Energy Efficient Mortgages Initiative

Energy Efficient Mortgages Pilot Scheme Event

Official Launch of the Pilot Scheme, 14 June, Windsor, UK

Energy Efficient Mortgages Initiative

Welcome & Pilot Scheme Introduction

Luca Bertalot,
EMF-ECBC

Energy Efficient Mortgages Initiative

Banks can Play a Game Changing Role in Improving Energy Efficiency (EE)

In the EU 28 there are…

510 million people

7498 MFIs and 188,109 branches

247 million dwellings

…of which

More than 350 million live under their own roof

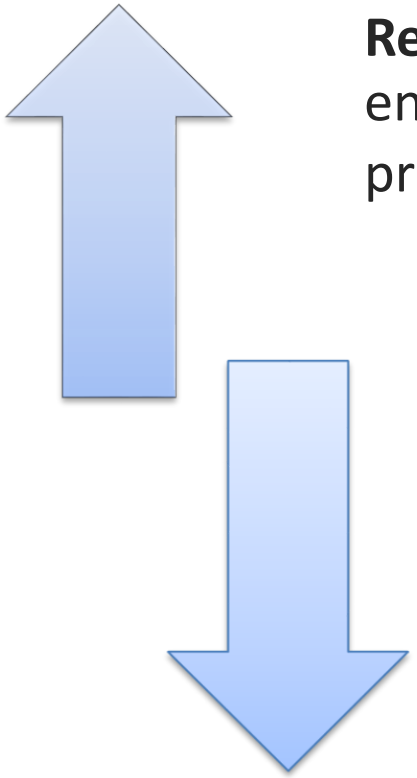
Private financing

On average each branch serves around 2,700 people

more than 220 million dwellings were built before 2001

This initiative has huge potential!

Underlying risk parameters impacted by EE



Retrofitting impacts positively on property value ensuring **wealth conservation** & **loss mitigation** by preventing "brown discount"

EE leads to a reduction in the impact of energy costs to income, reducing borrowers' **probability of default**

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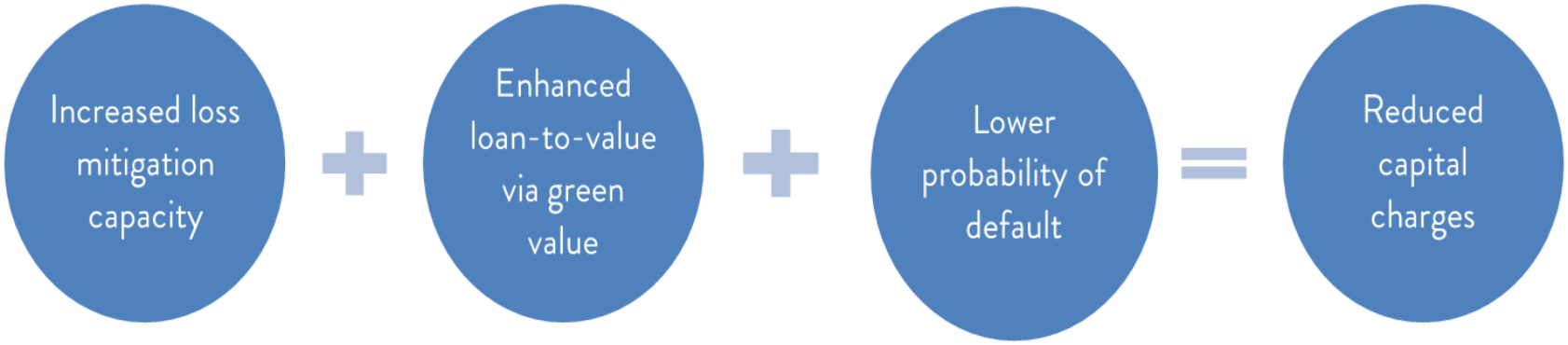
Objective & Underlying Business Case

The **ultimate objective** is a pan-European private bank financing mechanism, based on a standardised approach, to encourage energy efficient improvement by households of the EU's housing stock by way of financial incentives linked to the mortgage, and in this way support the EU in meeting its energy savings targets. Independent from, but complementary to, public funds or tax incentives.

Underlying business case:



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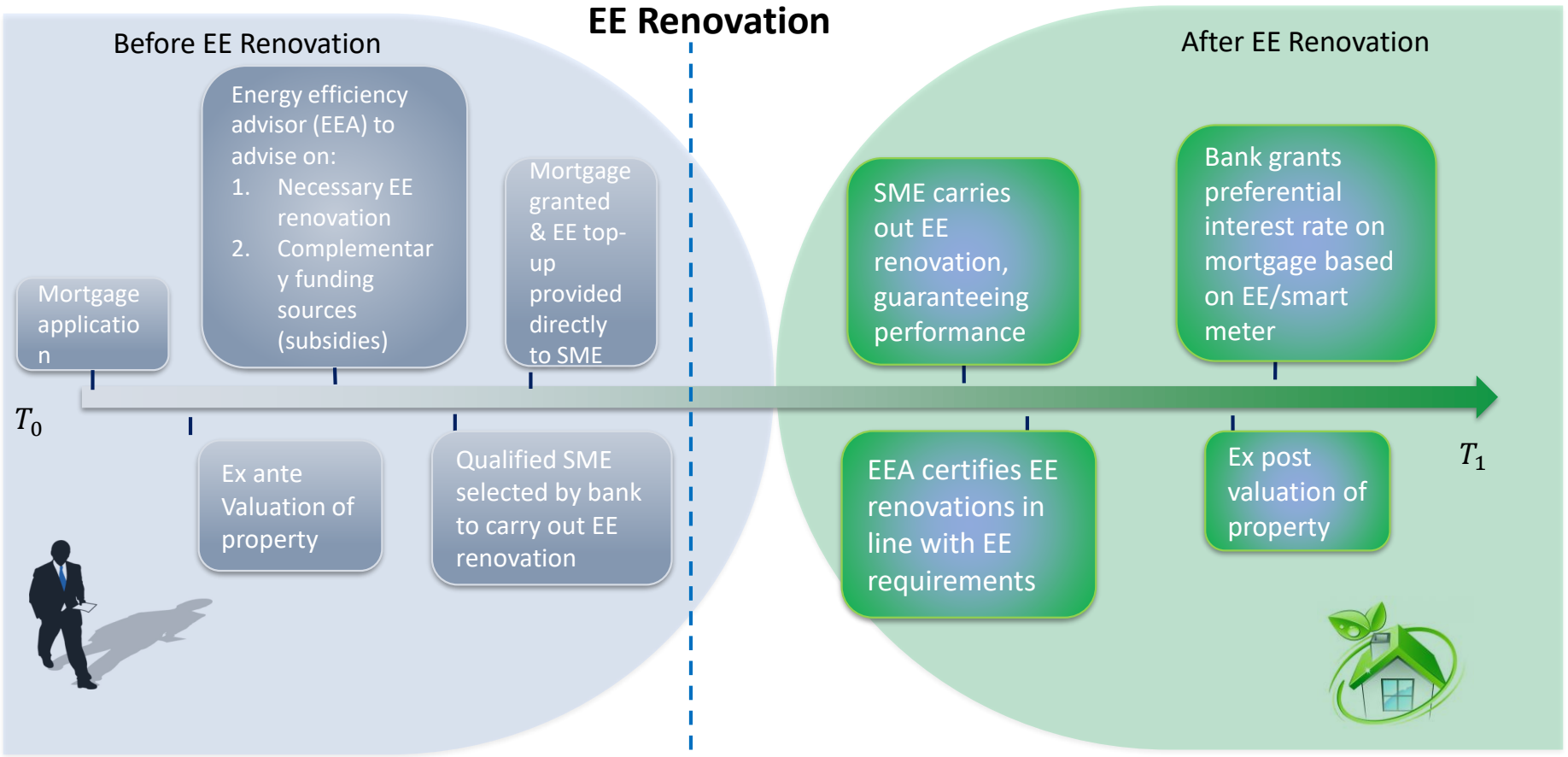
Bridging Renovation Gap - In Practice



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Incentive Chain

Borrower:
- Lower energy bills
- Energy Efficiency Behaviour
- Lower interest rate on mortgage for energy efficient property
- Free capital for retrofitting

SME/ Real Economy:
- SMEs active in the retrofitting of buildings and dwellings to become more energy efficient
- Juncker Plan

Issuer/Originator:
- Access to funding cost advantages
-Increased loss mitigation capacity
- Lower capital requirements as a result of lower PD
- Reputational benefits

Society:
- Reduction in energy consumption
- Wealth conservation
- Reduction in greenhouse gas emissions

Investor:
- Diversification of investor portfolio
- Allocation of energy efficient investment buckets
- Green added value vs brown discount

Government:
- Pan European plan to stimulate energy efficient investment in residential property
- Improvement of existing housing stock
- Compliance with 1997 Kyoto Protocol – COP21
- Access to quantitative & qualitative database on energy efficient mortgages & covered bonds

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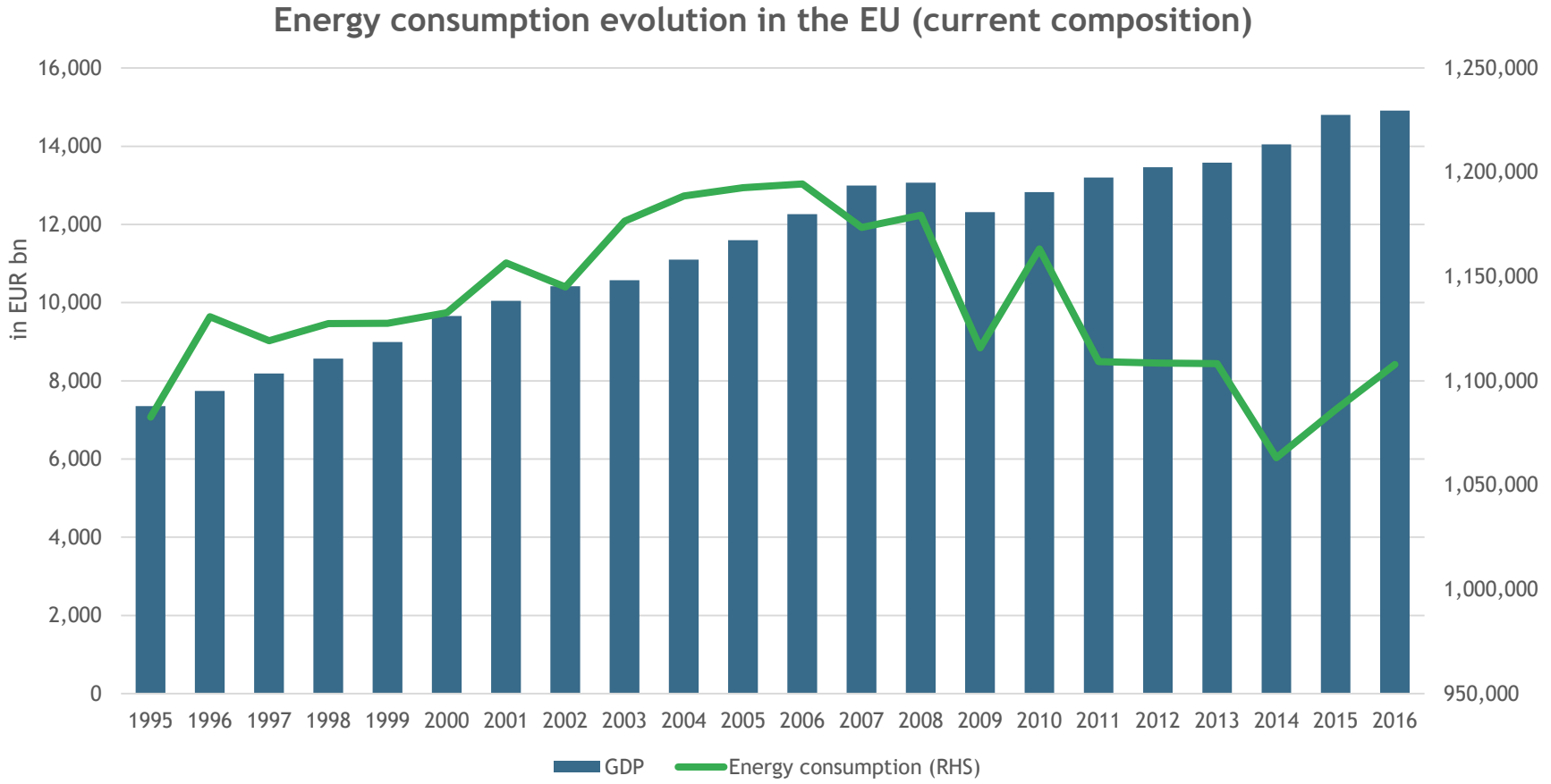
GDP and Energy Consumption



Source: Eurostat

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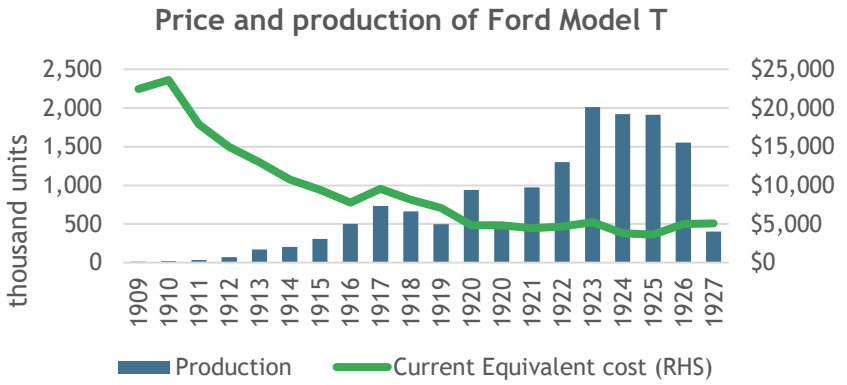
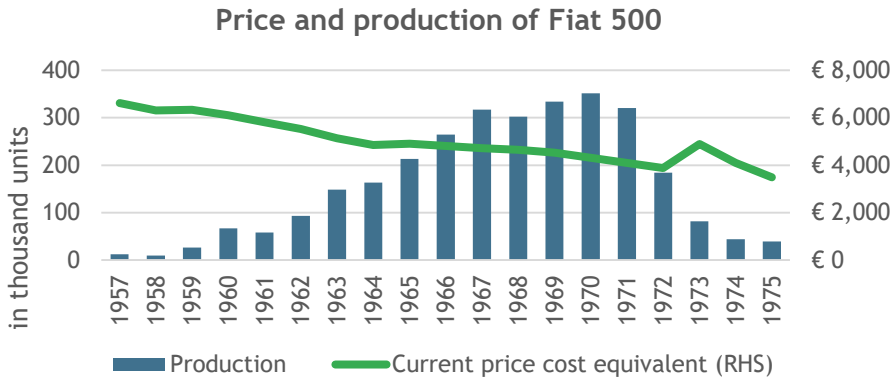
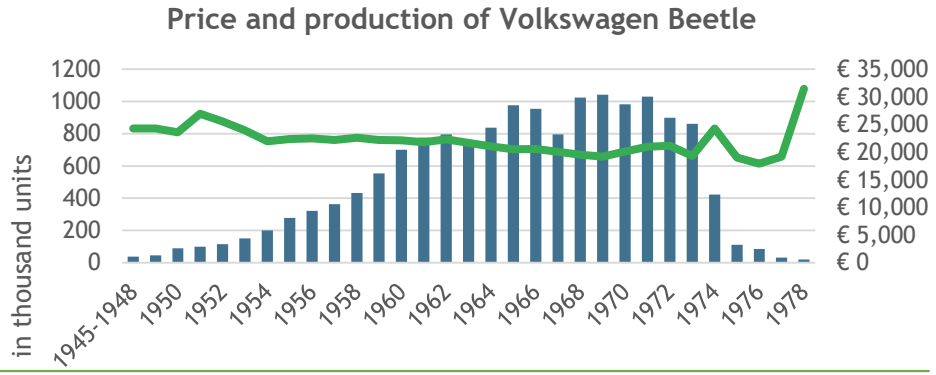
Cars that Defined an Era





Source: author's calculation, il Sole 24 Ore,

Source: Wikipedia



Source: author's calculation, Bnhof.de

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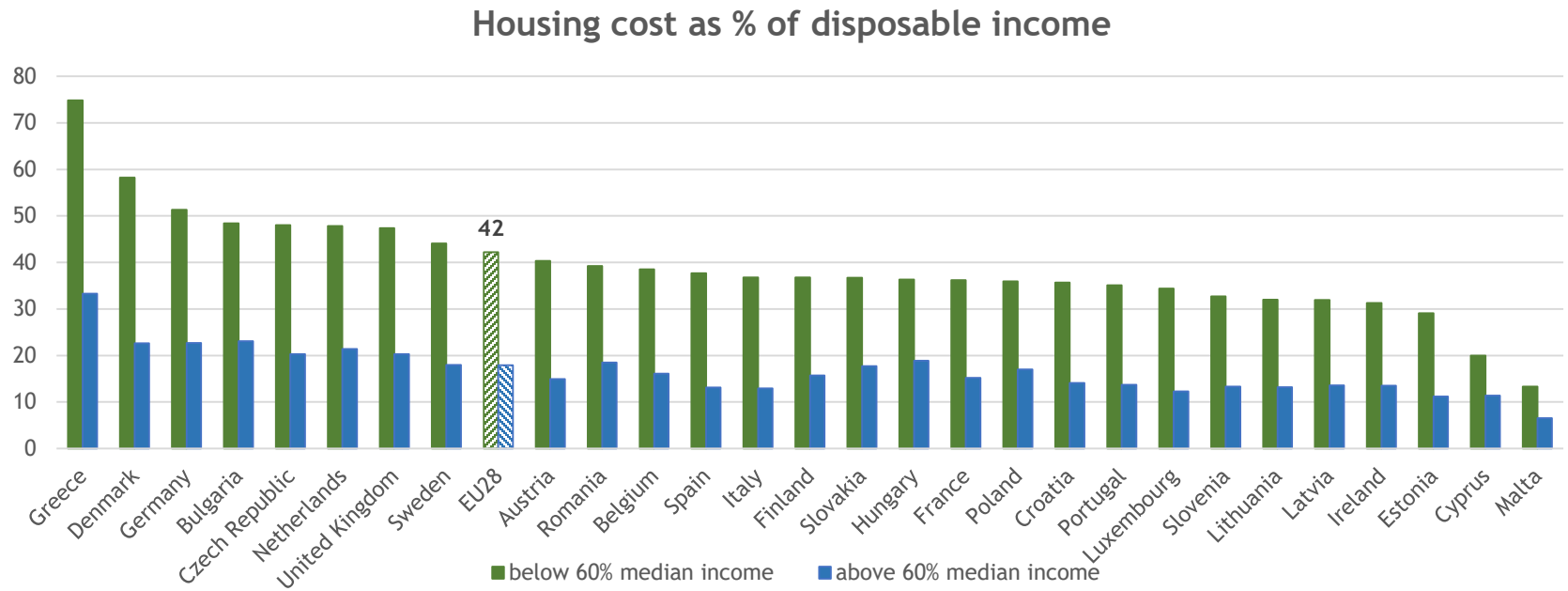
Home, 'Expensive' Home



Source: Eurostat – 2017 EU-SILC survey

Around 42% of disposable income of poorer households (below 60% of median income) is spent on housing costs

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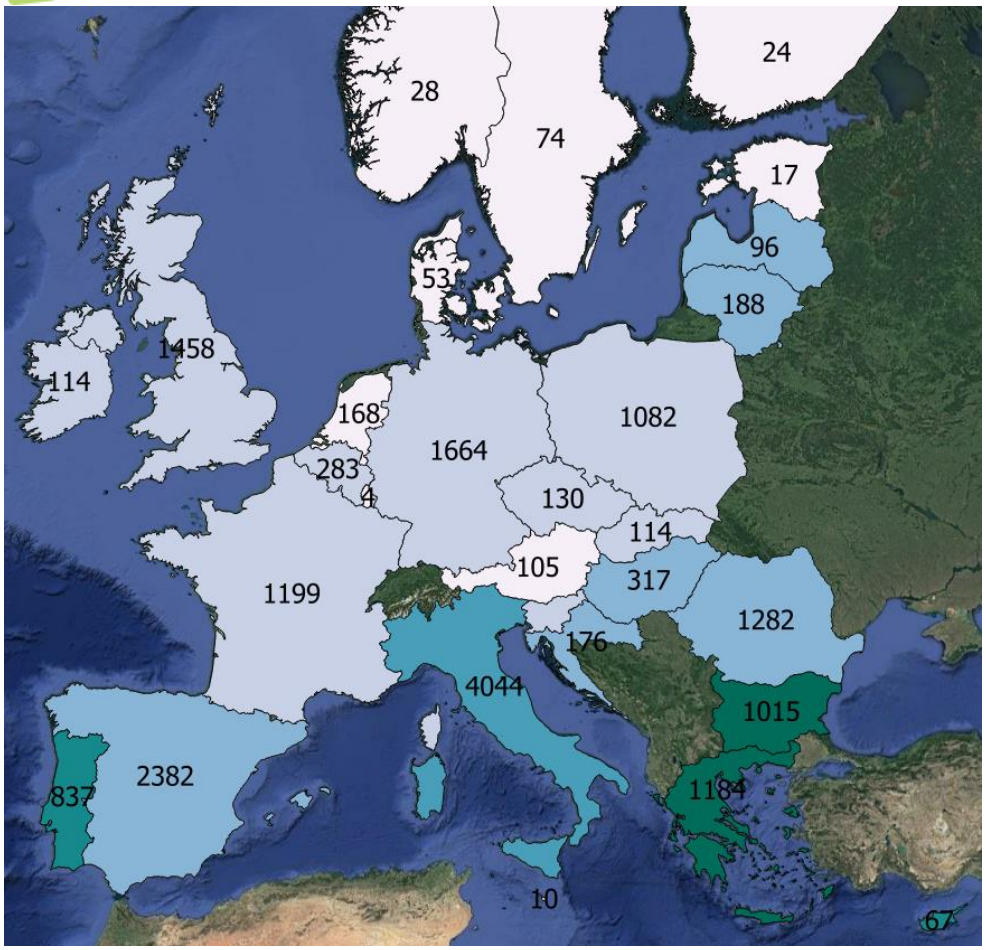
‘Heat or Eat’ Dilemma



- 21% of EU population that earn 60% or less than median income in their respective countries, over **18 million people,** live in a household which they cannot adequately heat
- This issue has different degrees of relevant according to country

Legend

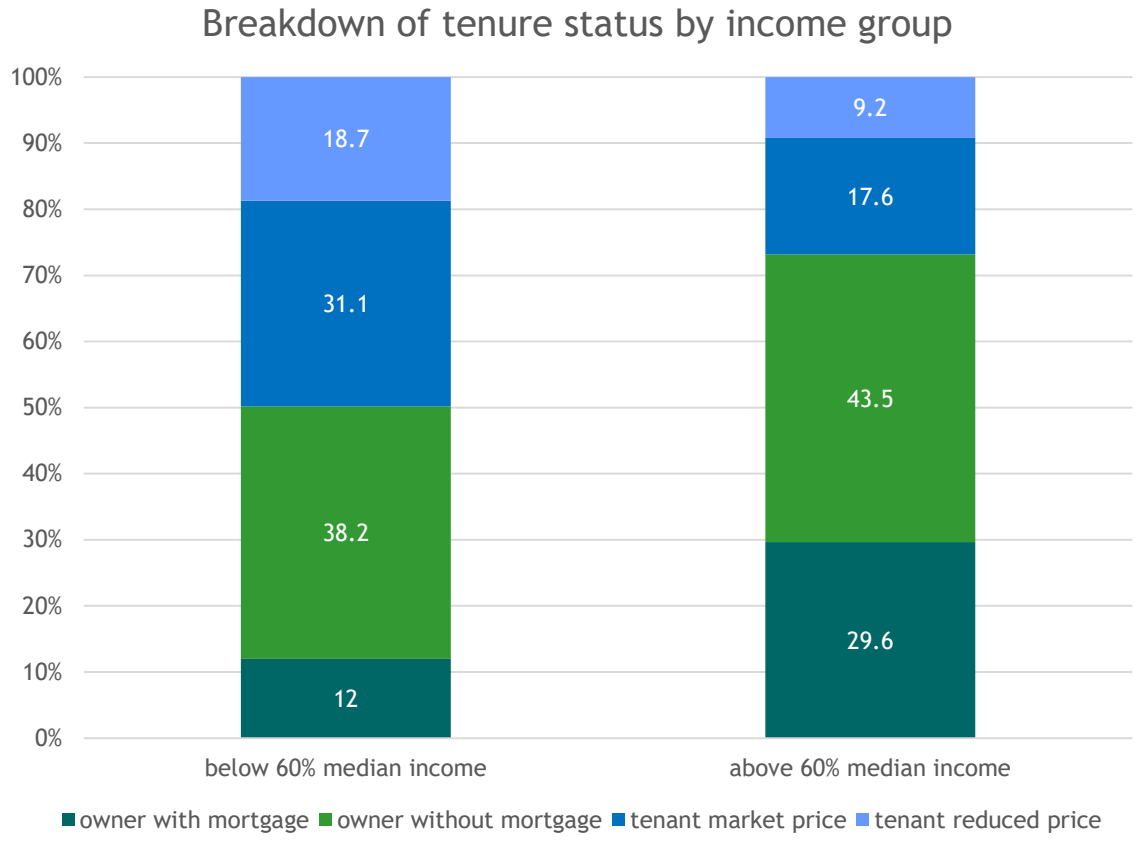
percentage of population below 60% median income unable to adequately heat their dwelling*

- 0 - 10
- 10 - 21
- 21 - 31
- 31 - 41
- 41 - 52
- 52 - 62

The label shows the number of citizen (in thousands) affected

Source: Eurostat EU-SILC survey 2017
**according to the Survey definition*

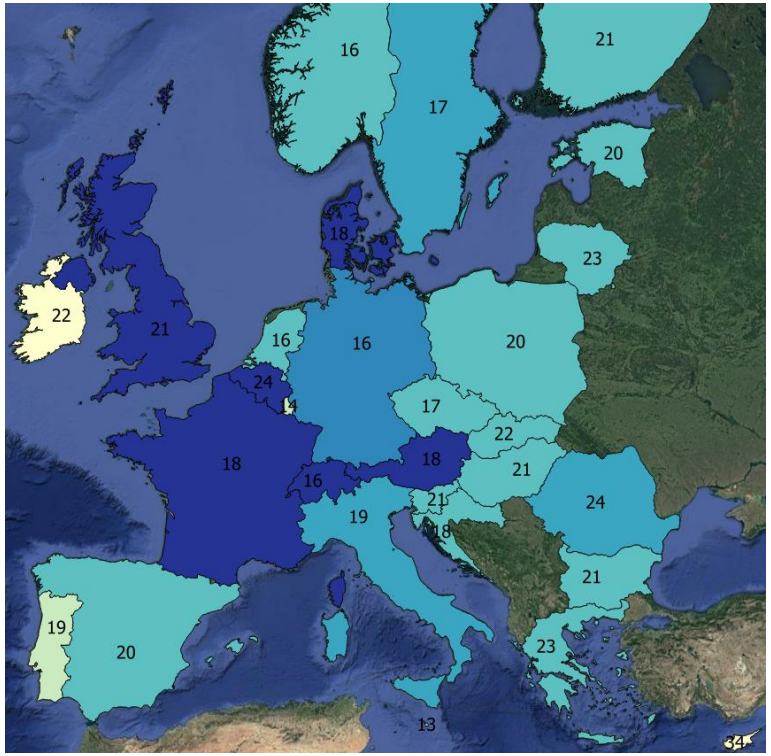
Owners or Tenants



Source: Eurostat – 2016 figures

- In EU breakdown of how citizens live is reflected by their income group
- Poorer part of population in Europe (around 86 million people earn less than 60% of their respective Member States' median income) typically live as tenants
- These individuals are also more than two times less likely to have a mortgage than the rest of the population

Houses with History

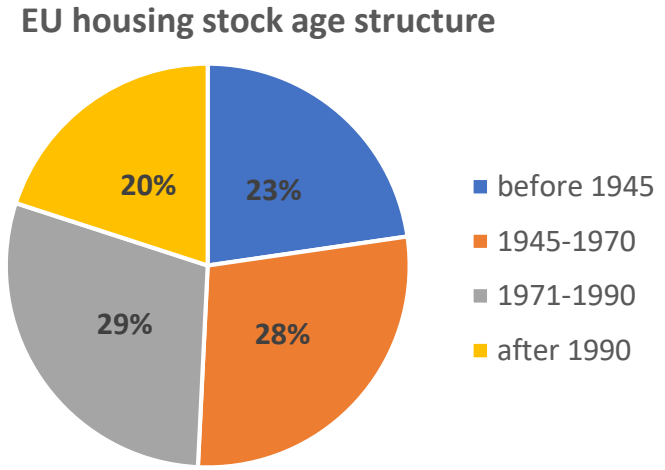


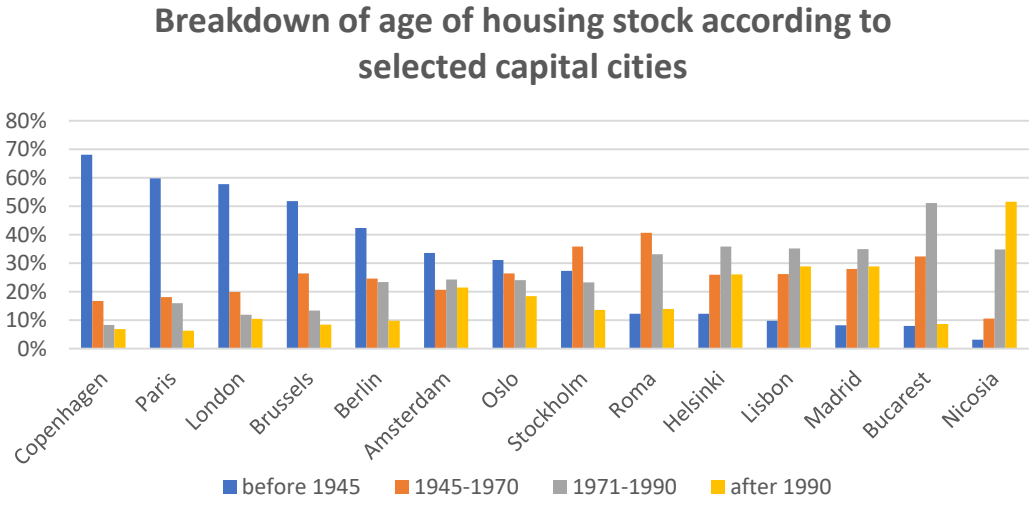
Legend

House age - most represented decade of construction

- before 1919
- 1919- 1945
- 1946 - 1960
- 1961 -1970
- 1971 - 1980
- 1981 - 1990
- 1991 - 2000
- after 2000

Label shows the percentage of dwellings built in the given period





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Pilot Scheme: To begin Solving the 'Chicken & Egg' Dilemma

Assets	Liabilities
EE mortgages • collateral	EE bonds • Covered Bonds • Securitisation

European Investment Fund (EIF)

Investor Demand

National Promoting Banks: Green Purchase Programs

European Investment Bank (EIB)

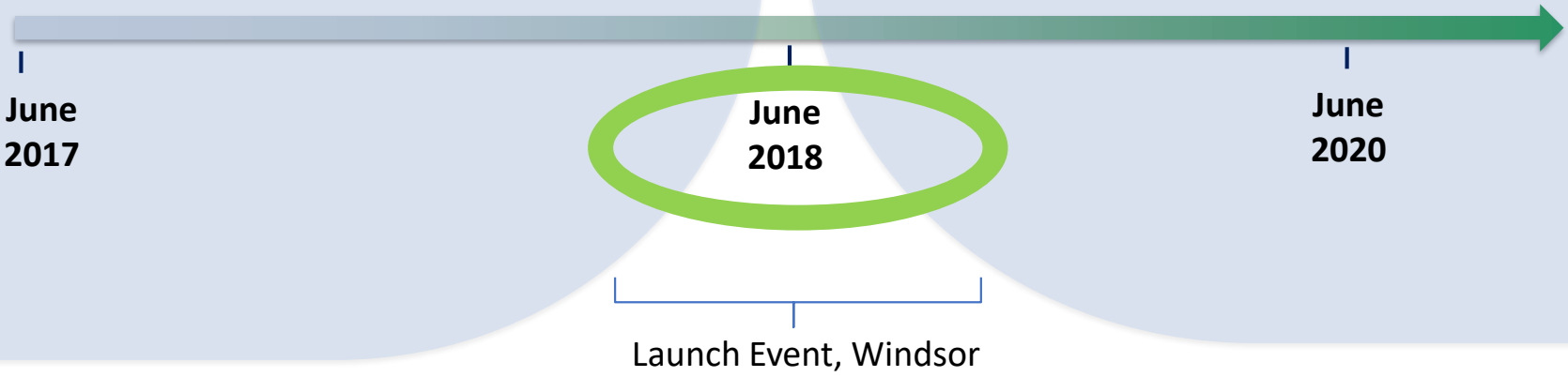
Pilot Scheme: Existing Data Analysis & Operational Test Phase

Phase 1: Framework Preparation & Analysis of Existing Data:

- Design of Product Framework and System Set-up
- Substantiation of Business Case
- Focus on Correlation between EE and LGD & PD

Phase 2: Operational Test Phase:

- Deployment of Product Framework and High-level Guidelines
- Assessment of framework Implementation
- Tag excising Mortgage Loans and begin Originating EE Mortgage Product
- Involvement of the Advisory Council
- Data collection



Energy Efficient Mortgages Initiative

List of Pilot Scheme Banks Involved (i):

- ABN AMRO (NL)
- Argenta Bank (BE)
- AXA Bank (BE)
- Banca Monte dei Paschi di Siena, BMPS (IT)
- Banco BPM (IT)
- Belfius Bank & Verzekeringen (BE)
- Berlin Hyp AG (DE)
- BNP Paribas Fortis (BE)
- BNP Paribas (UK)
- Groupe BPCE (FR)
- BPER Banca (IT)
- Caisse des Dépôts Group (FR)

Energy Efficient Mortgages Initiative

List of Pilot Scheme Banks Involved (ii):

- Caixa Geral de Depósitos, CGD (PT)
- Caja Rural de Navarra (ES)
- Compagnie de Financement Foncier (FR)
- Crédit Agricole (IT)
- Crelan (BE)
- Friulovest Banca (IT)
- Garanti Bank (RO)
- ING Belgium (BE)
- KBC Bank (BE)
- Mortgage Society of Finland, Hypo (FI)
- Münchener Hypothekenbank eG (DE)
- Norddeutsche Landesbank, NORD/LB (DE)

Energy Efficient Mortgages Initiative

List of Pilot Scheme Banks Involved (iii):

- Nordea Bank (SE)
- Nordea Eiendomskreditt (NO)
- Nordea Kredit (DK)
- Nordea Mortgage Bank (FI)
- OP Mortgage Bank (FI)
- Rabobank (NL)
- Raiffeisen Bank (RO)
- Société Générale (FR)
- Société Générale (IT)
- Triodos Bank (BE)
- Triodos Bank (ES)
- Unión de Créditos Inmobiliarios, UCI (ES)
- Volksbank Alto Adige (IT)

Energy Efficient Mortgages Initiative

Members of the Advisory Council:

- European Commission
- European Investment Bank (EIB)
- European Bank for Reconstruction and Development (EBRD)
- The World Bank
- UNEP Finance Initiative
- International Finance Corporation (IFC)

List of Supporting Organisations Involved (i):

- Alliance HQE -GBC France (FR)
- AmTrust International
- Cohispania (ES)
- Croatia Green Building Council, CGBC (HR)
- Dutch Green Building Council (NL)
- European Builders Confederation, EBC
- Finance Denmark, FIDA (DK)
- Flemish Construction Confederation, VCB (BE)
- German Sustainable Building Council, DGNB (DE)
- Green Building Council España, GBCe (ES)
- Green Building Council Finland, FIGBC (FI)
- Green Building Council Italia, GBC (IT)

List of Supporting Organisations Involved (ii):

- Irish Green Building Council, IGBC (IE)
- Madrid City Council (ES)
- Polish Green Building Council, PLGBC (PL)
- Romania Green Building Council, RoGBC (RO)
- Romanian Association of Banks, ARB (RO)
- S&P Global Ratings
- Tinsa Group (ES)
- UK Green Building Council, UKGBC (UK)
- UK Regulated Covered Bond Council, UK RCBC (UK)
- Union Professionnelle du Crédit/Febelfin (BE)
- Verband deutscher Pfandbriefbanken, vdp (DE)

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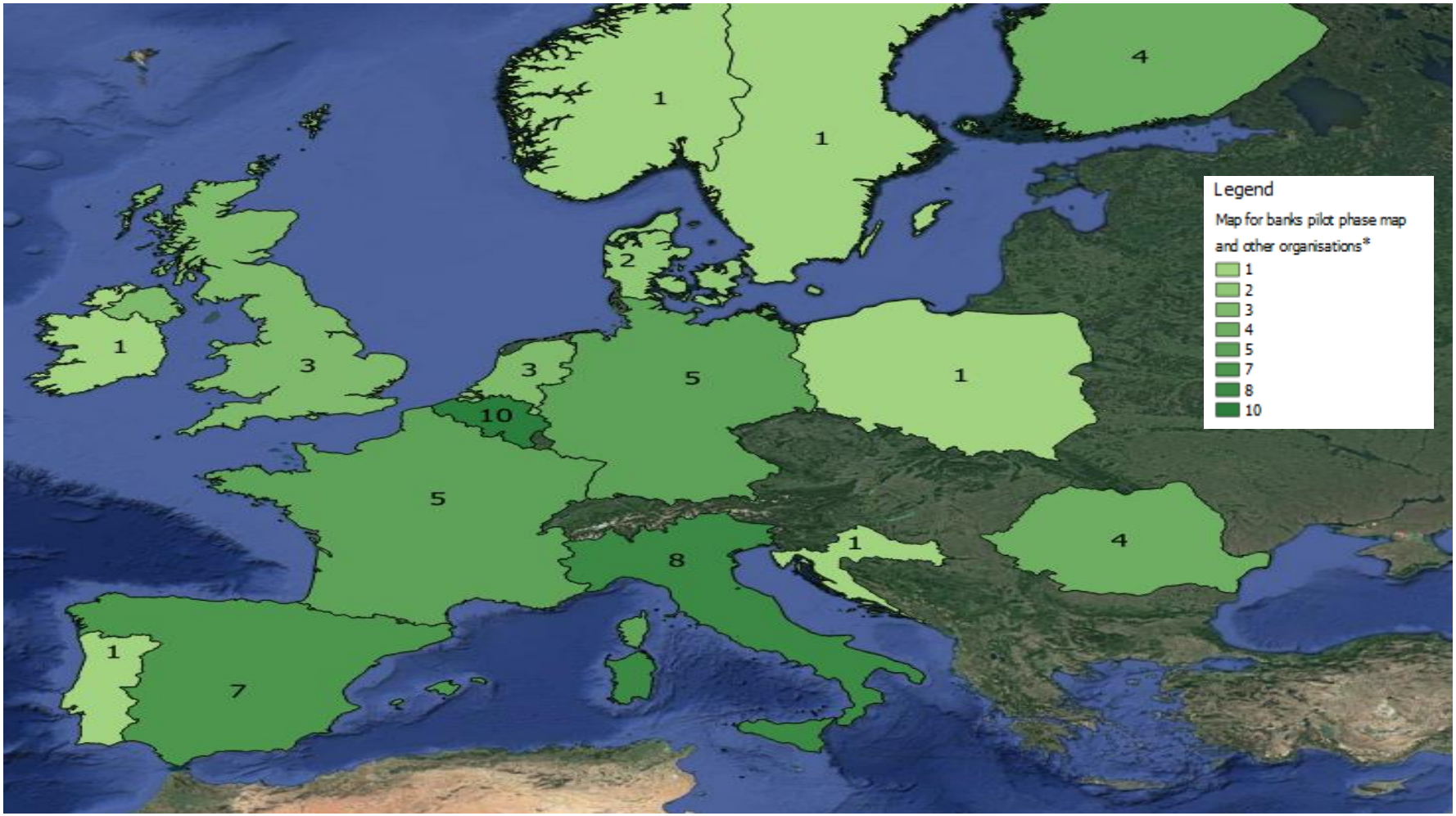
60 confirmed participants (37 banks and 23 other organisations)



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Pilot Scheme: Banks Coverage

- This map displays latest state of commitments made by 37 banks across the EU to Pilot Scheme.
- In total these banks represented EUR 3,106 billion (44,5%) in total outstanding mortgage loans.

Country	Total Numb	Only Banks	Total Outstanding Mortgage Market*	Mortgage Loan Portfolio of Participants**	Coverage in %
BE	10	8	217,126	217,126	100.00
DE	5	3	1,326,901	1,326,901	100.00
DK	2	1	243,586	243,586	100.00
ES	7	3	544,499	42,949	7.89
FI	4	3	94,056	42,380	45.06
FR	5	4	997,807	412,900	41.38
HR	1	0			
IE	1	0			
IT	8	7	368,169	177,254	48.14
NL	3	2	664,416	470,300	70.78
NO	1	1	274,257	25,800	9.41
PL	1	0			
PT	1	1	95,377	28,400	29.78
RO	4	2	12,893	12,893	100.00
SE	1	1	386,504	42,500	11.00
UK	3	1	1,544,729	89,509	5.79
EU/intern	0	0			
Total EEA			**7,267,648**	**3,132,497**	**43.10**
Total EU			**6,981,540**	**3,106,697**	**44.50**
Total euro area			**4,635,620**	**2,692,410**	**58.08**

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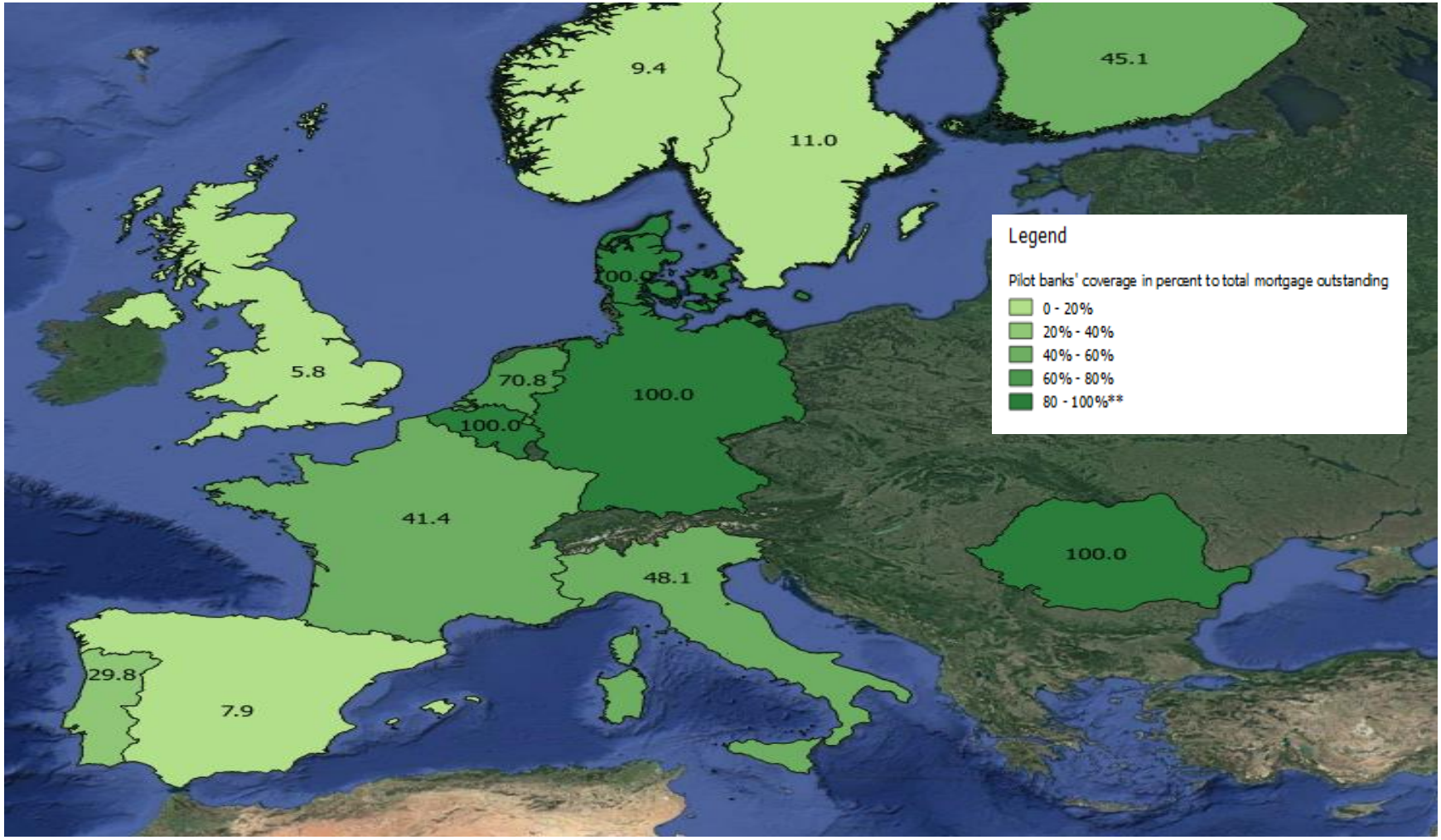
Coverage of pilot banks to total mortgage outstanding in 2017 *



Pilot Scheme: Product Framework & Guidelines

The **Energy Efficiency Mortgage Pilot Scheme Product Framework**, which should be considered in order to ensure successful implementation of an Energy Efficient Mortgage product within banks' existing internal procedures, consist of the following sets of high-level guidelines:

I. Implementation Guidelines for Banks
II. Building Performance Assessment Guidelines
III. Valuation Guidelines: Energy Efficiency Checklist

The final Product Framework has incorporated feedback received from the market consultation, series of national roundtables and interviews conducted since the publication of the draft Product Framework in February 2018.

The Pilot Scheme will test the Product Framework in an operational environment and feedback received from participants will feedback back into the guidelines with a view to reviewing and adjusting the Framework over time as appropriate to respond to the market.

Energy Efficient Mortgages Initiative

From a Valuation Perspective:

EPC^0

EPC^1 + list of EE improvements

Smart meter

$Value^0$

$Value^1$

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Pilot Scheme: Looking for Market Solutions

Identification of Critical Areas

Pilot Scheme: Market Think-Thank

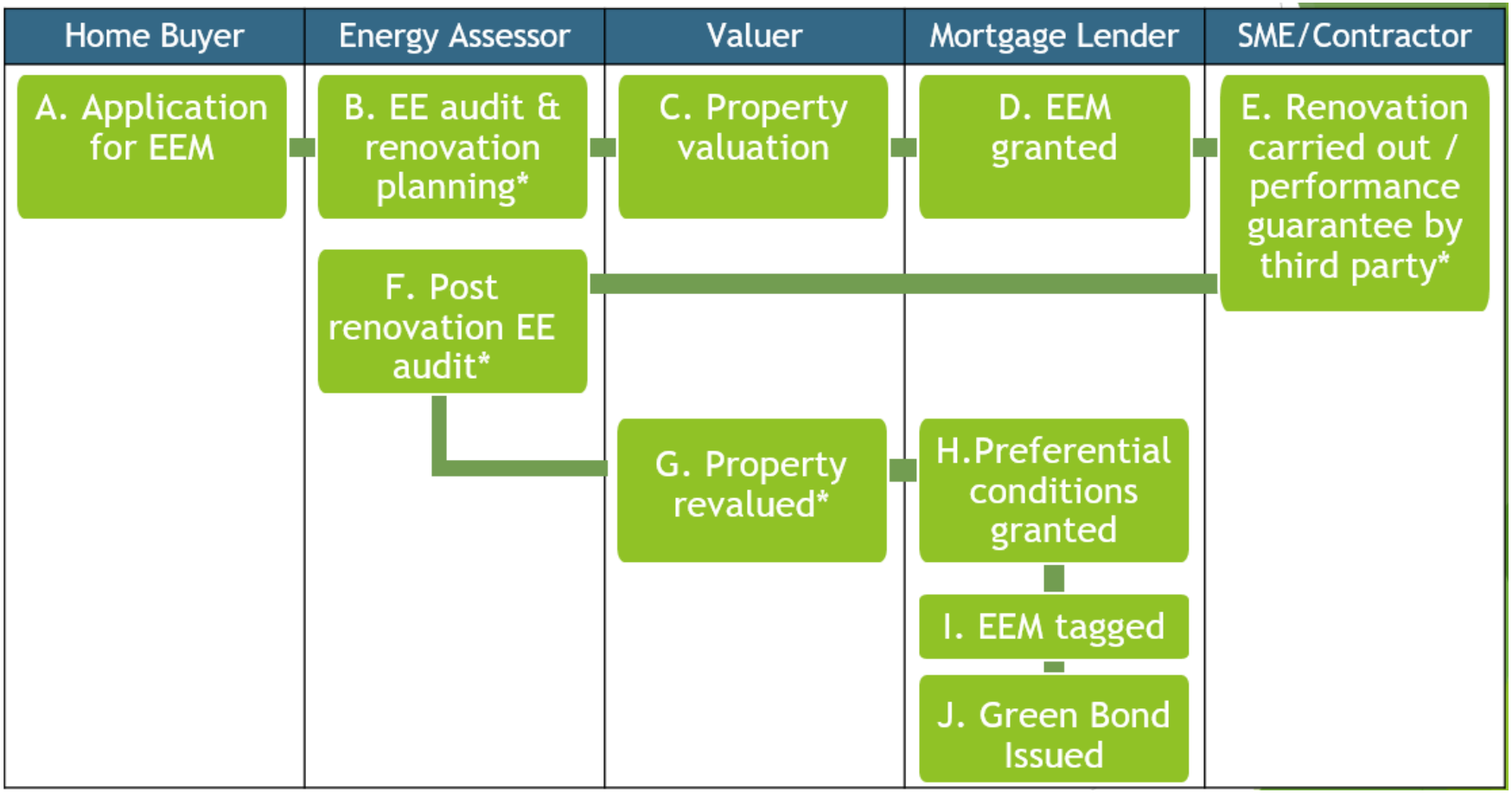
- Facilitation of simplified EEM asset value chain *(i.e. previous slides)*
- How to incorporate and maximise the EPC standard
- Certification/guarantee of EE improvements *(i.e. previous slides)*
- How best to link and capture dynamic datasets
- Commercial partnership between banks and utility providers

- Areas to be examined:
  - Origination
  - Marketing
  - Funding
  - Investor relations
  - Partnerships (development of synergies with other stakeholders)
  - IT Solutions - data
  - Development of technical expertise (SMEs, Valuers, Energy Efficiency experts)

All areas to be further studied by **Subgroups** of Pilot Scheme participants in advance of the Pilot Scheme Meeting – 26 & 27 September, Venice

Energy Efficient Mortgages Initiative

The Energy Efficient Mortgage Process



Covered Bond Label: Sustainable Covered Bonds

Sustainable Covered Bond ○ No ◉ Yes ○ All

Search ▸

ISIN	Issuer	Initial Date of Issuance	Maturity Date	Face value[1]	Coupon	Syn.	Listed	Tapped	Mat.[2]	EEA[3]	LCR[4]
ES0415306069	Caja Rural de Navarra, Cr...	08/05/2018	08/05/2025	EUR 500,000,000	Fixed	Yes	Yes	No	HB	Yes	1
XS1760129608	SpareBank 1 Boligkreditt	30/01/2018	30/01/2025	EUR1,000,000,000	Fixed	Yes	Yes	No	SB	Yes	1
DE000BHY0GH2	Berlin Hyp AG	14/06/2017	23/10/2023	EUR 500,000,000	Fixed	Yes	Yes	No	HB	Yes	1
ES0415306051	Caja Rural de Navarra, Cr...	01/12/2016	01/12/2023	EUR 500,000,000	Fixed	Yes	Yes	No	HB	Yes	1
ES0443307063	Kutxabank S.A.	22/09/2015	22/09/2025	EUR1,000,000,000	Fixed	Yes	Yes	No	HB	Yes	1
DE000BHY0GP5	Berlin Hyp AG	05/05/2015	05/05/2022	EUR 500,000,000	Fixed	Yes	Yes	No	HB	Yes	1
DE000MHB10S4	Münchener Hypothekenbank ...	24/09/2014	24/09/2019	EUR 300,000,000	Fixed	No	Yes	No	HB	Yes	2A

The Labelled Sustainable Covered Bond Definition:

Sustainable covered bond. A Covered Bond Labelled sustainable covered bond is a covered bond that is fully compliant with the Covered Bond Label Convention, and also includes a formal commitment by the issuer to use an amount equivalent to the proceeds of that same covered bond to (re)finance loans in clearly defined environmental (green), social or a combination of environmental and social (sustainable) criteria. Covered Bond Labelled sustainable covered bond programs are based on their issuer's sustainable bond framework which has been verified by an independent external assessment. The issuer strives, on a best efforts basis, to replace eligible assets that have matured or are redeemed before the maturity of the bond by other eligible assets. [Against this background, please note that the EMF-ECBC is currently working on market initiatives which will ultimately define European criteria for energy efficiency covered bonds and sustainability standards]

Pilot Scheme: Next Meeting

Energy Efficient Mortgages Pilot Scheme Meeting – Venice, 26-27 September 2018 *(information available on the website)*

Energy Efficient Mortgages Initiative

UK Government

Julian Critchlow,
Director General,
Department for Business,
Energy & Industrial Strategy,
UK Government

Energy Efficient Mortgages Initiative

European Commission

Gerassimos Thomas,
Deputy Director-General for Energy

Energy Efficient Mortgages Initiative

Energy Efficient Mortgages: Energy Company & Consumer Perspective

Michael Lewis,
CEO at E.ON UK

Energy Efficient Mortgages Initiative

Energy Efficient Mortgages: Energy Company & Consumer Perspective

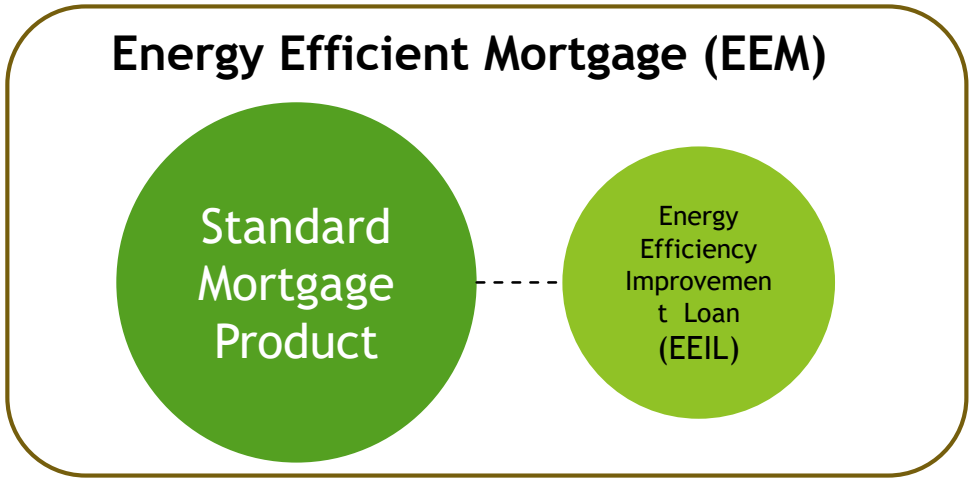
Marco Marijewycz,
International Market Manager,
E.ON Solutions GmbH

Energy Efficient Mortgages Initiative Consumer Research Insights

Marco Marijewycz
International Market Manager, E.ON
EeMAP Consortium Member

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 746205

What Energy Efficient Mortgage concept did we test with consumers?



- Packaged mortgage product made up of two linked loans
- EEM product carries an interest rate discount
- EEIL is a low cost loan facility linked to mortgage
- EEIL funds upgrades determined by energy audit

Home-buyer benefits:

- Increased comfort
- Reduced borrowing costs
- Deliver lower energy bills

Lender benefits:

- Reduces risks/probability of default
- Protects against asset value erosion
- Creates collateral for Green Bonds

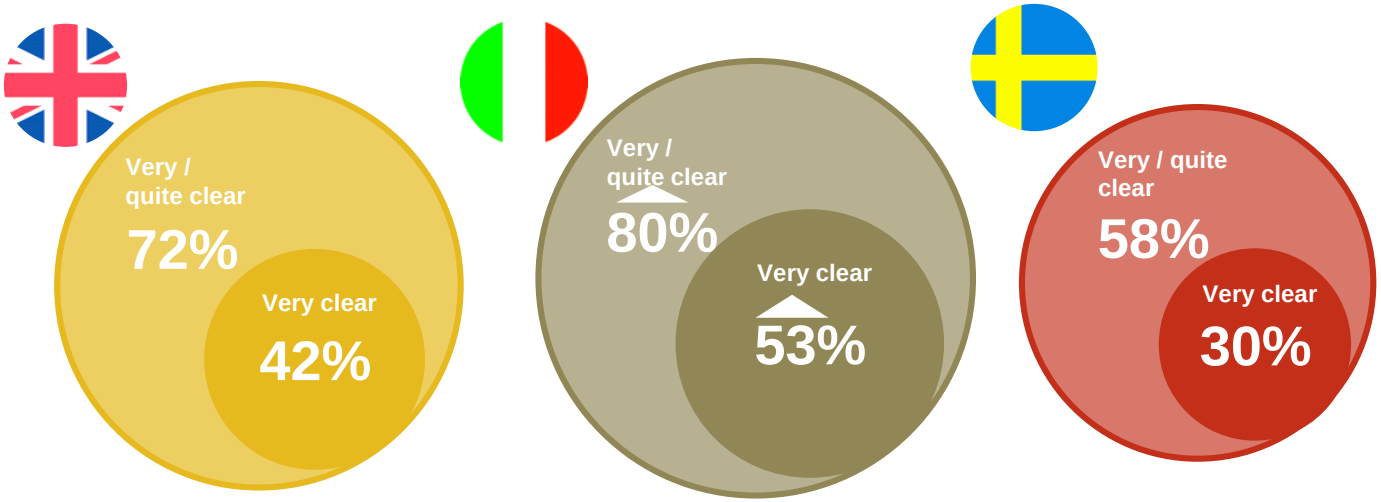
Across each market, we asked a series of questions to unpick reaction to the proposition

Is it understood?	Is it relevant?	How appealing is it?	Is there an appetite to take out a Energy Efficient Mortgage?

We're able to isolate key consumer groups across each metric, to understand who may be the initial target market for the Energy Efficient Mortgage (EEM)

The majority of consumers in all markets feel they are clear how the Energy Efficient Mortgage works…

Claimed understanding of EEM proposition
All respondents



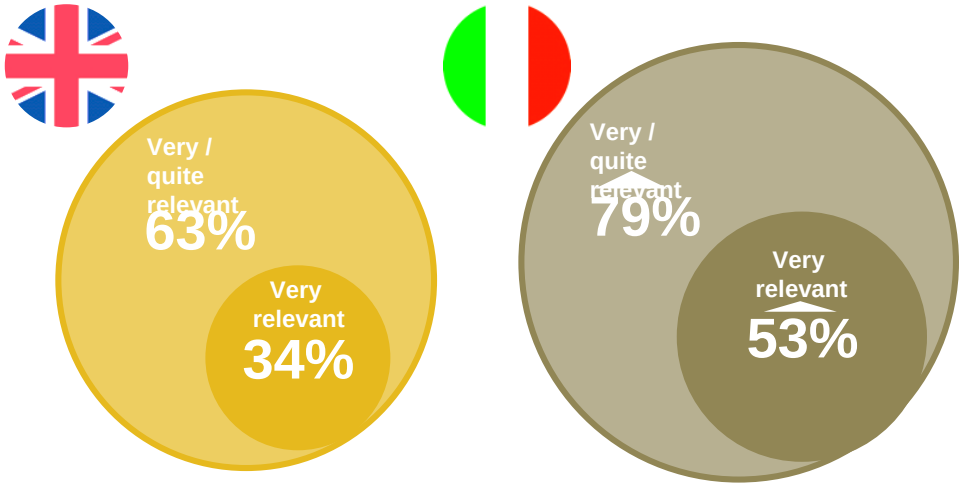
* Unclear in each market 7% of less

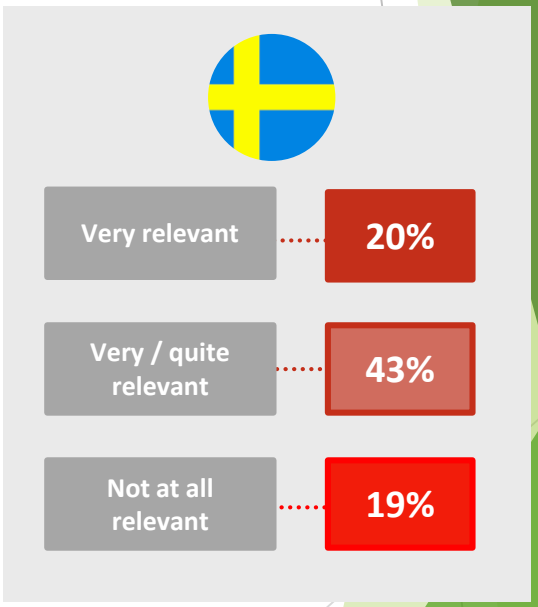
B3. How clear are you on how this new mortgage product works?
Base: UK (525), Italy (516), Sweden (543)

BASIS

… and Italian's feel it is most relevant, as some consumers in Sweden struggle to believe it could be of interest to them

Claimed relevance of EEM proposition
All respondents





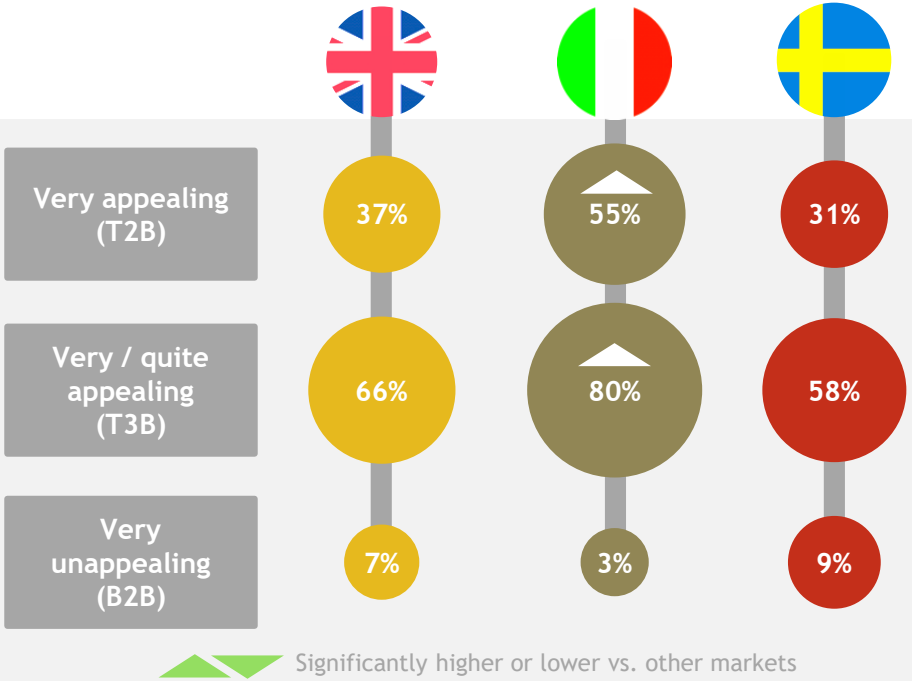
* Not at all relevant UK = 10%, Italy = 3%

B2. How relevant is this new mortgage product to you?
Base: UK (525), Italy (516), Sweden (543)

BASIS

The Energy Efficient Mortgage holds greatest appeal to the Italian market, and outright rejection of the proposition is minimal…

Appeal of EEM proposition
All respondents



Significantly higher or lower vs. other markets

"This would be brilliant - we've been wanting to do something like this for years… there's no downside - 10/10"

Sweden

"I like the idea of improving energy efficiency and I think that in the long run I'll save money"

Italy

"I like trying to be green and love idea of being rewarded for it"

UK

"An excellent opportunity for energy improvement in my home, helping not only me, but the environment"

Italy

B1. Thinking broadly about the new mortgage product you have seen, how appealing do you find it?
Base: UK (525), Italy (516), Sweden (543)

BASIS

The Green Mortgage's financial advantages drive its appeal - access to a 'lower interest rate' is key in UK and Sweden, while 'saving in the long term' is important in Italy

Appeal of Key Features - Most appealing

Top 3



	UK	Italy	Sweden
Lower interest rate on my…	19%	12%	18%
Would bring down energy bills	16%	13%	16%
Save money in the long term	16%	17%	13%
Increase property value	14%	15%	14%
Warmer, more comfortable home	11%	11%	8%
A competitive loan to make home…	7%	13%	9%
Reduce my carbon footprint	7%	11%	9%
Easier to sell my property	6%	6%	4%

B7, How appealing do you find each of the following aspects of the Green Mortgage, along with the Energy Efficiency Improvement Loan? First choice

Those who do not find the Energy Efficient Mortgage appealing are already planning on buying an energy efficient property, or do not want to take out an additional loan

Barriers
All who do not find the EEM appealing

Most important reason
(select 1 only)



Primary barriers

Do not want to take out / cannot afford an additional loan	18%	25%	23%
I already have an energy efficient home, therefore it is not applicable to me	18%	11%	15%

B10A. BARRIERS: Which of the following reasons best describe why you do not find this product appealing? UK=62, IT=35, SW=96

Length of time for the work and a predicted short tenure are secondary barriers, alongside a worry about 'being tied in' to a certain mortgage

Barriers
All who do not find the EEM appealing

Most important reason
(select 1 only)



Secondary barriers

Don't have time for home renovation / too much of a hassle	10%	6%	7%
I don't see myself in my home long enough to benefit	3%	11%	7%
Worry this would tie me in to a mortgage provider for a long time	8%	6%	4%
I am not interested in making my home more energy efficient	8%	3%	6%

All other barriers under 6%

B10A. BARRIERS: Which of the following reasons best describe why you do not find this product appealing? UK=62, IT=35, SW=96

We also tested with respondents the value of a ‘managed energy efficient renovation’ service

Appeal of Installation options A & B
All who find Green Mortgage appealing

A A managed service using a lender’s preferred partner(s)

B A DIY/self-managed refurbishment project

	UK	IT	SW
NET appealing	72%	75%	54%
NET unappealing	11%	9%	14%

	UK	IT	SW
NET appealing	62% ▼	74%	45% ▼
NET unappealing	20% ▲	9%	29% ▲

▲▼ Significantly higher or lower vs. option A

E1. How appealing do you find the below installation option? All who find Green Mortgage appealing UK=462, IT=481, SW=447
T3B / B3B

BASIS

Across all markets, keeping costs in check and ensuring the quality of the works are key factors when considering both installation options

Why do you find it appealing?
All who find installation option appealing

Top 3 reasons

A

- ✓ The cost of the installation is guaranteed
- ✓ The quality of the installation is guaranteed
  Because the installer is recommended
- ✓ Do not have the hassle of managing the installation

B

- ✓ I have control over the cost of the installation
- ✓ I can guarantee the quality of the installation Because I pick the installer myself
- ✓ I have control and flexibility

Reasons are mirrored across the two options

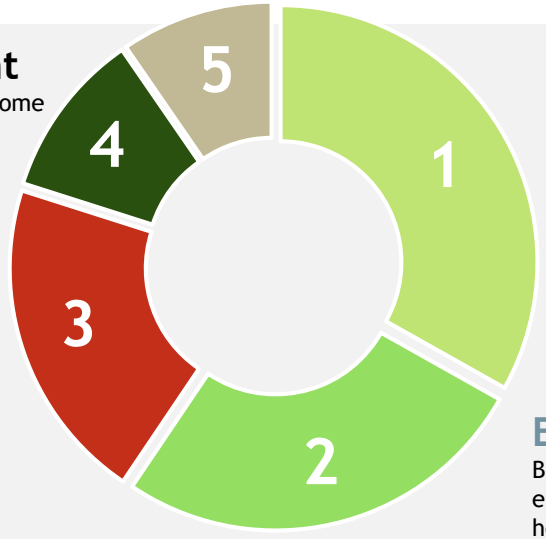
E2. SUMMARY: Which of the following best describe why you find it appealing?

The Energy Efficient Mortgage's financial advantages drive its appeal, with aspects related to energy and property also important drivers

What is driving appeal?
All who find EEM appealing

Most attractive aspect
(select 1 only)

Consistent across markets



Finance
Getting a lower interest rate on your mortgage, and saving money in the long term

Energy
Bringing down the cost of your energy bills, and making your home more warm and comfortable

Property
Increasing the value of your property, and making it easier to sell

Home improvement
Getting a competitive loan for home improvement purposes

Green
Reducing your carbon footprint

B7. How appealing do you find each of the following aspects of the Green Mortgage, along with the Energy Efficiency Improvement Loan?

How should the Energy Efficient Mortgage proposition be communicated to maximise impact?

1st

Convey the financial gains

Talk about interest rate discount

Emphasise “long term financial gains”

2nd

Communicate the benefits to be gained from an energy efficient home

Cheaper energy bills

Warmer, more comfortable home

The Energy Efficient Mortgage is recognised as providing an array of different benefits – also talk about increasing property value, a loan for home improvement and reducing carbon foot print

Download the final Consumer Research report from the Energy Efficient Mortgage Initiative Website

http://eemap.energyefficientmortgages.eu/wp-content/uploads/2018/04/EeMAP_D2.7_E.ON_Final.pdf

Energy Efficient Mortgages Initiative

Social Impact of Energy Efficient Mortgages - profiling energy risk in Denmark

Kåre Christensen,
Finance Denmark

Energy Efficient Mortgages Initiative

Putting energy efficiency into a financial context

Families are financially susceptible to changes in costs of living

- Interest rates
- Taxes
- Energy costs

- Energy cost =

- Energy price *
- Energy consumpiton (energy efficiency)

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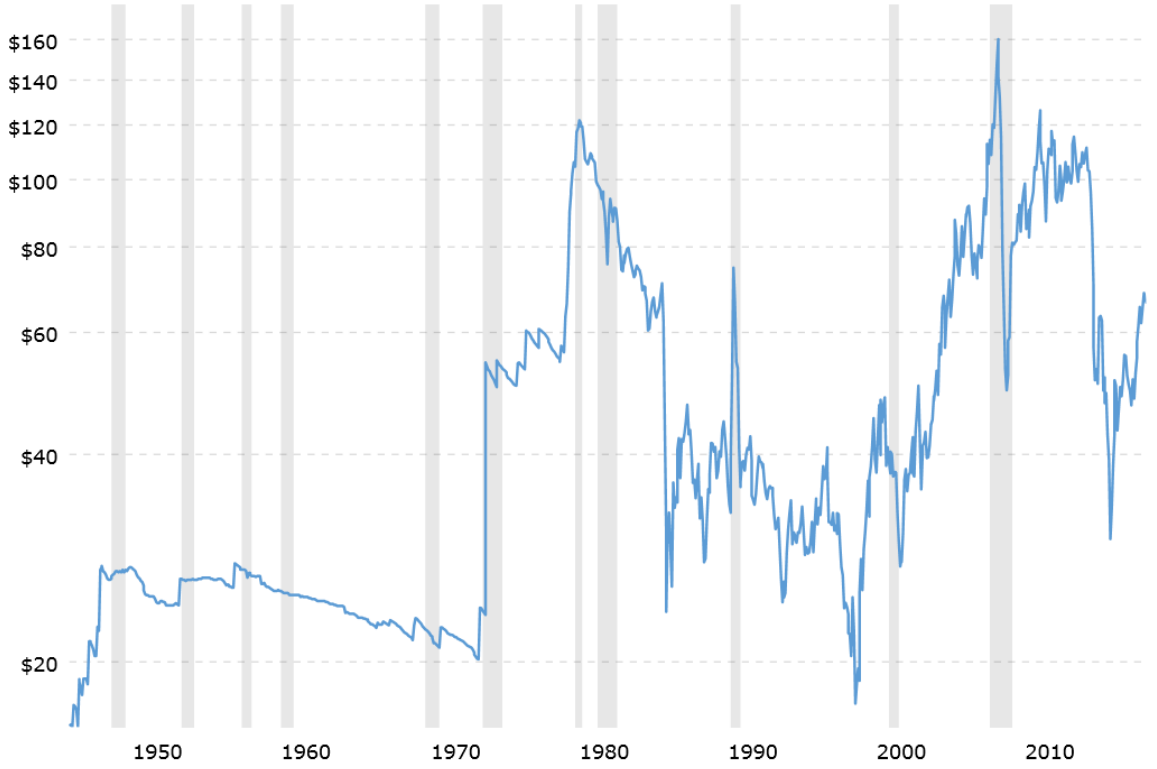
Energy prices can be volatile

Crude oil, $ per barrel



Source: Macrotrends

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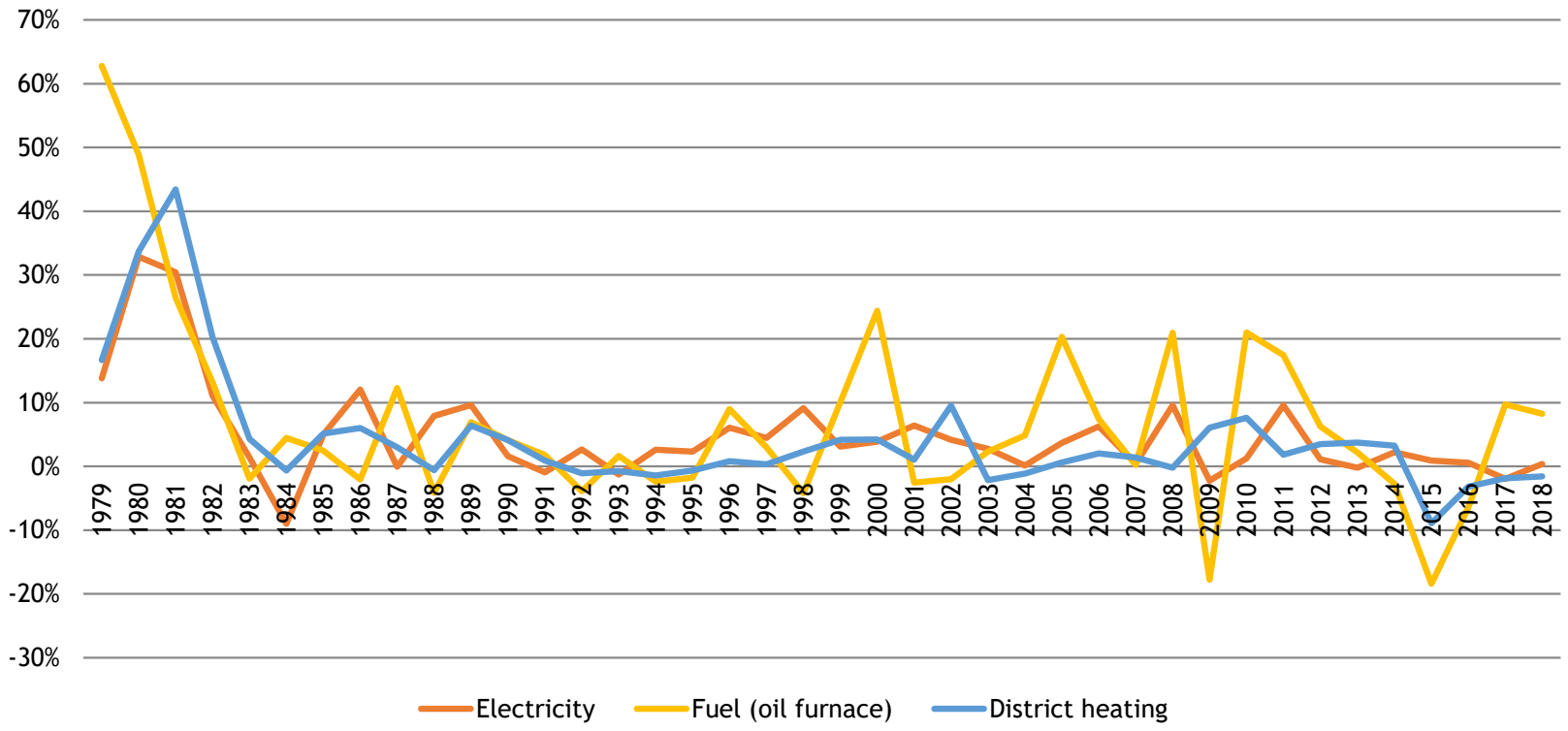
Less pronounced at the consumer level

Energy costs to Danish consumers, % Y/Y

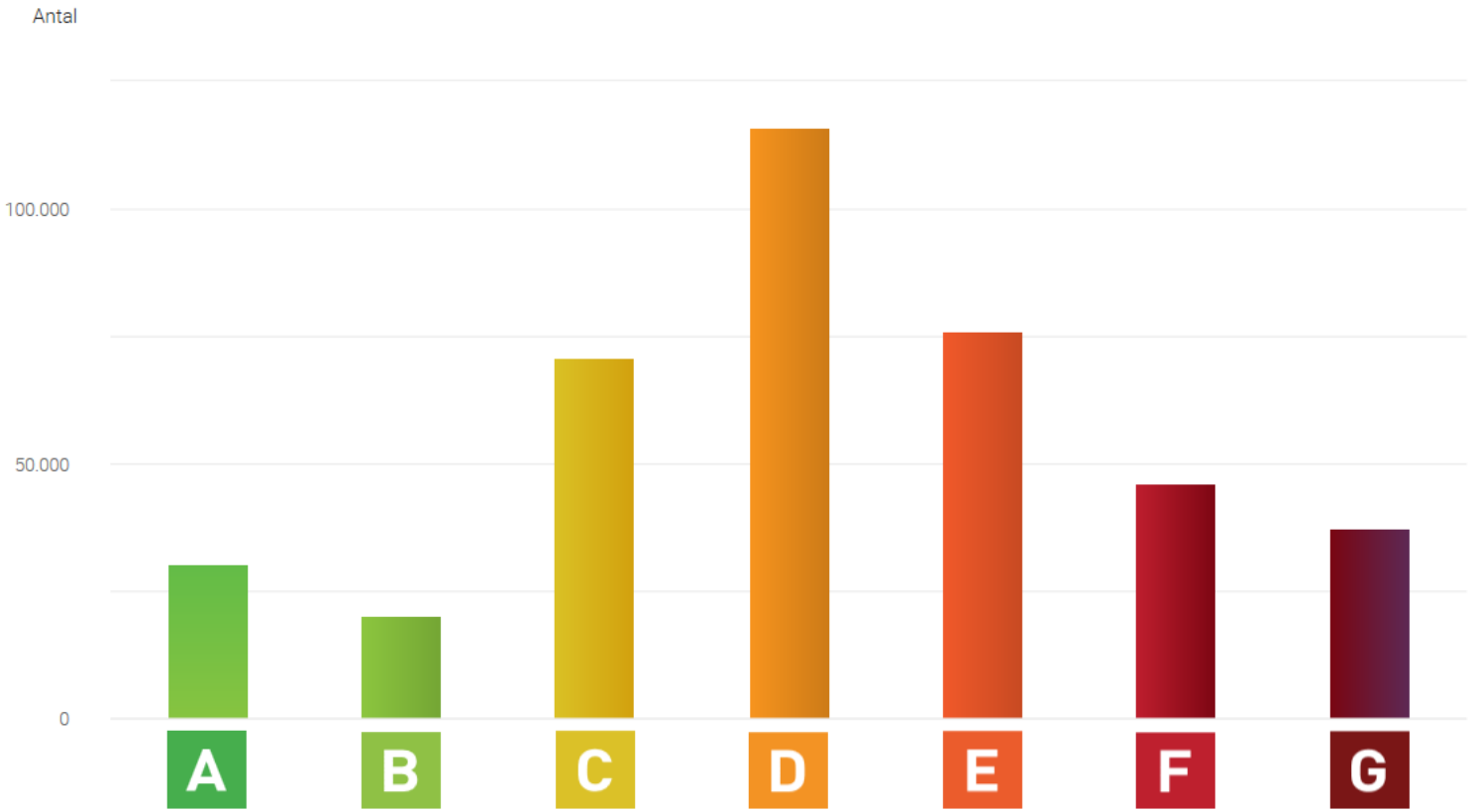


Energy efficiency in Danish dwellings

Characteristics of Danish energy labels

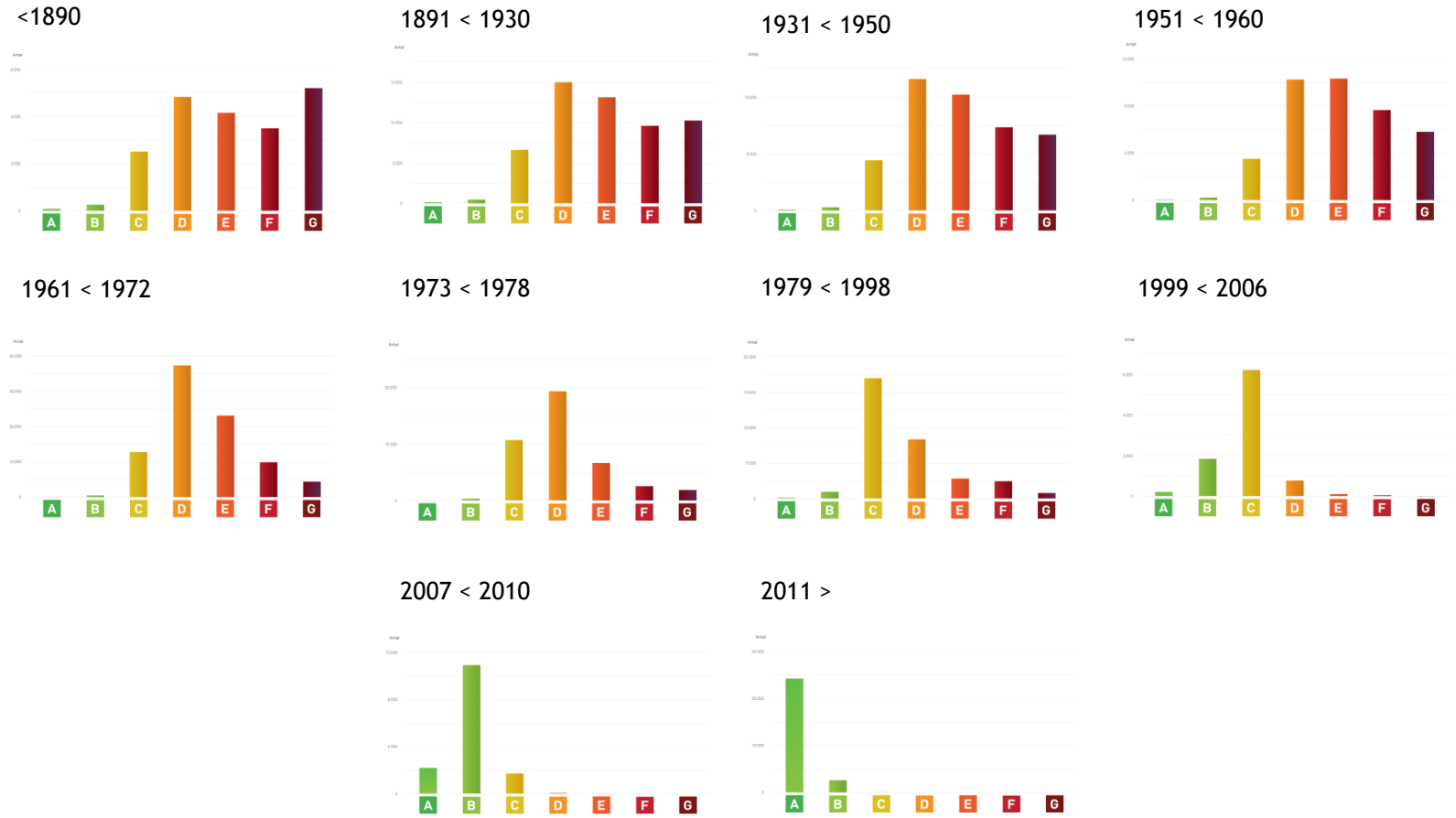
- Most common label is D
- Building year matters
- Geography matters

Energy labels in Denmark, single family homes



Source: Energistyrelsen

Building year matters



Source: Energistyrelsen

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Potential impact of stressing energy costs

Calculating the impact of energy costs in a user cost model with geographical distribution

- Assuming an average house with an energy label **D** (district heating)

- Assuming an new build energy efficient house with an energy label **A** (district heating)

- Assuming a low energy efficient house with an energy label **G** (oil furnace)

- Assuming average energy consumption proportional to energy label

Energy efficiency and heating source matters to energy costs and risks

Energy label	Area (m2)	Energy consumption per m2 (kWh)	Yearly consumption (kWh)	Yearly heating costs (euro)
A2020	140	20	2 800	263
A2015	140	37	5 200	489
A2010	140	64	9 000	846
B	140	86	12 000	1 128
C	140	133	18 600	1 748
D	140	180	25 200	2 368
E	140	227	31 800	2 988
F	140	286	40 100	3 768
G	140	286	40 100	3 768

Source: Energitilsynet and own calculations
Note: It is assumed that the house is heated through district heating at the cost of DKK 700 / MWh

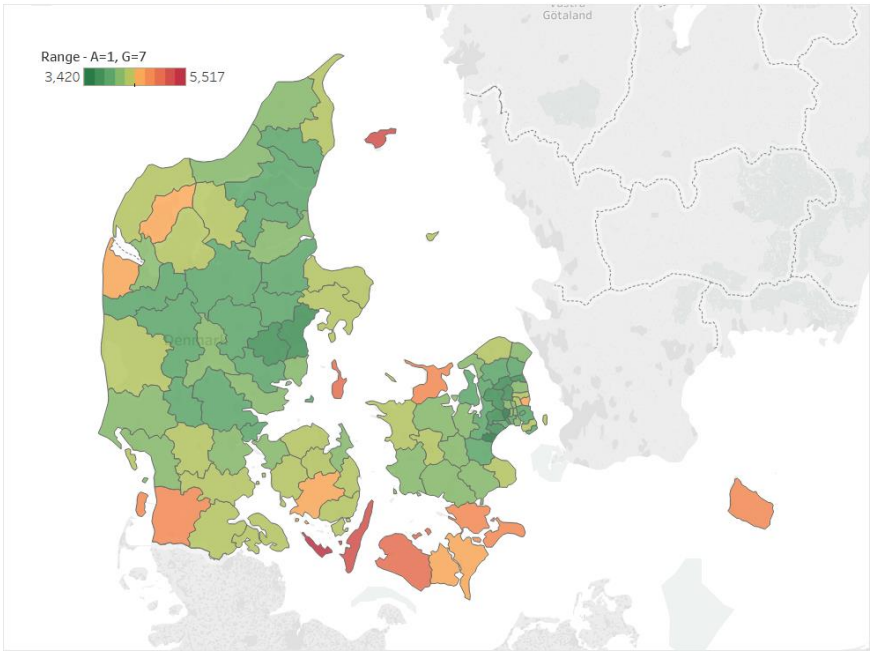
Heating source	Typical house (euro)	Energy renovated house (euro)
District heating	2.368	2.001
Oil furnace	4.083	2.663

National level results

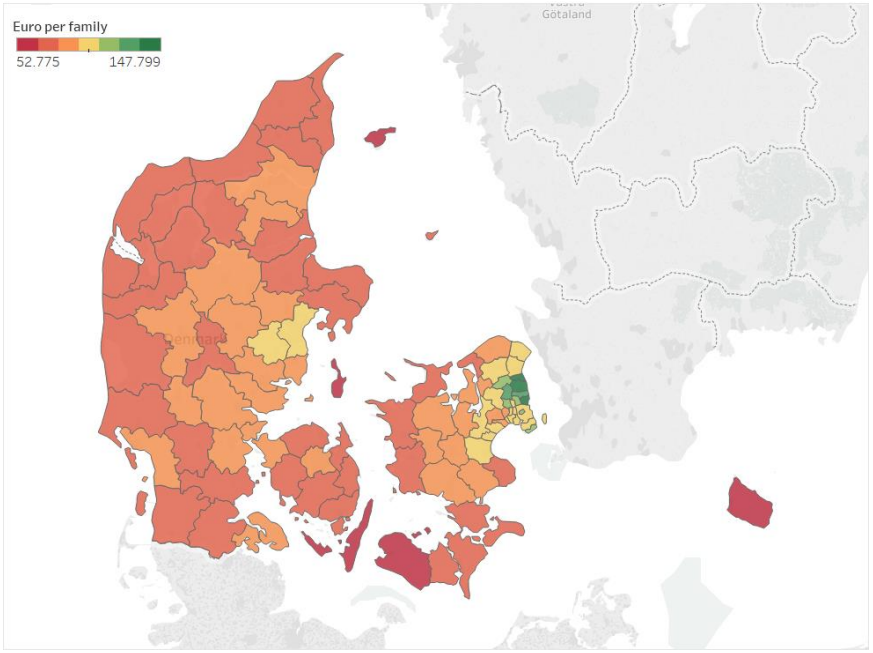
	Change in heating costs if costs increase 10%, euro per year	How much would energy costs to the consumer have to rise to equal a 1% increase in the interet rate on a mortgage loan
D District heating	202	72%
A District heating	58	250%
G Oil furnace	551	26%

Energy efficiency standards and income distribution show correlation across geography

Distribution of energy labels in Denmark, owner occupation



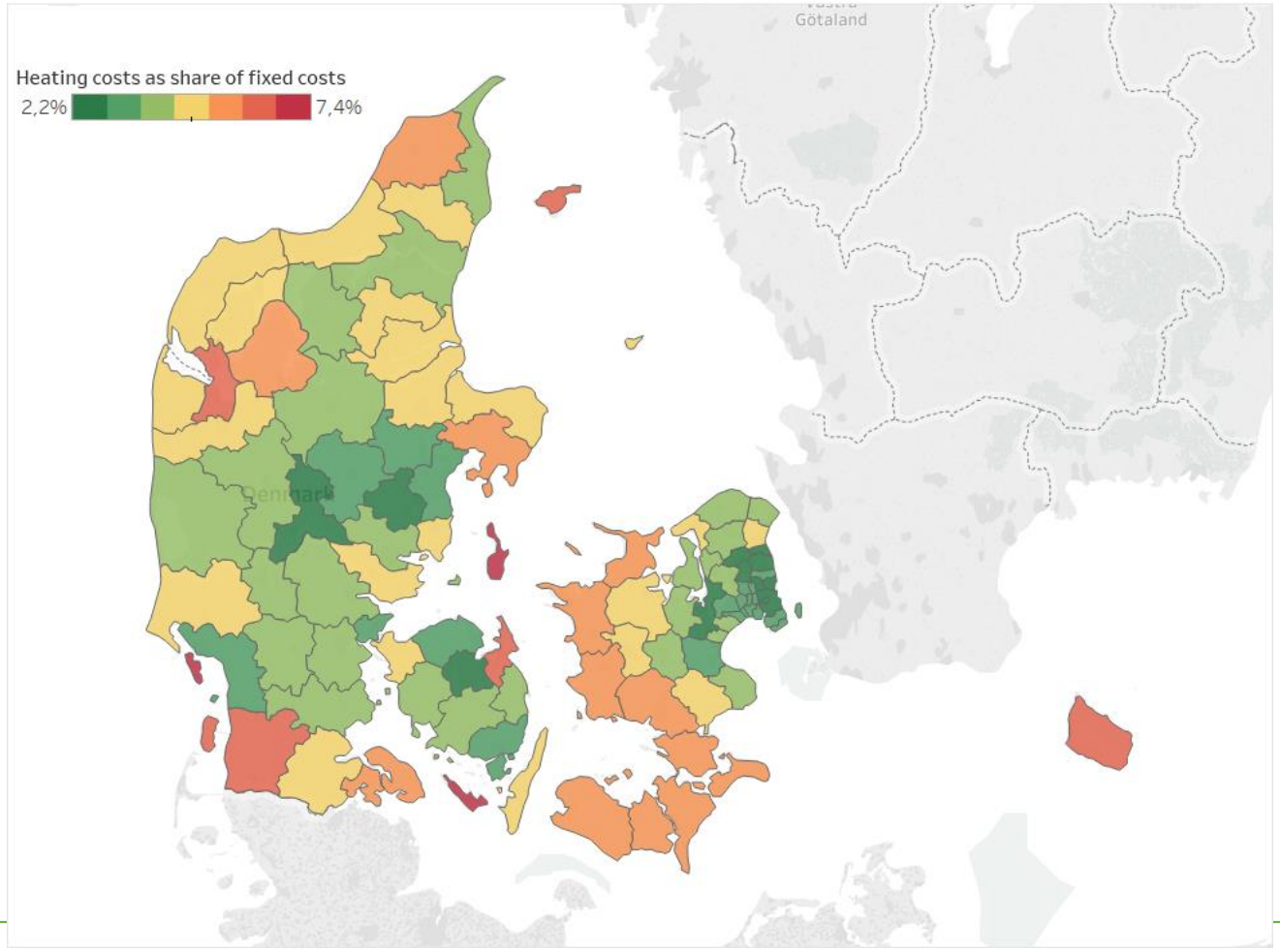
Average family income of owner occupiers



Source: Finance Denmark, Statistics Denmark and own calculations

Energy costs make up a larger share of fixed costs in rural areas

Heating costs as a share of fixed costs are higher in rural areas



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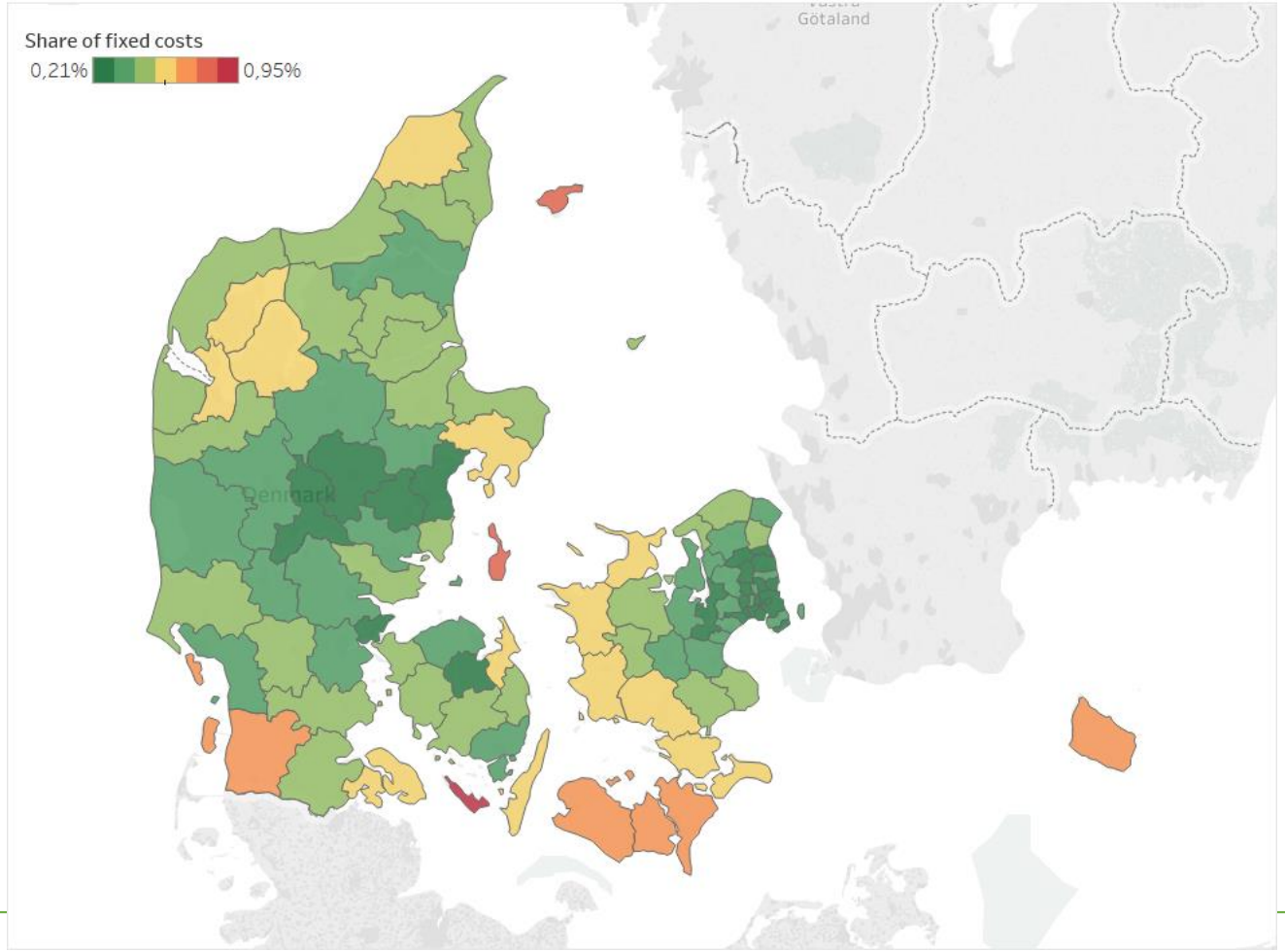
And hence, a uniform energy price increase of 10 % will also impact more in rural areas

Impact on fixed costs of a 10 % increase in heating costs



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Main take aways

The data shows that

- The social impact of an en energy price schock is lobsided, as it will have the biggest impact in rural areas
    - Where energy efficiency standards are lower
    - Where family incomes are lower
- Energy efficient mortgages potentially will have the biggest carbon impact if they can also become attractive to lower income families living in rural areas
- Energy efficient mortgages creating energy improving investments can help make families less vulnerable to energy price swings
- Transportation costs weigh more in fixed costs in rural areas

Panel Debate: Pilot Scheme Roadmap
The way forward

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Energy Efficient Mortgages Initiative

Questions & Answers

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Conclusions & Next Steps

Luca Bertalot,
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Energy Efficient Mortgages Initiative

Partners

EMF | ECBC FUNDING THE REAL ECONOMY

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For additional information on the Energy Efficient Mortgages Initiative

- Visit: http://www.energyefficientmortgages.eu/
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