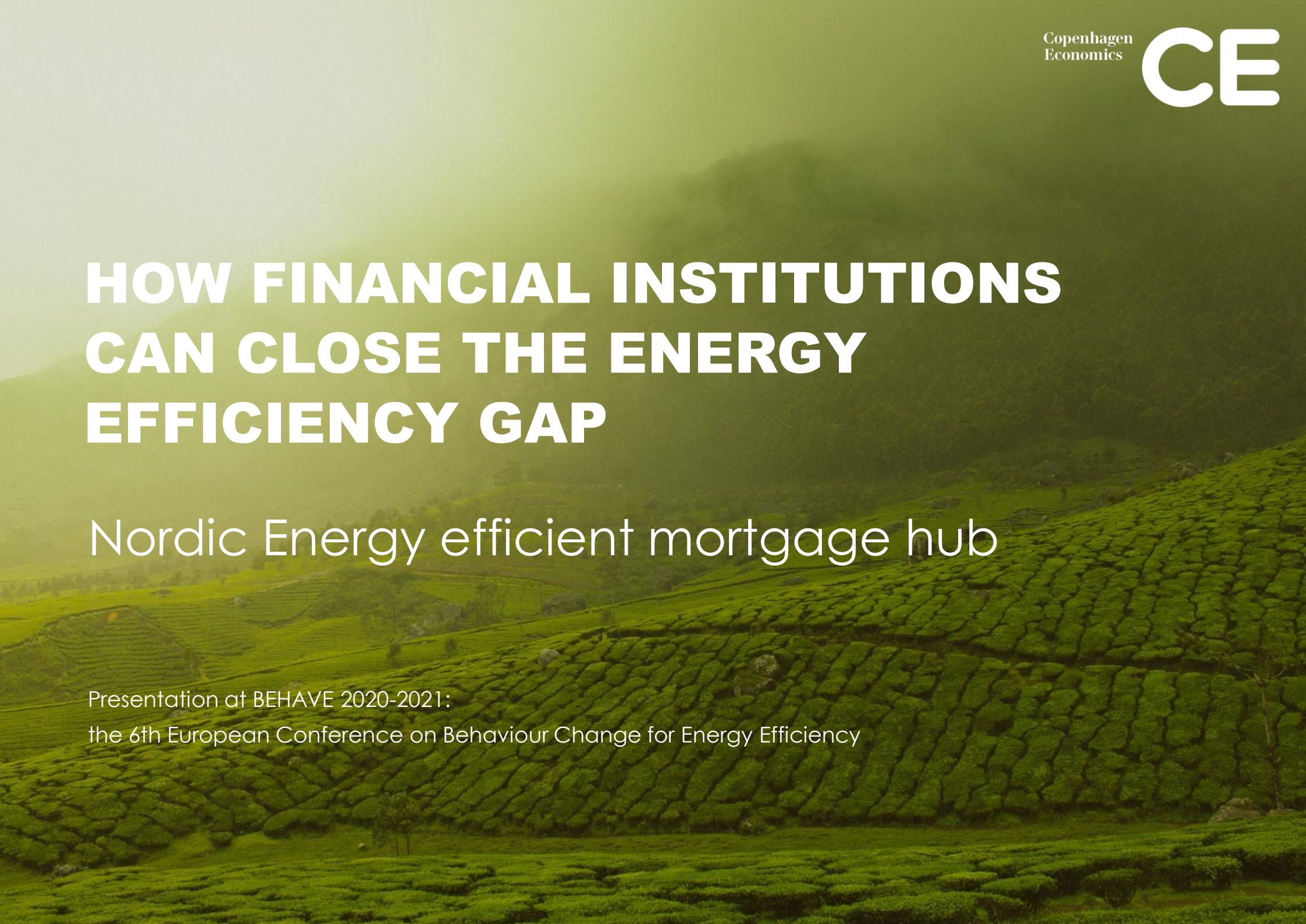


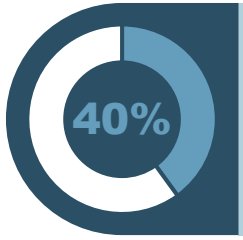
Copenhagen Economics

# HOW FINANCIAL INSTITUTIONS CAN CLOSE THE ENERGY EFFICIENCY GAP

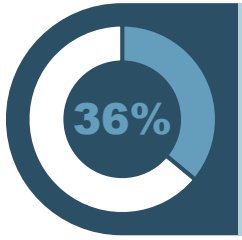
## Nordic Energy efficient mortgage hub

Presentation at BEHAVE 2020-2021:
the 6th European Conference on Behaviour Change for Energy Efficiency

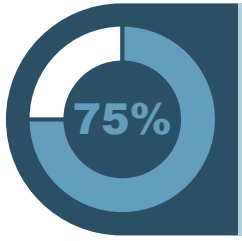
# Why care about energy renovations of buildings?



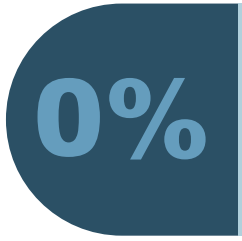

Buildings are responsible for 40% of the energy consumption in the EU




Around 36% of CO2 emissions in the EU is from buildings




75% of the building stock is not energy efficient




**Key challenge: bring this down to 0%**

**Green transition through**

- Increasing Energy Efficiency
- Green electrification of the economy

**Energy renovations include**

- Energy Efficiency renovations
- Smart energy systems for buildings
- Electrification of heating systems

# BACKGROUND FOR THE HUB – THREE UNDERLYING PREMISES THAT HAS SHAPED THIS HUB

# Premise #1: Energy efficiency gap

## Problem

- Households and companies do not conduct energy renovations
- Even when it is profitable: **Capital costs < savings on energy bill**
- This is the energy efficiency gap

## Consequences

- **Large problem today:** Fewer renovations is undertaken
- **Bigger problem in the future**: Future policy initiatives to incentivise energy renovations will not be as effectful

# Premise #2: The energy efficiency gap is not new

- It has been discussed the past 10 years
- We know on a high level what are the barriers:
  - Information to consumers
  - Inadequate data to:
    - Identify customers and buildings
    - Verify the effect of actual investments
  - High transaction costs – too many point of contacts
- The problem is implementation of solutions!

# Premise #3: Financial institutions are in a key position to implement solutions

**Financial institutions have unique customer contact**

90% of energy renovations takes place in connection with other renovations

Financial institutions are already involved to finance the renovations and has a unique touch point with customers

# HOW CAN FINANCIAL INSTITUTIONS IMPLEMENT SOLUTIONS TO OVERCOME THE ENERGY EFFICIENCY GAP?

# The Nordic Energy Efficient Mortgage hub

## Experts

Copenhagen Economics CE

Green Digital Finance Alliance

iNudgeyou THE DANISH NUDGE UNIT

EMF EUROPEAN MORTGAGE FEDERATION

DTU Compute
Department of Applied Mathematics and Computer Science

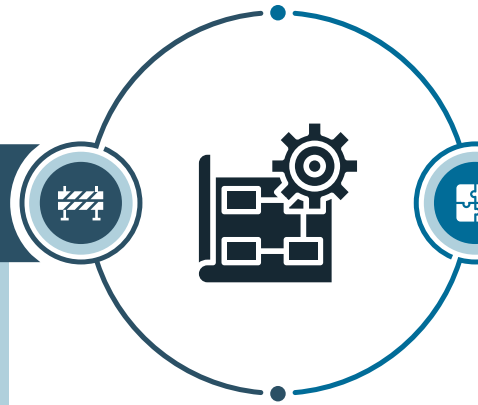
## Market demonstrators

Hemma

**Two large Nordic banks**

**Test solutions to overcome barriers within the three institutions**

# Solution #1: Better data access



## Barriers

### Lack of data

- Difficult to identify customers in need of energy renovations and type of renovation needed
- Lack of clear framework – what should be done?
- Difficult to verify the "greenness" of the renovation

## Solutions

### Increase level of data

- Utilize new types of data, combine energy consumption data with weather data
- Provide clear recommendations on what should be done
- Allow digitalised automated verification process of the renovation.

# Solution #2: Better information

**Barriers**

**Behavioural biases**

- Lack of transparent information and behavioral biases is a major challenge.
- Customers are not aware of the benefits of energy renovations.

**Solutions**

**Consumer guidance**

- Provide targeted information with the right timing (when buying a new home and considering other renovations) to nudge the customer in the right direction.

# INudgeyou: practical examples

## THIS IS HOW YOU GET STARTED

Shortest Payback time

### Isolation of horizontal skunk

Isolate the horizontal skunk with 400 mm. isolation. The renovation takes approx. 1-2 days and is typically performed by a carpenter.

**Next step: Call one or more carpenters and get a quote on renovations**

**Savings 1,900 kr/annually**

**CO2 reduction 370 kg/ annualy**

**Investment Approx. 9,200 kr.**

### Internal re-insultation of walls

Re-insult the internal walls against the basement with 200 mm. isolation. The renovation typically takes 1 week and is performed by a carpenter.

**Next step: Call one or more carpenters and get a quote on renovations**

**Savings 1,900 kr/annually**

**CO2 reduction 200 kg/ annualy**

**Investment Approx. 34,400 kr.**

Largest annual savings

Most climate friendly

### Installation of solar cells

Install 11.5 sqm. Solar cells on the roof's south side. The energy consultant recommends solar cells of the type Monokrystallinske silicium. The installment takes approx. 1 week and is performed by an electrician or a carpenter.

**Next step: Call one or more electricians and carpenters and get a quote on the installment.**

**Savings 2,400 kr/annually**

**CO2 reduction 370 kg/ annualy**

**Investment Approx. 34,500 kr.**

The three suggestions presented here are taken from your home's energy label report. If you wish to read the full report, then click on sparenergi.dk and "find dit energimærke" and insert your address.

**The information and figures provided are also taken from the energy label report.**

## ENERGY RENOVATE YOUR HOME AND SAVE MONEY

Energistyrelsen

Eggertsvej 34, 5700 Svendborg

**Annually calculated heat consumption**

| | |
|---|---|
| 10.090 kWh district heating | 20,719 kr |
| Total energy expenditure | 10,719 kr |
| Total $CO_2$ emissions | 1.96 ton |

D

## THE ENERGY CONSULTANT'S RECOMMENDATIONS FOR YOUR HOME

The three suggestions with the largest savings potential

**Isolation of horizontal skunk with 400 mm. Isolation**

| | |
|---|---|
| **Annual savings** | **1,900kr** |
| Investment (approx.) | 9,200kr |
| Payback time | 4.8 years |
| Annual $CO_2$ reduction | 200 kg |

**Internal re-insulation of walls with unheated rooms**

| | |
|---|---|
| **Annual savings** | **1,900kr** |
| Investment (approx.) | 34,000kr |
| Payback time | 18.1years |
| Annual $CO_2$ reduction | 200 kg |

**Installation of solar cells**

| | |
|---|---|
| **Annual savings** | **2,400kr** |
| Investment (approx.) | 34,500kr |
| Payback time | 14.4years |
| Annual $CO_2$ reduction | 370 kg |

**Total annual savings for all three renovations: 6,200 kr.**

**Total annual CO2 savings for all three renovations: 770 kg.**

**Total investment for all three renovations: Approx. 77,700 kr.**

# Solution #3: Lower transaction costs

## Barriers

**Transaction costs**

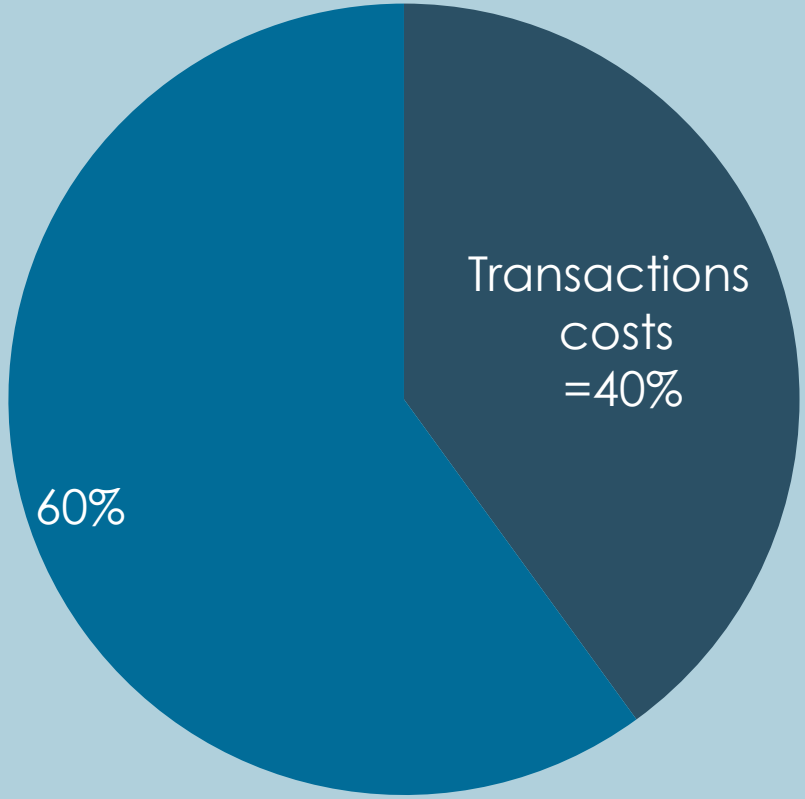
- Many transaction costs relates to the myriad of contact points throughout the process for energy renovations

## Solutions

**Reduce transaction costs**

- Facilitate cooperation between different stakeholders to reduce the number of contact points for customers
- Automating processes

## Transactions costs amounts up to 40% of the total costs

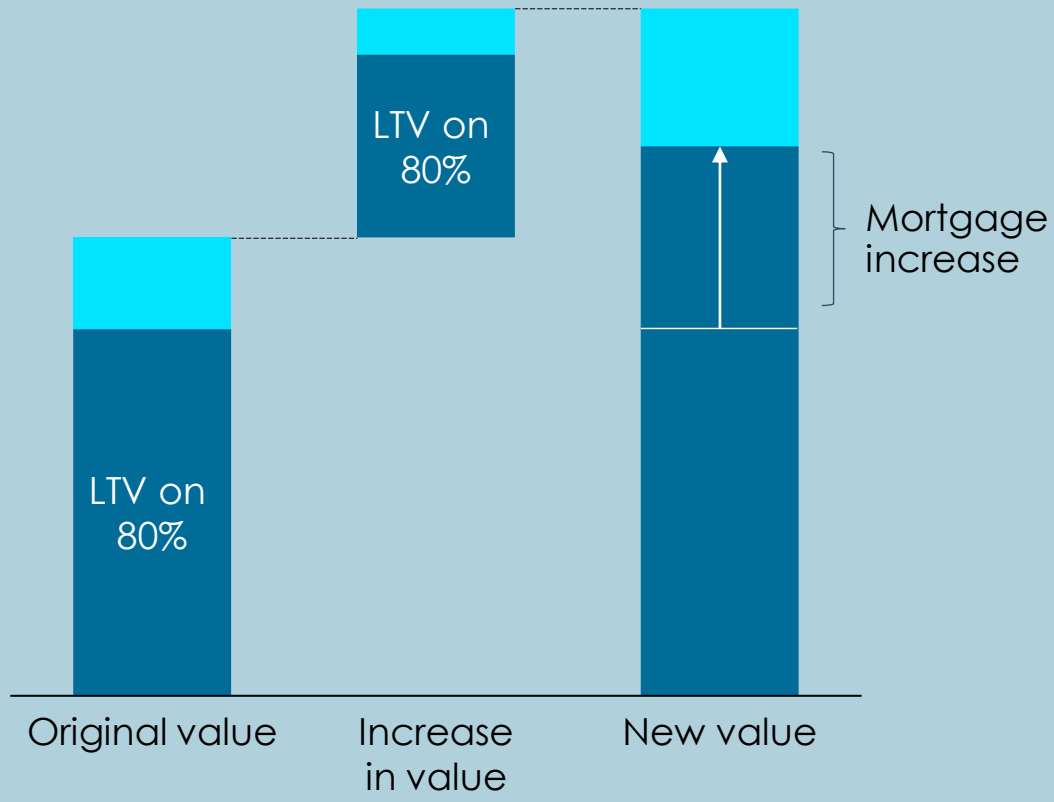


# Solution #4: Correct prudential treatment

Financial institutions has the financial capacity to realize profitable investments

Consumers can use the increase in collateral value to finance the investment

**Increase in collateral value can be used for financing**



# Summary: Solutions to overcome barriers to energy renovations

| Barriers | Solutions |
| --- | --- |
| **Transaction costs**<br>• Could amount to 60% of total costs (in worst cases).<br>• Many transaction costs relates to the myriad of contact points throughout the process for energy renovations. | **Reduce transaction costs**<br>• Facilitate cooperation between different stakeholders to reduce the number of contact points for customers. Both private stakeholders, but also by automating public processes. |
| **Behavioural and informational barriers**<br>• Lack of transparent information and behavioural biases is a major challenge. Customers are not aware of the benefits of energy renovations. | **Consumer guidance**<br>• Provide targeted information with the right timing (when buying a new home and considering other renovations) to nudge the customer in the right direction. |
| **Lack of data**<br>• Difficult to identify customers in need of energy renovations, type of renovation needed, and in the verification that the renovations delivered as promised. | **Increase level of data**<br>• Utilize new type of data, e.g. satellite data, combined with existing database and allow digitalised automated verification process of the renovation. |
| **Financial barriers**<br>• Uncertainty related to risk assessment of lending to energy renovations; there are risk mitigating factors currently not included, which could lead to lower risk-weights and potential lower interest rate for consumers. | **Appropriate risk management and capital issuance**<br>• Proper risk management in a Nordic perspective based on the on-going work in EeMMIP.<br>• Also ensure coherence between green bonds and Nordic mortgage model. |
| **Regulatory barriers, including taxonomy**<br>• The newly adopted taxonomy must fit to Nordic mortgage model and Nordic energy classification systems. | **Regulatory guidance to policy makers**<br>• Guide policy makers based at a national and European level to ensure coherency to the taxonomy and national energy classification systems. |

# The Nordic hub: a two year project

Start of project — Second year

**1 Identification process**

- Identify specific barriers with the general categories
- Identify why the barrier is present
- Test hypothesis with banks and other stakeholders

**2 Solution development**

- Consortium develop the needed solutions
- Consortium partners lead, close contact with banks

**3 Market demonstration**

- Minimum viable product (MVP) of developed solutions tested on selected customers / internally in banks system

**4 Evaluation**

- Evaluation of impact against pre-determined success criteria's
- Eventual adaption of solutions – back to step 2) if new solutions need to be tested

**5 Reporting**

- Report drafting of solution and evaluation
- Analyse implication for full implementation
- Share learning with the rest of the Nordic banking sector





# Hard facts. Clear stories.

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