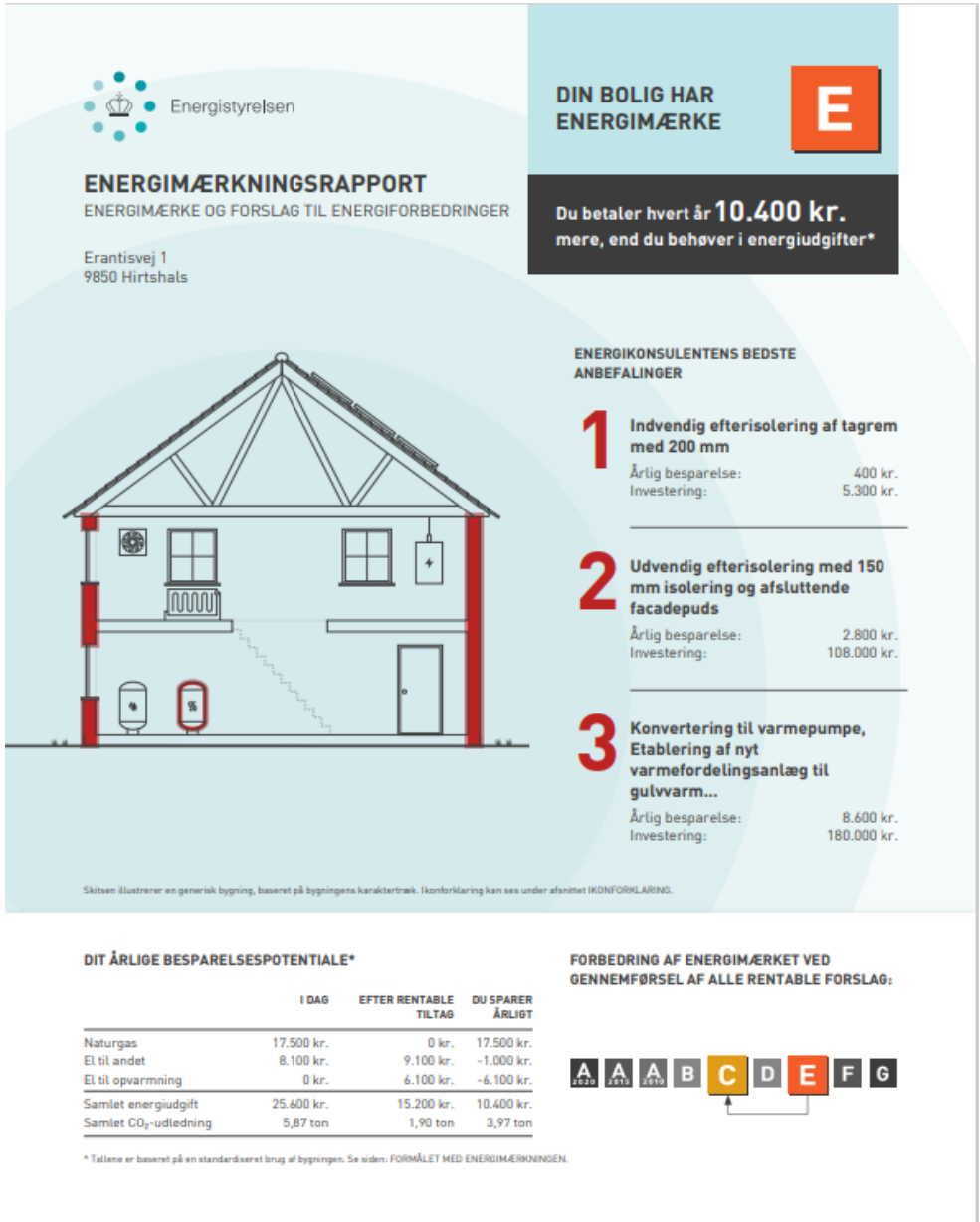
- SFH in 2023: approx. 1,5 mill. houses
    - Of this, approx. 650,000 with an valid EPC.
- MFH in 2023: approx. 110.000 houses
    - Of this, approx. 62.000 with an valid EPC.
- Non-residential is more difficult to calculate, as several buildings are exempt from the EPC requirement.



EPC LAYOUT IN DENMARK

The frontpage:

1. Simple display of how much potential there is for savings
2. A visualisation of which part of the building the recommendations belong to
3. The three best recommendations from the report
4. A detailed budget of the calculation
5. A dynamic showing of the result of implementation of all profitable recommendations



Energistyrelsen

ENERGIMÆRKNINGSRAPPORT

ENERGIMÆRKE OG FORSLAG TIL ENERGIFORBEDRINGER

Erantisvej 1
9850 Hirtshals

DIN BOLIG HAR ENERGIMÆRKE E

Du betaler hvert år 10.400 kr. mere, end du behøver i energiudgifter*

ENERGIKONSULENTENS BEDSTE ANBEFALINGER

1 **Indvendig efterisolering af tagrem med 200 mm**
Årlig besparelse: 400 kr.
Investering: 5.300 kr.

2 **Udvendig efterisolering med 150 mm isolering og afsluttende facadepuds**
Årlig besparelse: 2.800 kr.
Investering: 108.000 kr.

3 **Konvertering til varmepumpe, Etablering af nyt varmefordelingsanlæg til gulvvarm...**
Årlig besparelse: 8.600 kr.
Investering: 180.000 kr.

Skitsen illustrerer en generisk bygning, baseret på bygningens karaktertræk. Ikonforklaring kan ses under afsnittet IKONFORKLARING.

DIT ÅRLIGE BESPARELSESPOTENTIALE*

	I DAG	EFTER RENTABLE TILTAG	DU SPARER ÅRLIGT
Naturgas	17.500 kr.	0 kr.	17.500 kr.
El til andet	8.100 kr.	9.100 kr.	-1.000 kr.
El til opvarmning	0 kr.	6.100 kr.	-6.100 kr.
Samlet energiudgift	25.600 kr.	15.200 kr.	10.400 kr.
Samlet CO_2-udledning	5,87 ton	1,90 ton	3,97 ton

* Tallene er baseret på en standardiseret brug af bygningen. Se siden: FORMÅLET MED ENERGIMÆRKNINGEN.

FORBEDRING AF ENERGIMÆRKET VED GENNEMFØRSEL AF ALLE RENTABLE FORSLAG:

A 2020 A 2015 A 2010 B C D E F G

EPC AFFECTS THE PRICING OF HOUSES

Report from Copenhagen Economics (2016)

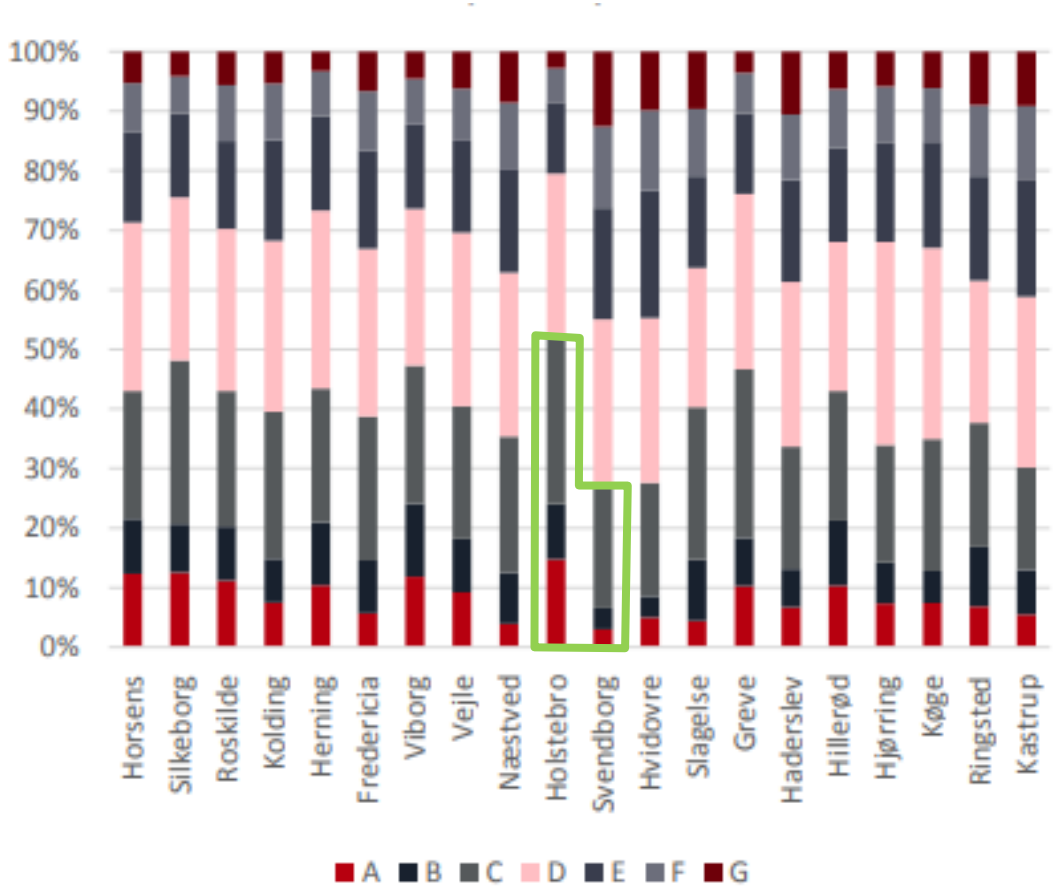
- Approx. 8,630-13,090 USD higher sales price by improving the home from **G to F**
- Approx. 5,900-6,900 USD higher sales price by improving the home from **B to A**

Report from Finance Denmark (2019)

- Based on 40,000 house sales
- Approx. 23,000 USD higher sales price by improving the home from **E to D**
- Approx. 18,700 USD higher sales price by improving the home from **D to C**
- Days on the market:
  - 205 for a house in bad shape
  - 136 for an energy efficient house

DATA TRANSLATED INTO ACTION

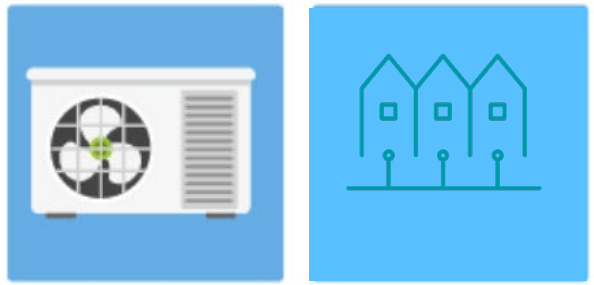
- Earlier launched campaign that is targeted relevant building owners - selection based on analysis of the EPC database.
- The establishment of citizens' meetings can be targeted at relevant cities.
- EPC data is now also used in digital screening tool for municipalities



Some cities have twice as many EFG-labeled buildings as others. (Svendborg vs. Holstebro)

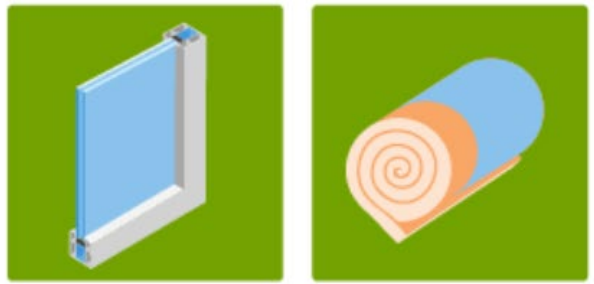
SUBSIDY SCHEMES 2020-2026

- Change of heat source from oil and gas furnace to heat pump or district heating.
- Subsidy for insulation, new windows and ventilation with heat recovery only for houses with E, F or G.
- Application require an EPC.
- Data from the EPC is used in the administration to calculate the subsidy.
- Subsidy are aprox. 10-15 % of cost.



Heat pumps
District Heating

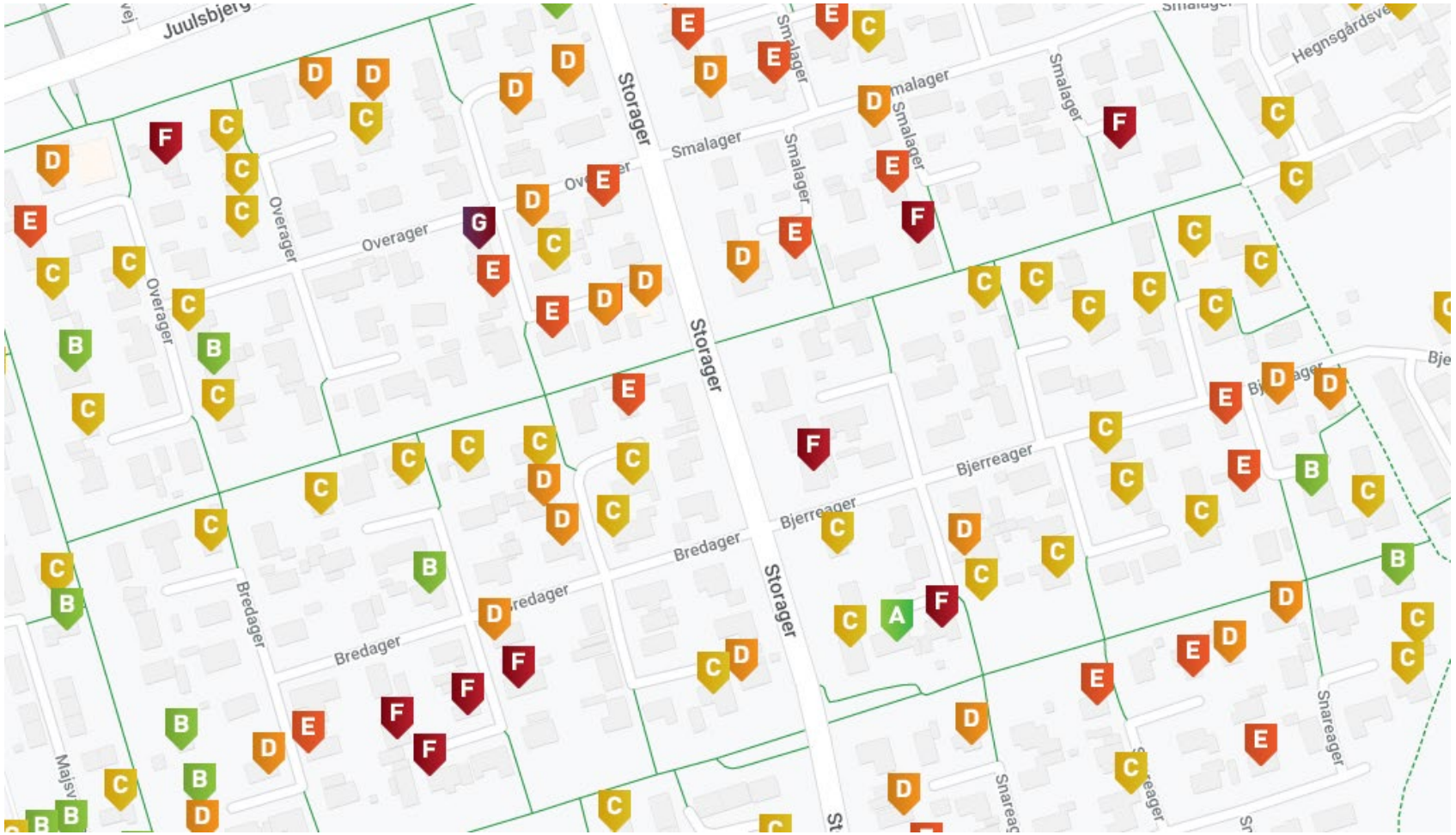
No EPC required



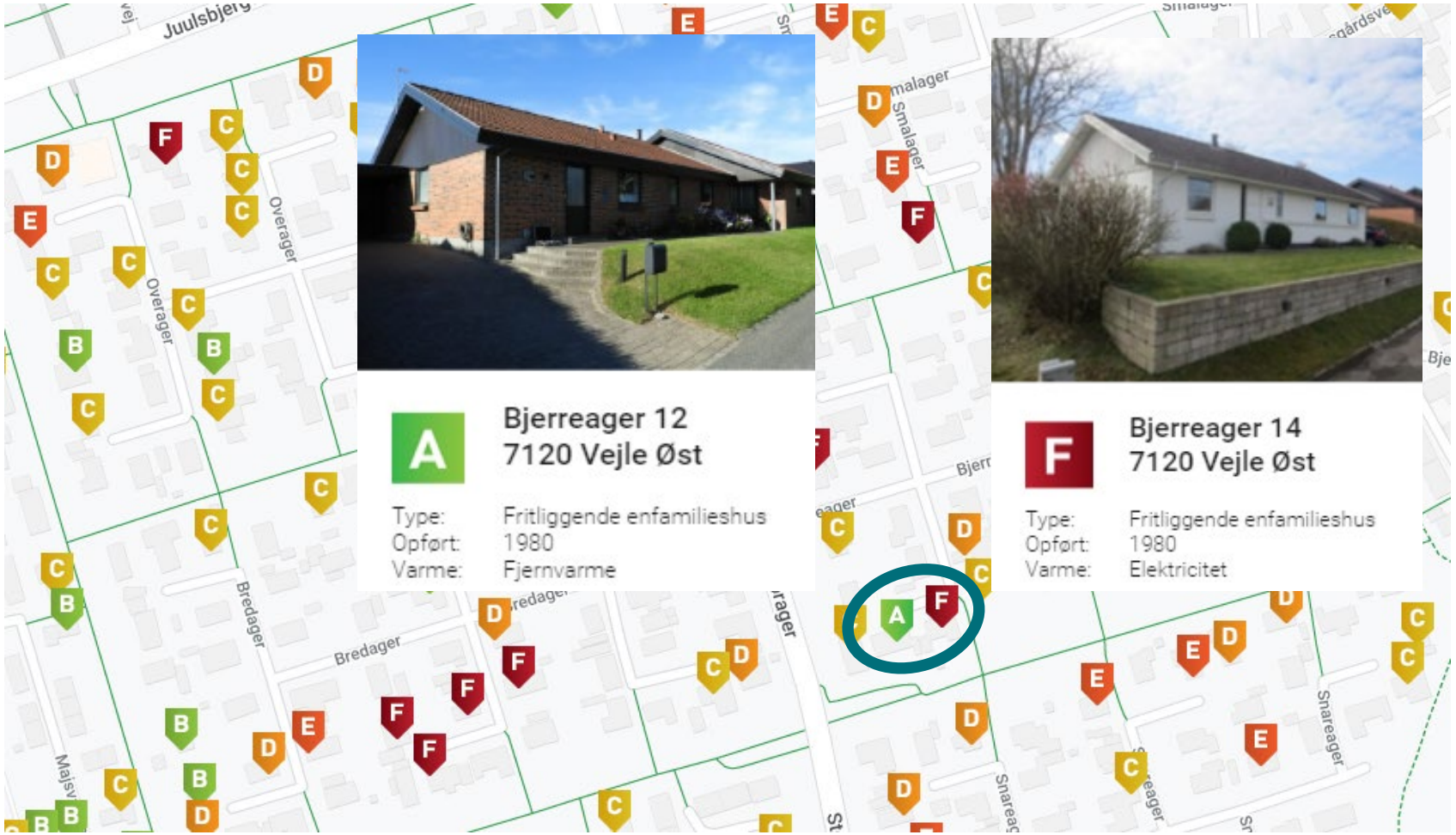
Windows
Insulation
Ventilation

GREENMATCH

EPC MAP - DIGITAL TOOL FOR COMPARISON

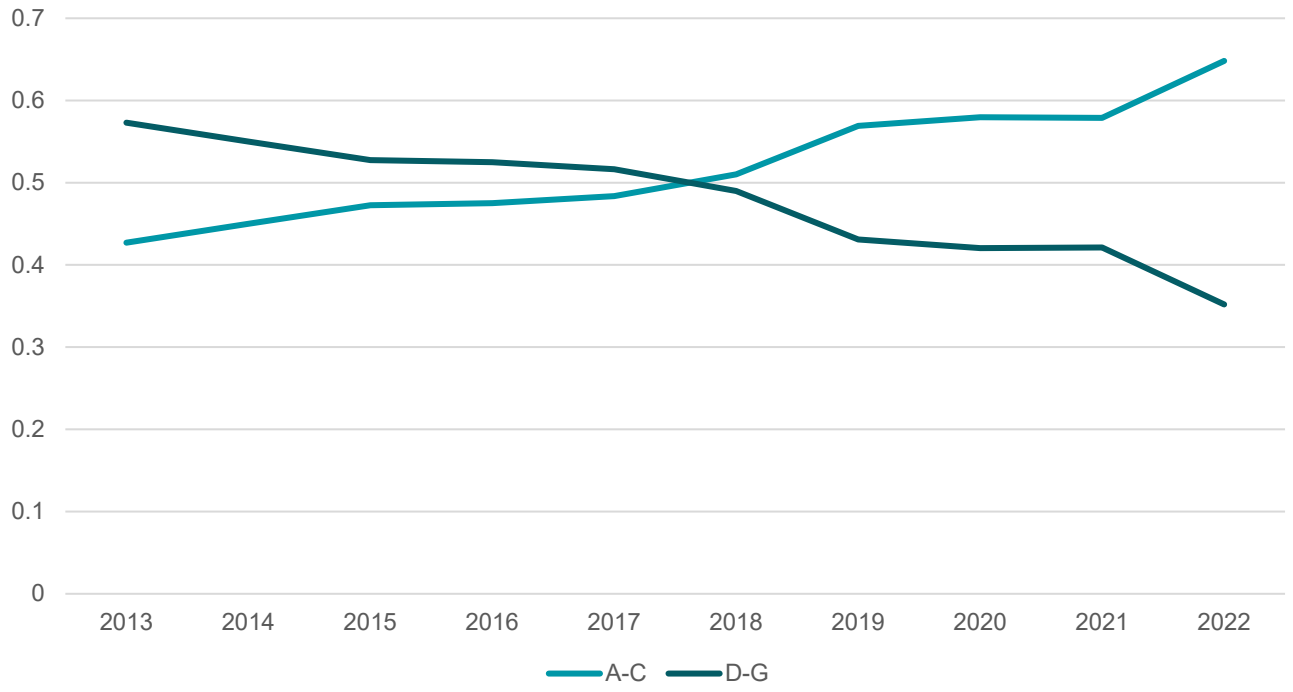


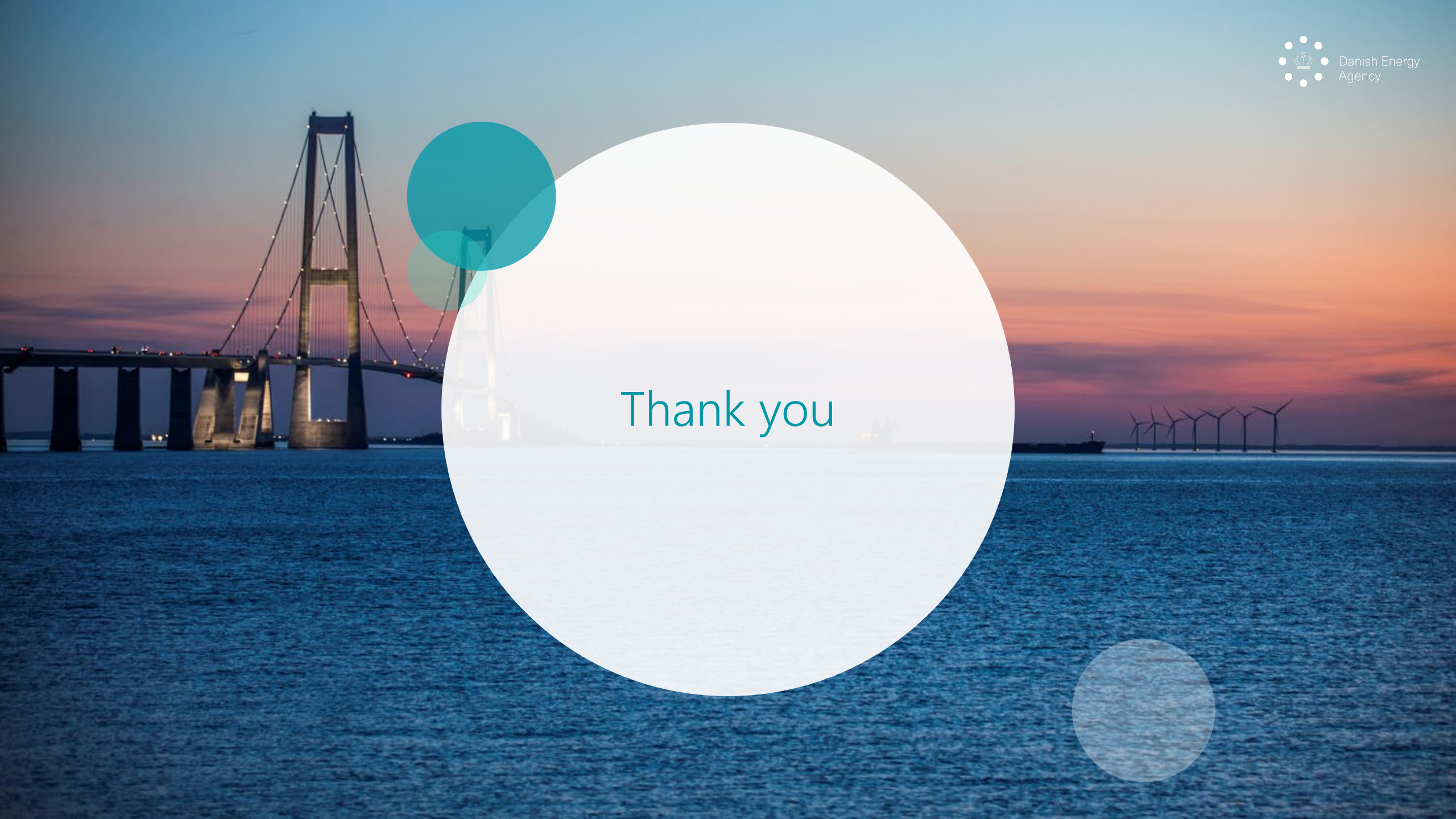
EPC MAP - DIGITAL TOOL FOR COMPARISON



DEVELOPMENT OF THE BUILDING STOCK (WITH EPC)

- Based on the database with collected data for many years, the changes in the Danish building stock can be monitored.
- The sum of the top half of the scale has progressed, and now makes up more than half of buildings with EPC.
- Houses marked C or D accounts for 56 % of all houses.




Danish Energy
Agency
Thank you

Questions?

Guest Presentation

Cynthia Adams, CEO

Pearl Certification and

Member of National Association of Realtors Sustainability Committee

Cynthia Adams,
CEO Pearl Certification, Member NAR SAG

April 30, 2024

NAR Sustainability Advisory Group Perspective on Market Transformation

NAR Sustainability Group Introduction

Sustainability Advisory Group (SAG)

Established in 2018 with a mandate to:

- Evaluate, monitor, analyze and implement means and methods for integrating sustainability into all aspects of residential and commercial real estate.
- Recommend the design, implementation and evaluation of a Sustainability Plan and Triple Bottom Line practices to promote and support sustainability throughout NAR and the real estate sector.
- Provide information and make recommendations to Committees for appropriate creation, revisions, or improvements to policy and programs, as necessary.
- Provide education and information on sustainability-related issues to the Board of Directors and appropriate committees.

NAR SUSTAINABILITY PROGRAM

SAG Composition

Appointed members of the SAG include:

- SAG Chair and Vice Chair
- NAR Executive Committee Member on Sustainability
- Chairs of NAR committees as appropriate, e.g., Land Use, MLS Issues and Policies, Insurance, Smart Growth, Real Property Valuation, etc.
- Green Designee brokers and agents (many are trainers and practice real estate)
- REach company representative

Speaker Background

- Green Builder and LEED AP
- Climate Protection Program Coordinator City of Charlottesville
- Executive Director of LEAP-VA
- Founder and Board Chair Virginia Energy Efficiency Council
- Governor’s Committee on Energy Efficiency
- Governor’s appointment to Virginia Energy Council
- Co-Founder Pearl Certification
- Green Designee and REach representative

Context Setting

MARKET TRANSFORMATION PLAN

25% of states' Electrification and Energy Efficiency rebate programs funding is tied to an approved "Market Transformation Plan," which must:

Describe how the State program will enable the market to recognize the value of homes that have been upgraded through the Home Energy Rebates, including at time of sale/rental. At a minimum, the plan must include a strategy for aggregating home data from the home assessment and/or home certification and making such data available to real estate stakeholders.

Opportunity / Risks with IRA

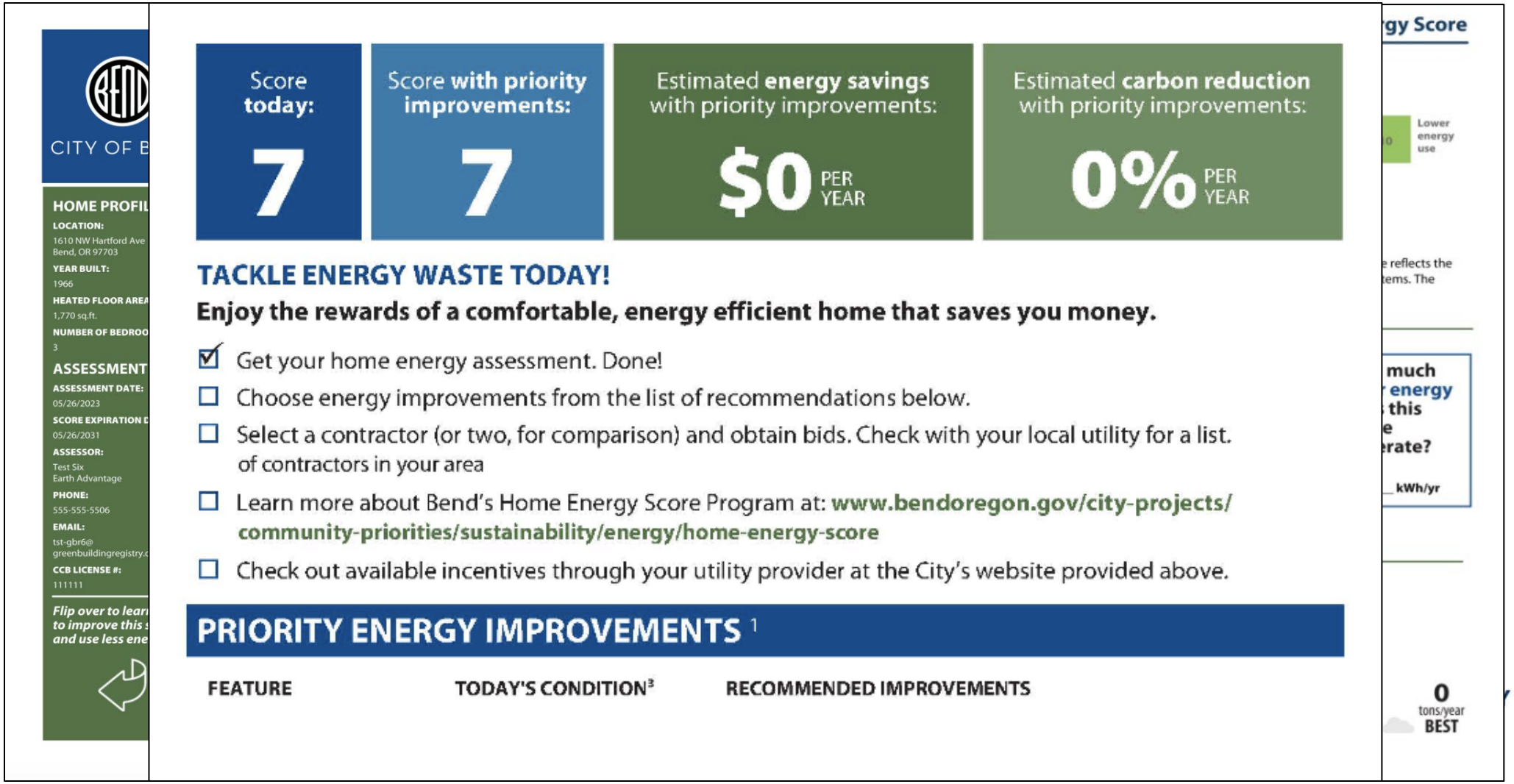
- SAG sees IRA as an opportunity to write a new chapter in relations between real estate and energy efficiency advocates
- Important to help sellers get maximum value for homes
- Important to provide buyers with accurate information that speaks to total cost of homeownership

Risks, though:

- Not engaging real estate associations/GADs in mandating time of sale energy disclosure solutioning creates conflict and mistrust
- Energy efficiency advocates win a battle but not the war: disclosure has no real impact on market transformation

Lessons from Existing Mandates

Bend, OR



CITY OF B

HOME PROFIL
LOCATION:
1610 NW Hartford Ave
Bend, OR 97703
YEAR BUILT:
1966
HEATED FLOOR AREA
1,770 sq.ft.
NUMBER OF BEDROO
3
ASSESSMENT
ASSESSMENT DATE:
05/26/2023
SCORE EXPIRATION D
05/26/2031
ASSESSOR:
Test Six
Earth Advantage
PHONE:
555-555-5506
EMAIL:
tst-gbr6@
greenbuildingregistry.c
CCB LICENSE #:
111111
Flip over to learn
to improve this s
and use less ene

Score **today:**	Score **with priority improvements:**	Estimated **energy savings** with priority improvements:	Estimated **carbon reduction** with priority improvements:
7	7	$0 PER YEAR	0% PER YEAR

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. Check with your local utility for a list. of contractors in your area
- ☐ Learn more about Bend's Home Energy Score Program at: **www.bendoregon.gov/city-projects/community-priorities/sustainability/energy/home-energy-score**
- ☐ Check out available incentives through your utility provider at the City's website provided above.

PRIORITY ENERGY IMPROVEMENTS [1]

FEATURE	TODAY'S CONDITION[3]	RECOMMENDED IMPROVEMENTS

gy Score
Lower energy use
e reflects the
tems. The
much
energy
this
e
erate?
kWh/yr
0
tons/year
BEST

Austin, TX / Minneapolis, MN

- SAG Chairs participated in negotiations for the mandate
- Mandate was for an audit at time of sale and energy score:
  - No blower door
  - Part of disclosure docs
  - Agents who understand building science make the most of it
  - Agents who do not “check the box”
- Outcomes:
  - The sky did not fall
  - Market transformation also did not happen - ***scores/audits are a helpful but insufficient solution***
    - Sellers benefit from some upside
    - Energy efficiency very much an after-afterthought
    - More intel creates modest benefits for buyers
    - Agent support helpful

Boston, MA

- State legislature tried to pass time of sale energy disclosure
- Original SAG Chair and Chief Sustainability Officer of a Boston brokerage testified in favor of time of sale energy disclosure
- Pearl also testified in favor
- NAR MA real estate association testified against the bill - cited concern about costs to transaction and discrimination against low income households, and they won.

As a result: the agent created time-consuming, bespoke reports to market efficient, high-performing homes he sold. Eventually, he found Pearl as a solution. An independent appraisal study found his listings sold for more.

Read his white paper on creating market demand for EE homes here.

Research Question: Could IRA Rebates and Third-Party Certification Lead to Gentrification and Displacement in Communities of Color*

Interviews in Chicago with:

- Real estate broker/"green" Influencer
- Managing broker (involved with fair housing nationally and locally)
- Community activists
- Affordable housing experts

ELEVATE

*Full paper will be published August 2024

Energy Efficiency Investments and Certifications in Disinvested Communities Provide an Opportunity to Begin Redressing Legacies of Injustice.

“Homeownership is not generating wealth for Black people because our homes are not appreciating. Our neighborhoods are devalued and maintaining the home actually depletes our savings. [The IRA] is an opportunity to get significant investment in our houses. **Now we have opportunity to get it right. We want property values to increase, we want people to age in place and build equity.**

- Tonika Lewis Johnson, social justice artist and community advocate

Efforts to avoid gentrification should not limit or delay needed investments in underserved communities.

"**Gentrification happens because of developers who take up real estate, not from energy efficiency upgrades.** Gentrification doesn't occur from individual investment in homes, it comes from collective investment and city investment. This is especially true for Black and Brown neighborhoods because the disinvestment is so deep. **Individual homeowners making energy improvements are not going to spur developers—it's literally just doing good for the homeowner so they can possibly get a bit more than they spent.**"

- Emily Robinson, PreservingUS

NAR SUSTAINABILITY PROGRAM

Displacement can be avoided through active community engagement and investment.

“When you look at real estate people, the perception is that we just make all this money and we don't care about our community. That’s not the truth…**The role of a real estate professional is to value the neighborhoods you support.** As we value those neighborhoods, then others will value them too because we can tell the story.”

- Ezekiel Morris, Owner and Managing Broker, EXIT Strategy

Elevate Energy Recommendations

- Make sure IRA funding gets to Black and Brown neighborhoods.
- Community engagement, include local real estate community
- Help sellers market efficiency upgrades so that sellers realize benefits of upgrades (and buyers understand them)
- Federal, state, and local governments should utilize anti-displacement tools and policies to avoid any negative impacts of home value increases
- **Pamela.Brookstein@ElevateNP.org for more info**

SAG White Paper Recommendations for Market Transformation

White Paper Recommendations

- Engage state association and Government Affairs Directors ***early*** in the planning process
- Support agent and appraiser education
- Give agents the right tools
- Don’t add to agents’ burden with unnecessary expense and complexity

For true market transformation to take hold, solutions must support the sales transaction and ideally the listing flow

NAR SUSTAINABILITY PROGRAM

Engage your NAR State Association

First, read the SAG White Paper on Market Transformation, and second ask these questions of your local real estate partners:

- What is important for energy program administrators to understand about the local real estate industry?
- How can engagement with the real estate community (state association, MLS, and influential brokers) on your market transformation plan support agents, their clients, and the transaction process? What solutions exist today?
- What is a good process by which to work cooperatively to find solutions? Who are the right people to bring to the table?

Support Agent & Appraiser Education

Ideally the state will set aside funding for education that will:

- Highlight the most important features and program elements agents should be able to converse with their clients about
- Incentivize agents to learn more and provide them with basic collateral to share with their clients
- Subsidize appropriate industry trade courses (e.g., NAR's Green Designation or the Appraisal Institute's Valuation of Sustainable Buildings)

Give Agents the Right Tools

Tools that support agents and the sales transaction will:

- Help sellers of energy efficient homes sell for more and sell faster
- Auto-populate agent listings and/or provide clear guidance to agents regarding verified features for MLS data fields
- Explain how certain home features provide certain sought-after quality of life benefits
- Help buyers of inefficient (aka average) homes know what should be improved, in what sequence, and why (home improvement plan)
- Inform buyers of rebates, tax incentives, loans, or other ways to lower the cost to make improvements
- Connect buyers to vetted contractors who can do the work

Tools that SAG Recommends in Market Today

- RESO Data Dictionary 2.0 alignment (includes products rebated through IRA)
- Appraisal Institute's *Green and Energy Efficient Appraisal Addendum*
- Pearl Certification: certification partner, API registry for MLSs and agents, solar equity calculator, MLS Listing Report, Appraisal Addendum, agent home marketing materials, agent & appraiser training, free consumer app Green Door to address home buyer/owner needs
- Green Building Registry: API registry for MLSs and agents

NOTE: Resources and solutions that transcend local MLSs or a strictly regional approach are best if market transformation is the goal.

Pearl Resources

PEARL IS YOUR PARTNER

REACH
NATIONAL ASSOCIATION OF REALTORS®

Provide MLS's data through API

Agent network and training

NATIONAL ASSOCIATION of REALTORS®
REALTOR®
Official Designation

green

Certification and Completed Appraisal Addendum

NAR SUSTAINABILITY PROGRAM

HOME CERTIFICATION PACKAGE

APPRAISAL SUPPORT

AI Reports®
Form 820.05*

Client File #:		Appraisal File #:	

Residential Green and Energy Efficient Addendum

Client: Alan Machuga
Subject Property: 12 Pilgrim Rd
City: Dennis | State: Massachusetts | Zip: 02638-1210

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
	Passivhaus Institute US:	☐ PHIUS+ 2015
	USGBC LEED:	☐ Certified ☐ Silver ☐ Gold ☐ Platinum
	Other: **Pearl Certification**	
	Date Verified: 01/12/2023	Certificate of Efficiency Improvements Version: Organization URL: ☑ Other: www.pearlcertification.com
		ABOVE VALID ONLY IF CHECKED: ☐ Verification reviewed on site ☑ Verification attached to this report
Energy Label Labels disclose the state of the home's energy assets.	RESNET's HERS Rating (0 to 150): **-2** ☐ Sampling Rating ☐ Projected Rating ☑ Confirmed Rating	
	DOE's Home Energy Score Score (1 to 10): ☐ Official Score ☐ Unofficial Score	
	Other Energy Score: Pearl Score Range (0 to 1200): **1102**	
	Date Verified: 01/12/2023	Score or Rating Organization U… ☑ www.resnet… ☐ www.homee… ☑ www.pearlce…

EFFICIENCY FEATURES (Water, Energy, and Environmental. See types defined in glossary).

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

Insulation	☐ Fiberglass Blown-In ☑ Foam Insulation ☐ Cellulose ☑ Fiberglass Batt Insulation ☑ R-Value Wall **R-23** Ceiling **R-46** ☑ Other **R-23 Conditioned basement**				
Building Envelope	Envelope Tightness: **1.5** Unit: ☐ CFM25 ☐ CFM50 ☑ ACH50 ☐ ACH natural Instructions: Insert the rating as a number that could be 0.5 to 7ACH50 or higher. The lower the number, the more air tight the envelope. Building Codes for area show maximum Envelope Tightness allowed based on the climate zone. Not all areas have adopted a building code. http://bcap-energy.org/				
Windows	☑ ENERGY STAR®	☑ Low E	☐ High Impact	☐ Storm	☑ Double Pane ☐ Triple Pane ☐ Tinted ☐ Solar Shades
Day Lighting	☐ # of Skylights:		☐ # of Solar Tubes:	☐ Other (Describe): % of lighting LEDs: **100**	
ENERGY STAR® Appliances	ENERGY STAR®: ☑ Dishwasher ☐ Refrigerator ☑ Washer/Dryer ☑ Other Both Washer and Dryer are ENERGY STAR Energy Source: ☐ Propane ☐ Electric ☐ Natural Gas ☐ Other (Describe): **Note:** ENERGY STAR® appliances do not result in an ENERGY STAR® Home.				
Water Heater	☑ ENERGY STAR®		Size: **55** gallons ☐ Tankless	☐ Solar (next page) ☑ Heat Pump ☐ Coil	
HVAC & Related Equipment	☐ High Efficiency HVAC SEER Efficiency Rating %	☑ Heat Pump Efficiency Rating: COP:		Thermostat/Controllers? ☑ Yes ☐ No Programmable Thermostat? ☑ Yes ☐ No Auxiliary Heat Source? ☐ Yes ☐ No	
comments area.	*Annual Fuel-Utilization Efficiency	SEER: **19.5** EER:		Geothermal? ☐ Yes ☐ No Electric Vehicle Ready? (car charger) ☐ Yes ☐ No	
Indoor Environmental Quality	☑ Energy (ERV) or Heat Recovery Ventilator (HRV) ☑ Other Measured Whole-House Ventilation Device (See glossary) ☐ Humidity Monitoring Device installed			☐ Non Toxic Pest Control ☐ Radon System: ☐ Active ☐ Passive	
Water Efficiency	☐ Reclaimed Water System (Describe): ☐ Greywater reuse system ☐ Water Saving Fixtures			☐ Rain Barrels Used in Irrigation ☐ Cistern size: gallons ☐ Location of cistern:	
Utility Costs	Annual Utility Cost: $ /year, based on: to (full year). Includes (check all that apply): ☐ Electric ☐ Heating ☐ Water ☐ Other:			# Of Occupants:	
Comments Include source for	**The following property has a number of high-performing features as detailed in the Pearl Certification report. According to a 2017 study by Remodeling magazine, air sealing and attic insulation has the highest value-to-cost ratio of any home improvement and was the only improvement to have a ratio higher than 1.0 (i.e., the added**				

Pearl
1031 Deep Creek Ave.
Arnold, MD 21012

Certified on March 20, 2024
Pearl Gold Certificate | Pearl Score: 825

Pearl Certification Discounted Cash Flow Details

Overview

The values presented here are calculated using the Income-Based Approach where our algorithm looks at the total future benefits that the homeowner will receive from the photovoltaic system over its useful life, and calculates what the value of those future benefits is right now.

The useful life of the photovoltaic system is determined by the length of the power production warranty. A system will likely continue to operate after the warranty has expired and in that sense the value presented here is a conservative estimate of the potential value of the system.

System Information	
Ownership Type	Owned
Total System Size (kW)	9.8
Discounted Cash Flow Range	$18,349 - $22,426
Discounted Cash Flow	$20,387

Rates and Costs	
Utility Provider	Baltimore Gas & Electric Co
Utility Plan Name	Residential Service (Schedule R)
Discount Rate	6.82%
Electricity Escalation Rate	2.18%
Operations & Maintenance Costs	$11.50 per kW per year

Solar Panel Array	
Installed Date	April 1, 2024
Manufacturer	SunPower
Model Number	SPR-295E-WHT-U
Array Size (kW)	9.80
Tilt	20
Azimuth	180
Panel efficiency rating	18.09%
Array Type	Roof Mounted - Fixed
Reported Installation Cost	None
Panel warranty (years)	None

Inverter	
Inverter Type	Micro-Inverter
Age Of Inverter	0 years
Warranty (years)	None
Manufacturer	Enphase Energy Inc.
Model Number	-

Power Production Warranty	
Warranty (years)	25
Power at the end of the warranty	92.00

NAR SUSTAINABILITY PROGRAM

RESO GREEN FIELDS REPORT + MARKETING PACKAGE

9960 NW Windover Ln,
Kansas City, MO 64153-2806

Certified on February 03, 2023
Pearl Gold Certificate | Pearl Score: 982

Air Sealing: Top 3% of MO homes

Sooo many benefits with a well-sealed home: from a comfort perspective it's less drafty and has greater humidity control. Bonus: less dust and insects!

All homes should be air sealed to increase comfort, minimize air leakage and enhance the effectiveness of the insulation. This home's performance for air sealing is exceptionally high.

Air sealing typically includes using spray foam on the rim joists, areas where plumbing and electrical penetrations come through walls, around windows/doors, and other areas of the home.

9960 NW Windover Ln,
Kansas City, MO 64153-2806

Certified on February 03, 2023
Pearl Gold Certificate | Pearl Score: 982

Filters: Hospital-grade

The filter for this home's filter cleans the air of mold, mildew, pet dander, pollen, and other particles that can impact allergies or asthma.

The American Lung Association has found that indoor air can be very polluted compared to the outside. This home's special air filter attracts and captures airborne articles and allergens, making for a better indoor environment.

These filters are likely to be nearly as effective as true HEPA (hospital grade!) filters at controlling most airborne indoor particles.

9960 NW Windover Ln,
Kansas City, MO 64153-2806

Certified on February 03, 2023
Pearl Gold Certificate | Pearl Score: 982

Thermostat: Smart home feature

Save money and enjoy the convenience of wifi-enabled heating and cooling control with this high-quality thermostat.

This home's thermostat gives the owner broad control over the home's heating and cooling systems, helping to keep the home at the right temperature and save money.

Plus with real-time control via a phone app, you can adjust the temperature settings no matter where you are - at the office, away on vacation, etc.

12379 Bevan Dr,
Arlington, TN 38002-4889

Certified on September 23, 2022
Pearl Gold Certificate | Pearl Score: 891

Learn more about this Pearl Certified home's benefits: read the free report at www.pearlcertification.com/registry.

Pearl Certification is a national firm that provides third-party certification of **high-performing homes:** homes with "performance assets" that make them **healthy, safe, comfortable, energy and water efficient**. Pearl is an ENERGY STAR Partner.

This Pearl Gold home has verified high-performing assets for a number of features that enhance the quality of life for its owners. Pearl Certified: it's what value *feels* like.

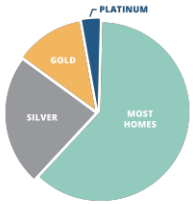
What You Need to Know

This home has many high-performing features, including its heat pump, forced air ducts, attic insulation, attic hatch and filters.

This home will be healthier, more comfortable, cleaner and quieter, and cost less to operate, than most Tennessee homes.

Gold Certified: Special Performance Features of this High-Performing Home

U.S. Homes Eligible for Pearl Certification Levels



Heat Pump: Top 2% of electric-heated homes	Forced Air Ducts: Ducts very well-insulated	Attic Insulation: Top 5% of TN homes
Attic Hatch: Very Well-insulated	Filters: Hospital-grade	Room Ventilation: Lower indoor humidity
Water Filtration System: Cleaner Water	Air Sealing: Top 16% of TN homes	LED Lighting: Very efficient lighting

Social Media Posts: 12379 Bevan Dr, Arlington, Tennessee

HEAT PUMP

12379 Bevan Dr, Arlington, TN 38002-4889 just hit the market, and one of the stand-out features is the high-efficiency heating and cooling system. When you consider that this accounts for almost half of a home's energy bills, this heat pump system is a huge value-add for any buyer. It's what helped the home earn Pearl Gold Certification and is one of many features that make this property worth a look. [Link to listing]

12379 Bevan Dr, Arlington, TN 38002-4889
Verified MLS Green Fields Listing Sheet (RESO Green Fields Report)

This property's home performance features map to the MLS fields below. Please see accompanying Pearl Home Certification Report for documentation of the features' technical specifications.

Green Marketing Group

Attic/Crawl Hatchway(s) Insulated

Insulation

Electric Water Heater

Lighting

Humidity Control

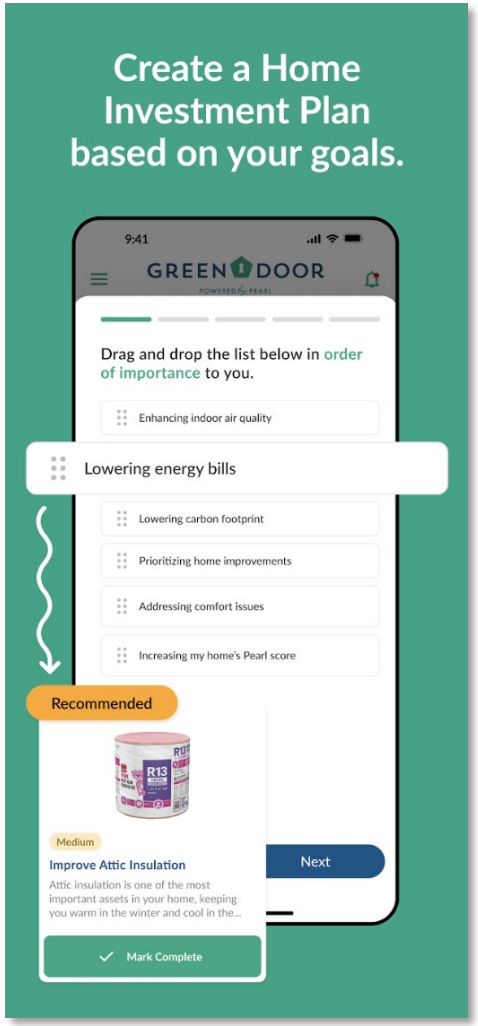
Humidity Control (Heating)

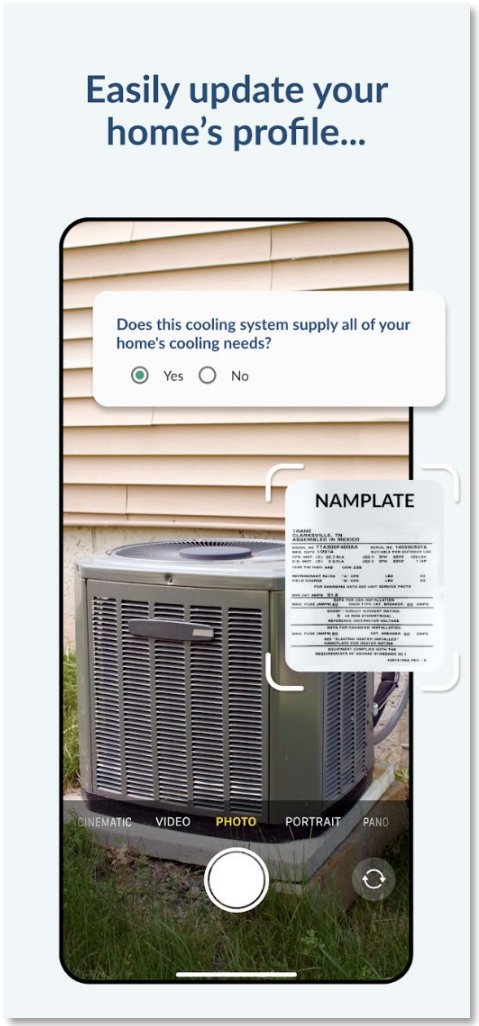
Carbon Monoxide Detector(s)

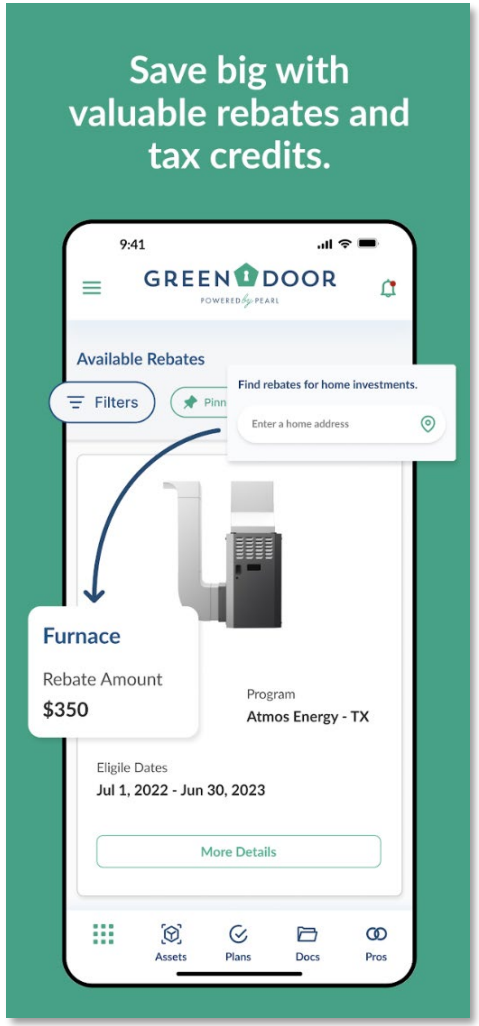
HVAC

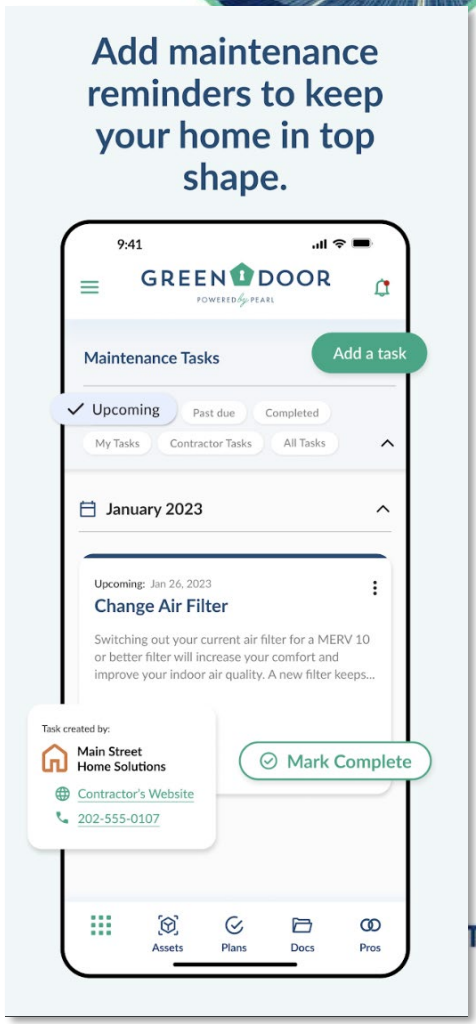
Forced Air

HOMEOWNER APP: GREEN DOOR CONNECTS BUYERS TO THEIR AGENT









Questions?

cynthia@pearlcertification.com

NAR SUSTAINABILITY PROGRAM

Questions?

Open Comment Period

Closing Remarks

Open comment period ending May 17, 2024

- **E-commenting to CEC Docket 23-HERS-02**
  https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=23-HERS-02

Cheng Moua, P.E.

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Thank You!