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The ENGAGE Roadmap

Steps towards the ENGAGE Templates, the Green Investment Portal, and their piloting

European DataWarehouse GmbH (EDW)

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Consortium

EUROPEAN DATAWAREHOUSE

HYPOPORT

Università Ca'Foscari Venezia

UCI

woonnu

DEXAI ARTIFICIAL ETHICS

List of Definitions and Abbreviations

Term/Abbreviation	Definition/Description
ABCP	Asset-Backed Commercial Paper
ABS	Asset-Backed Securities
AI	Artificial Intelligence
API	Application Programming Interface
Climate Delegated Act	Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council
Covered Bond Directive	Directive (EU) 2019/2161 of the European Parliament and of the Council of 27 November 2019
Corporate Sustainability Reporting Directive/CSRD	Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022
DEXAI	Dexai – Etica Artificiale, S.r.l.s.
Disclosure RTS	Commission Delegated Regulation 2020/1224 supplementing Regulation (EU) 2017/2402
Disclosure ITS	Commission Implementing Regulation 2020/1225 supplementing Regulation (EU) 2017/2402
Disclosures Delegated Act	Commission Delegated Regulation (EU) 2021/2178 of 6 July 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council
EBA	European Banking Authority
EC/Commission	European Commission
ECB	European Central Bank
EDW	European DataWarehouse GmbH
EIB	European Investment Bank
EIF	European Investment Fund
EIOPA	European Insurance and Occupational Pensions Authority
ENGAGE	Engage for ESG Activation Investments project
ENGAGE Consortium/Consortium	Member entities of ENGAGE project, jointly considered
ENGAGE Templates	ENGAGE Templates to be developed under the ENGAGE project
EPBD	Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast)
EPBD IV proposal	Revision of the EPBD currently undergoing
EPC	Energy Performance Certificate

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ESAs	The three European Supervisory Authorities (ESAs): EBA, ESMA, EIOPA
ESMA	European Securities and Markets Authority
EU	European Union
EU GBS	Proposal for a Regulation of the European Parliament and of the Council on European green bonds
EU Taxonomy/EU Taxonomy Regulation	Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020
GDPR	Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016
GIP	Green Investment Portal. IT infrastructure to be developed under ENGAGE project
GAR	Green Asset Ratio
H2020	Horizon 2020
HYP	Hypoport, B.V.
ISC	International Science Council
LTV	Loan-to-Value
MBS	Mortgage-Based Securities
MEPS	Minimum Energy Performance Standards
Mortgage Credit Directive/MCD	Directive 2014/17/EU of the European Parliament and of the Council of 4 February 2014
Non-Financial Reporting Directive/NFRD	Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014
NZEB	Nearly Zero-Energy Building
Project Coordinator	Project Coordinator
Securitisation Regulation	Regulation (EU) 2017/2402 of the European Parliament and of the Council of 12 December 2017
Sustainable Finance Disclosure Regulation/SFDR	Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019
Technical Standards on Disclosure Requirements	The Disclosure RTS and ITS, jointly
UCI	Unión de Créditos Inmobiliarios, S.A., Establecimiento Financiero de Crédito
UNIVE	Università Ca' Foscari Venezia
WOO	Woonnu, B.V.
ZEB	Zero Emmission Building

The ENGAGE Roadmap

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Contents

List of Figures

List of Tables

Executive Summary

ENGAGE is an EU-funded project launched in November 2022 by a consortium of six entities (EDW, HYP, UNIVE, WOO, UCI and DEXAI) with the purpose of creating a future-proof data and innovative funding framework for energy efficient mortgage and renovation financing. It aims to make sustainable energy investments more attractive to private investors and align them with the EU's sustainable finance policy.

Over the three-year project duration, the ENGAGE Consortium will focus on developing standardised data disclosure templates (the ENGAGE Templates) and taxonomies for mortgage and home renovation loans in line with the most relevant European regulations, starting with the EU Taxonomy Regulation. Considerations stemming from other sustainable finance regulations like the SFDR or the EU GBS might also be added to the disclosure regime at a later stage of the project.

The ENGAGE Templates will be operationalised through the GIP.

This document outlines the key concepts and results of the ENGAGE project and aims to:

a) Introduce a comprehensive, high-level picture of the ENGAGE project framework in its regulatory and business context; and
b) Depict the organisational, legal, and technical bedrock for ENGAGE results.

For the above purpose, the regulatory landscape in the EU and the role that ENGAGE can fulfil against that background will be outlined, as well as the issues it can mitigate for key stakeholders.

The ENGAGE Templates design considerations will be addressed, as well as the high-level description of the key elements that will be taken into account for the development of the GIP and an overview of the pilots' roles.

"The ENGAGE Roadmap" pursues to present the added value of ENGAGE in the regulatory and business framework and the issues it can tackle, as well as clarify the areas that will not be in focus during the project.

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1. Regulatory Background and Challenges

1.1 EU regulatory developments

The EU acknowledged in the European Green Deal, published in December 2019, that buildings accounted for a significant portion[1] of total energy consumption and carbon emissions. The European Green Deal[2] aimed to address the twin challenge of energy efficiency and affordability and encouraged Member States to engage in a "renovation wave" of public and private buildings.

In line with this goal, the EU launched the Renovation Wave strategy[3] in October 2020, a key initiative aimed at transforming the building sector into a more sustainable and energy-efficient sector.

The underlying rationale behind the Renovation Wave strategy is not only environmental, but also social and economic. Energy-efficient buildings not only contribute to the efforts against climate change but also provide numerous benefits, such as:

- Reduced energy costs: energy-efficient buildings require less energy for heating, cooling, and lighting, resulting in lower utility bills.
- Enhanced comfort: better insulation, efficient heating and cooling systems, and the use of design techniques contribute to a more comfortable indoor environment.
- Improved air quality: energy-efficient buildings often incorporate ventilation systems that reduce indoor air pollutants and improve overall air quality.
- Increased property value: buildings with higher energy-efficiency ratings tend to command higher market values, making them attractive long-term investments.

[1] According to the Renovation Wave Communication, the building sector, including residential and non-residential properties, is responsible for approximately 40% of energy consumption and 36% of CO_2 emissions in the EU. Improving energy efficiency in buildings is, therefore, crucial for achieving the EU's ambitious climate goals, which include a 55% reduction in greenhouse gas emissions by 2030 and climate neutrality by 2050.
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576150542719&uri=COM%3A2019%3A640%3AFIN
[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1603122220757&uri=CELEX:52020DC0662

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In the European Green Deal the Commission stated the objective of achieving climate neutrality by 2050[4] through a phased approach, namely, by achieving the intermediate objective to reduce CO2 emissions by at least 50% and towards 55 by 2030 (baseline = 1990)[5]. Several ambitious programmes, such as Fitfor55,[6] have been subsequently announced to fulfill this objective.

Two important EU legislations underpin the European Green Deal, the Renovation Wave strategy, and the Fitfor55 programme: the EU Taxonomy Regulation[7] and the EPBD recast[8].

EU Renovation Wave

In October 2020, the Commission presented its Renovation Wave strategy, as part of the European Green Deal. It contains an action plan with concrete regulatory, financing, and enabling measures to boost building renovation. Its objective is to at least double the annual energy renovation rate of buildings by 2030 and promote deep renovations.

As a key component of the European Green Deal, the Renovation Wave seeks to improve energy efficiency, reduce greenhouse gas emissions, and tackle energy poverty for vulnerable households. However, the success of this initiative relies heavily on securing sufficient and adequate funding, which is generally not available. In this sense, the Commission highlighted in the Renovation Wave communication that "*In the residential building sector, the lack of simple, attractive and easily accessible public incentives for renovation and the lack of mainstream financing products are often mentioned as a barrier*".

The mobilisation of investments for energy efficiency projects had already been pointed out as a challenge in the European Green Deal, where the Commission noted that a crucial element in attaining the defined goals would be the financing of the energy efficiency transition and thus, acknowledged that there was a need to direct investments towards sustainable projects and activities. To achieve this, a common language and a clear definition of what "sustainable" means would also be required. As a result, the action plan on financing sustainable growth called for the creation of a common classification system for sustainable economic activities, or an "EU Taxonomy."

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[4] Echoing the European Commission Communication of 28 November 2018 "*A Clean Planet for all A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy*".

[5] The European Green Deal originally envisaged the reduction by 2030 of at least 50% of greenhause gas emissions towards 55% reduction. The Commission Communication *Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people* of 17 September 2020 confirmed the objective of increasing the emissions reduction objective to at least 55% by 2030.

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0550

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32020R0852

[8] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02010L0031-20210101

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The EU Taxonomy – A new language

The EU Taxonomy is an EU-wide classification system for sustainable activities, introduced in 2022, that aims to drive sustainable investment by providing clear science-based definitions for economic activities that significantly contribute to environmental objectives. Its concept emerged from a growing recognition to urgently address climate change and other environmental challenges, coupled with the realisation of the financial sector's crucial role in this transition.

The Commission, aware of the potential for sustainable finance to contribute to EU climate goals, began working on a comprehensive strategy to reorient capital flows towards sustainable investments. In May 2020, the European Parliament and the Council reached an agreement on the Taxonomy Regulation, which established the legal framework for the EU Taxonomy.

The Taxonomy Regulation sets six environmental objectives:

1. climate change mitigation;
2. climate change adaptation;
3. the sustainable use and protection of water and marine resources;
4. the transition to a circular economy;
5. pollution prevention and control;
6. the protection and restoration of biodiversity and ecosystems.

The Taxonomy Regulation intends to help channel capital towards projects and investments that contribute to the EU's climate and environmental goals, fostering the transition towards a sustainable, low-carbon economy. It establishes the criteria for an economic activity to be considered environmentally sustainable:

a) The economic activity **substantially contributes** to one or more of the environmental objectives set in the EU Taxonomy Regulation;
b) The economic activity **does not significantly harm** any of the environmental objectives set in the EU Taxonomy Regulation;
c) The economic activity is carried out in compliance with the **minimum safeguards** foreseen in the EU Taxonomy Regulation; and
d) The economic activity complies with **technical screening criteria** established by the Commission through delegated acts[9].

[9] The first delegated act, which focuses on technical screening criteria for economic activities significantly contributing to climate change mitigation and adaptation (known as the "Climate Delegated Act"), was adopted on June 4, 2021. A subsequent delegated act addressing the remaining four environmental objectives (referred to as the 'Environmental Delegated Act') was adopted in draft status on 13 June 2023. The Climate Delegated Act is available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R2139; the draft Environmental Delegated Act is available at https://finance.ec.europa.eu/system/files/2023-06/taxonomy-regulation-delegated-act-2022-environmental_en.pdf

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Under Article 8(1) of the Taxonomy Regulation, certain large enterprises required to publish non-financial information under the NFRD ("undertakings") must disclose to the public the manner and extent to which their activities align with environmentally sustainable economic activities defined by the EU Taxonomy Regulation and delegated acts. The scope of undertakings covered by Article 8 of the Taxonomy Regulation is expanded by the CSRD.

The Climate Delegated Act

The Climate Delegated Act is a key component of the EU Taxonomy, which aims to provide a clear and consistent framework for determining environmentally sustainable economic activities substantially contributing to the climate change mitigation and climate change adaptation objectives.

In accordance with the general qualification criteria provided in the Taxonomy Regulation, the Climate Delegated Act elaborates on the technical screening criteria, the"do not significant harm" principle, and the minimum social safeguards with which entities have to comply in order to determine whether the relevant economic activity is EU Taxonomy-aligned.

The Disclosures Delegated Act[10]

The Disclosures Delegated Act sets out the content, methodology, and presentation of the information to be disclosed by financial and non-financial undertakings concerning the proportion of environmentally sustainable economic activities in their business, investments, or lending activities. One of its most important features is the introduction of key performance indicators (KPIs) on Taxonomy-aligned investments and expenditures. Most notably, it describes the calculation method for the GAR.

The Energy Performance of Buildings Directive

The EPBD is a key EU legislative act that aims to improve the energy efficiency of buildings and reduce greenhouse gas emissions. Since its inception in 2002, the EPBD has undergone several revisions to meet evolving environmental and technological challenges. By promoting the concept adoption of NZEBs[11] and encouraging building renovations, the EPBD contributes to reducing greenhouse gas emissions, improving energy security, and creating more sustainable and healthy buildings.

The EPBD is currently under its fourth review. One of the key elements proposed in the EPBD recast is the introduction of the concept "Minimum Energy Performance Standards" (MEPS).

[10] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02021R2178-20230101. The Disclosures Delegated Act has been amended by the Environmental Delegated Act, which shall apply from 1 January 2024.

[11] According to the EPBD recast in force, a NZEB is a building that has a very high energy performance, as determined in accordance with Annex I of the EPBD. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

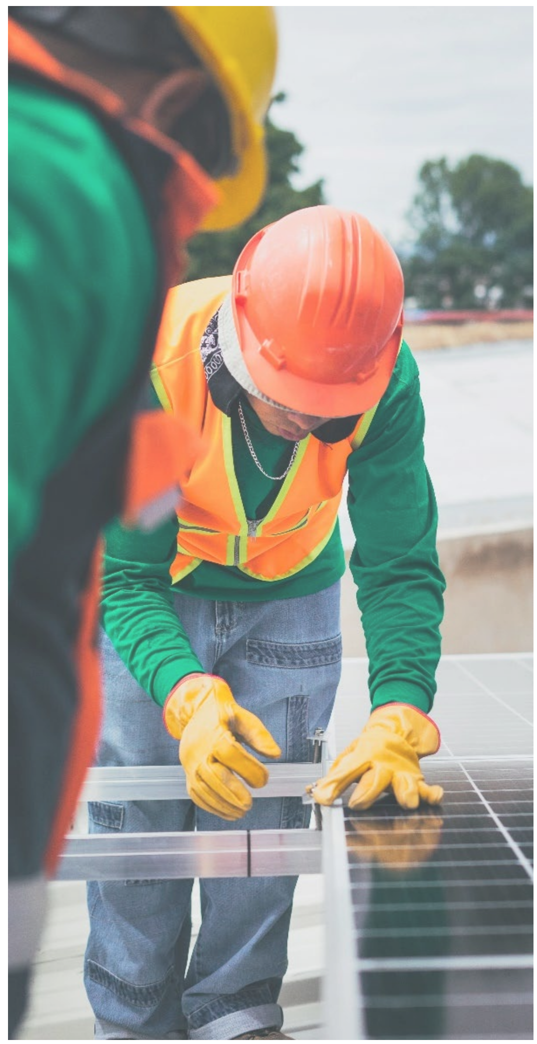
The MEPS system requires the renovation of buildings that fall under EPC classes G or F, which are the worst performing buildings in terms of energy efficiency. The G rating represents the 15% worst performing buildings in each country, while the remaining buildings are proportionally distributed among the other classes from G to A. Class A represents a zero-emission building.

In addition, the EPBD recast highlights the crucial role of energy efficient mortgages and loans to facilitate the Renovation Wave.

1.2 The energy efficiency funding gap

The EU Renovation Wave, in conjunction with the European Green Deal, sets targets to promote sustainable building practices and energy efficiency. The key objectives include:

a) Increasing the rate of building renovations to double the annual renovation rate of buildings in the EU, from the current average of around 1% to at least 2% per year. This target seeks to stimulate demand for renovations, to create jobs, and to accelerate the transition to energy-efficient buildings.
b) Improving energy efficiency by setting higher performance standards for renovated buildings. This includes measures such as upgrading insulation, heating, and cooling systems, using renewable energy sources, and implementing smart building technologies.
c) Promoting sustainability in building practices by encouraging the use of environmentally friendly materials, reducing waste, and improving the circularity of construction and demolition processes. It also emphasises the importance of social sustainability, including measures to improve indoor air quality, accessibility, and affordability of housing.
d) Mobilising investments to support building renovations, including leveraging public and private funding, promoting innovative financing models, and encouraging investment in energy-efficient and sustainable building projects.



To achieve its objectives, the European Renovation Wave foresees a range of both national and EU policy measures and tools, including:

a) An enhanced regulatory framework for building renovations, including the revision of the EPBD and the development of new regulations and standards to promote energy efficiency and sustainability in buildings.
b) Financial incentives to stimulate demand for building renovations, including grants, subsidies, tax incentives, and low-cost financing options. It also seeks to attract private investments through mechanisms such as the European Green Deal Investment Plan and the European Investment Bank's Sustainable Infrastructure Facility.
c) Technical support and capacity building to building owners, industry professionals, and local authorities to improve their knowledge and skills in sustainable building practices. This includes training programs, information resources, and best practice sharing.
d) Stakeholder engagement in driving sustainable building practices, including close collaboration between national and local authorities, building owners, industry stakeholders, and civil society.

Nevertheless, the Commission also stressed the challenge for further funding mobilisation, stating that 800,000 social homes needed renovation each year, requiring an estimated EUR 57 billion of additional funding per year[12].

In February 2023, the EIB made the below estimates available on the funding gap for the building sector in the EU, indicating the investments needed to reach the EU's intermediate climate targets for the year 2030. ENGAGE will primarily focus on the Energy Efficiency and Renewables areas.

Table 1: Funding gap estimations as of February 2023. Source: EIB, presentation at the Energy Efficient Mortgages Initiative (EEMI) Trento Bauhaus Week on 14 February 2023

Funding Gap[13]	Current	Needs	Gap
Energy Efficiency	114 EUR bn/year	281 EUR bn/year	167 EUR bn/year
Renewables	50 EUR bn/year	65 EUR bn/year	15 EUR bn/year
Grid	42 EUR bn/year	60 EUR bn/year	18 EUR bn/year
Total	*206* EUR bn/year	*406* EUR bn/year	*200* EUR bn/year

Securing funding is essential for the successful implementation of the EU Renovation Wave. By employing the potential of ABS, private capital can be mobilised to finance energy-efficient building renovations, supporting the EU's climate goals in three main areas:

[12] Report of the High-Level Task Force on Investing in Social Infrastructure in Europe, January 2018
[13] According to the European Investment Bank presentation held on 14 February 2023 at the I Energy Efficient Mortgages Initiative (EEMI) Trento Bauhaus Week.

1. Decarbonising heating and cooling: the Renovation Wave addresses the reduction of the EU's reliance on fossil fuels for heating and cooling and promotes the use of renewable energy sources and efficient systems, such as heat pumps and solar panels.
2. Tackling energy poverty by prioritising the renovation of the least energy-efficient buildings, often occupied by low-income households.
3. Supporting public and private investment by encouraging investments in energy-efficient renovations through financing options, incentives, and technical assistance to both public and private stakeholders.

In addition to private capital, specific instruments of public institutions like the EIB and EIF can play a key role in the uptake of the EU Renovation Wave and promote investments in energy-efficient real estate.

1.3 The European mortgage funding framework

Mortgages play a significant role in the European financial landscape, as they facilitate homeownership and contribute to economic growth.

The funding of mortgages in Europe involves various sources, with structured finance being a critical component. This section provides an overview of mortgage funding in Europe, focusing on the role of structured finance in supporting the mortgage market.

Mortgage financing in Europe is typically offered by the following types of financial institutions:

- Banks: banks are the traditional source of mortgage funding in Europe. They offer mortgage loans to borrowers based on their creditworthiness, income, and other factors. Banks may offer fixed or variable interest rate mortgages, with loan terms typically ranging from 10 to 30 years. Borrowers usually provide a down payment, and the mortgage is secured by the property being financed.
- Mortgage lenders: focus solely on providing mortgage loans. These lenders may have more flexible lending criteria and offer specialised mortgage products tailored to specific types of borrowers, such as first-time homebuyers, self-employed individuals, or those with less-than-perfect creditworthiness.

The most traditional source of mortgage funding in Europe comes from customer deposits held by banks and financial institutions. These deposits provide a stable and low-cost funding base for mortgage lending. However, funding is often raised via capital market transactions.

The most common forms of structured finance funding are:

- Securitisation: mortgage loans are packaged together and sold to investors as MBS. This allows lenders to raise capital by transferring the risk associated with the mortgage loans to investors. Securitisations are subject to the Securitisation

Regulation[14], which lays down a general framework for securitisation and creates a specific framework for simple, transparent, and standardised securitisation.

- Covered bonds: covered bonds are a specialised form of mortgage funding in Europe. Covered bonds are debt securities issued by banks or other financial institutions and are backed by a pool of high-quality mortgage loans. The issuer retains the ownership of the mortgage loans and pledges them as collateral for the covered bonds. Covered bonds provide an additional source of funding for mortgage lending and are subject to specific regulations, such as the EU Covered Bond Directive[15], which imposes requirements on issuers, collateral quality, and reporting.

While both covered bonds and securitisation play important roles in mortgage funding, there are key differences between the two instruments:

- Balance sheet treatment: covered bonds remain on the issuer's balance sheet, while securitised mortgage loans are typically removed from the balance sheet and sold to investors. As a result, covered bonds are considered less risky for investors, as they retain recourse to the issuing bank.
- Asset quality: covered bonds are backed by high-quality mortgage loans, while mortgage-backed securities can include a range of mortgage loan qualities. This difference in asset quality may impact the risk profiles and credit ratings of the two instruments.
- Regulatory oversight: covered bonds are subject to strict regulatory oversight, including the EU Covered Bond Directive. On the other hand, securitisation is regulated through the Securitisation Regulation, which provides a framework for risk retention and transparency requirements.
- Market size: the covered bond market is larger and more established than the MBS market in Europe, providing a more liquid and accessible source of funding for mortgage lenders.
- Reporting regime: the types of disclosure requirements applicable, and the data used in these funding instruments, differ greatly. Without prejudice to these differences, the ESA's and ECB recently expressed their strong advice to gather climate (risk) related data at origination of mortgages and loans relating to structured finance products, irrespective of the funding instrument type, in the *Joint Statement on Disclosure on Climate Change for Structured Finance Products*[16] issued on 13 March 2023.

In addition to the already mentioned (traditional) balance sheet loans (via bank deposits), there are other forms of funding, such as direct (bilateral) investment funds for institutional investors, unsecured funding, and originate-to-distribute funding models.

[14] https://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex:32017R2402
[15] https://eur-lex.europa.eu/eli/dir/2019/2162/oj
[16] https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Other%20publications/2023/1052796/ESAs_ECB%20Joint%20Statement%20on%20disclosures%20for%20securitisations.pdf

ENGAGE will focus on securitisations and covered bonds with residential real estate as collateral, which are both backed by the same type of underlying assets: residential mortgage and home renovation loans.

1.4 The ENGAGE strategy

Against this background, ENGAGE aims to activate investments in energy efficiency projects to bridge the funding gap in sustainable finance by means of promoting transparency in the ABS market, in particular, regarding residential mortgages and home renovation loans. To this end, ENGAGE will:

1. develop data disclosure templates in line with the EU Taxonomy Regulation;
2. create an IT infrastructure which assesses the alignment of the relevant activity with the EU Taxonomy;
3. test the templates and the IT infrastructure with two pilot institutions, WOO and UCI, in two EU jurisdictions, i.e., the Netherlands and Spain.

Through the implementation of the ENGAGE Templates and the GIP, ENGAGE aims to solve the current challenges that both lenders and investors, as well as regulators and supervisory authorities, are facing due to the unavailability of standardised and comparable sustainability information.

The table below provides insight into issues frequently faced by relevant stakeholders, along with the solution proposed by ENGAGE.

Table 2: Frequent issues faced by stakeholders and corresponding ENGAGE solution

Stakeholder	Issues	Solutions
Financial Institution	"What data is needed for EU Taxonomy alignment?"	The ENGAGE disclosure framework consists of a set of data templates and documentation that details exactly what data elements are needed for different kind of mortgages or loans in order to assess the EU Taxonomy alignment.
Financial Institution	"Which portfolio is eligible in the ECB collateral framework?"	The GIP can identify and track portfolios that are (in)eligible for the ECB collateral framework.
Financial Institution / Regulator	"What policy is effective?"	The ENGAGE Templates and GIP will detail which mortgage loans are taxonomy-aligned and which ones are not. The assessment and awareness of the sustainability degree of financial institutions' portfolios provides valuable information to both financial institutions and regulatory authorities to make informed decisions on the business or policy strategy.
Investor	"We have a mandate to fund EU Taxonomy-aligned renovation investments, but we have a challenge in	Thanks to the ENGAGE Templates and the GIP, investors will be able to check which investments would be regarded sustainable according to the Taxonomy Regulation.

	identifying eligible investments"	

The following sections address the scope and prerequisites of ENGAGE project that will enable the completion of its three main objectives outlined above.

1.5 The scope of ENGAGE

Financial regulatory scope

ENGAGE will focus on the key EU regulations and directives relevant for residential mortgage and home renovations financing in the EU, namely:

Table 3: Mapping of relevant financial regulations for ENGAGE with ESG components

Regulation or Directive	Summary of Regulation or Directive	ESG elements (existing or upcoming)	ENGAGE Scope
Securitisation Regulation[17]	This Regulation sets out the regulatory framework for securitisations in the EU. It establishes requirements related to transparency, due diligence, risk retention, and disclosure obligations for securitisations, including specific requirements for STS securitisations.	The Securitisation Regulation, as amended in April 2021, includes sustainability factors for STS securitisations. In addition, The ESAs and the ECB stressed in the *Joint Statement on Disclosure on Climate Change for Structured Finance Products* issued on 13 March 2023 the need for further climate-related information on the underlying assets of structured finance products in order to foster the investment in financial products with high ESG standards. The ESAs clarified in the Joint Statement that, as part of the templates review, ESMA intends to introduce new, proportionate, and targeted climate change-related metrics that are useful for investors and supervisors. The new metrics should meet investor needs, considering	Yes, because the Securitisation Regulation disclosure standards are the foundational building block of ENGAGE Templates

[17] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02017R2402-20210409

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		existing market practices and the reporting standards stemming from the relevant EU legislation, such as the EU Taxonomy Regulation, the SFDR and the forthcoming EU GBS.	
Covered Bond Directive	The Covered Bonds Directive sets out the regulatory framework for covered bonds in the EU. It provides harmonised rules for the definition, issuance, and supervision of covered bonds, aiming to enhance the transparency, quality, and stability of covered bond markets across the EU. It establishes requirements related to the cover pool, the issuer, and the supervision of covered bond programs.	The covered bond directive does not contain specific or explicit ESG references. However, it's important to note that the regulatory landscape is constantly evolving and other EU regulations and directives, such as the SFDR, the (forthcoming) EU GBS, the EU Taxonomy Regulation, have implications for covered bonds indirectly, as they set disclosure and classification requirements for financial products, including covered bonds, in the context of sustainable finance and ESG considerations. On top of the above, the Joint Statement on Disclosure on Climate Change for Structured Finance Products of the ESAs and the ECB encouraged originators to collect high-quality and comprehensive information on climate-related risks at the time of loan origination to facilitate investors' due assessment on the underlying assets. The Joint Statement further suggested that, for the sake of creating a consistent, harmonised, and comparable climate-related disclosure framework, the disclosure requirements to be developed for securitisations would aim to become applicable to other funding instruments backed by the same type of underlying assets, such as covered bonds.	Yes, because this financial product is based on the underlying exposure "residential loans and mortgages", which are in scope for ENGAGE.

European Central Bank (ECB) regulations and guidelines	The ECB has issued regulations and guidelines that are relevant to the eligibility of covered bonds and securitisations as collateral for Eurosystem credit operations in the euro area. These may include requirements related to the quality and valuation of assets in the cover pool, the eligibility criteria for covered bonds and securitisations, and the haircuts applied to them.	In 2021 the European Central Bank (ECB) adopted an action plan and roadmap to further incorporate climate change considerations into its policy framework. With this action plan, the ECB will increase its contribution to addressing climate change, in line with its obligations under the EU Treaties. These activities will focus on the following areas: macroeconomic modelling and assessment of implications for monetary policy transmission; statistical data for climate change risk analysis; disclosures as a requirement for eligibility as collateral and asset purchases; enhancement of risk assessment capabilities; collateral framework and corporate sector asset purchases.[18]	Yes, as the ECB communicated[19] in its action plan on climate change-related actions that it was, and would be increasingly, looking at environmental aspects (i.e., via EU Taxonomy definitions) for supervision purposes, collateral framework, and stress testing.
National regulations and guidelines	Each EU Member State may have its own regulations and guidelines that are relevant to the issuance of covered bonds and securitisations within that jurisdiction. These may include requirements related to the legal framework for covered bonds and securitisations, disclosure and reporting obligations, supervision and monitoring of programs, as well as specific requirements for the assets	Many EU Member States have launched national and local initiatives impacting the use and roll-out of energy efficient mortgages and home renovation loans.	Indirectly, national aspects will be incorporated into the ENGAGE Templates.

[18] The ECB noted in its action plan that "*The implementation of the action plan will be in line with progress on the EU policies and initiatives in the field of environmental sustainability disclosure and reporting, including the Corporate Sustainability Reporting Directive, the Taxonomy Regulation and the Regulation on sustainability-related disclosures in the financial services sector*". Document available at: https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210708_1~f104919225.en.html

[19] https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210708_1~f104919225.en.html

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	in the cover pool or securitised assets.		

It follows from the above that ENGAGE solutions will focus on securitisations and covered bonds.

Reporting framework

In Europe, there are several disclosure and reporting standards that are relevant for securitisations and covered bonds. These standards aim to promote transparency, provide information to investors, and ensure compliance with regulatory requirements. In the table below we highlight some of these reporting standards, with the purpose of:

1) indicating the most relevant disclosure standards;
2) indicating which of these standards the ENGAGE framework will build upon.

Table 4: Mapping of other reporting requirements in the financial sector for securitisations and covered bonds

Type	Disclosure	Scope	Granularity	Description	ENGAGE
Mandatory	*The Securitisation Regulation disclosure technical standards*	Securitisation	For underlying exposures: loan and collateral level. For transaction information: aggregated information.	ESMA sets out disclosure requirements for all types of securitisations including details of the structure of the securitisation transaction, of the underlying exposures, and of the performance of the transaction. These templates are known as the ESMA templates, which consist in a range of Annexes to the disclosure RTS and ITS.	In scope
Voluntary	*The Covered Bond Label*	Covered Bonds	Aggregated quantitative and qualitative information.	The Covered Bond Label is a voluntary market standard that sets out disclosure requirements for covered bond issuers. It provides a framework for covered bond issuers to disclose information on the covered bond program,	Partially in scope, as the underlying assets in covered bonds are mortgages and loans.

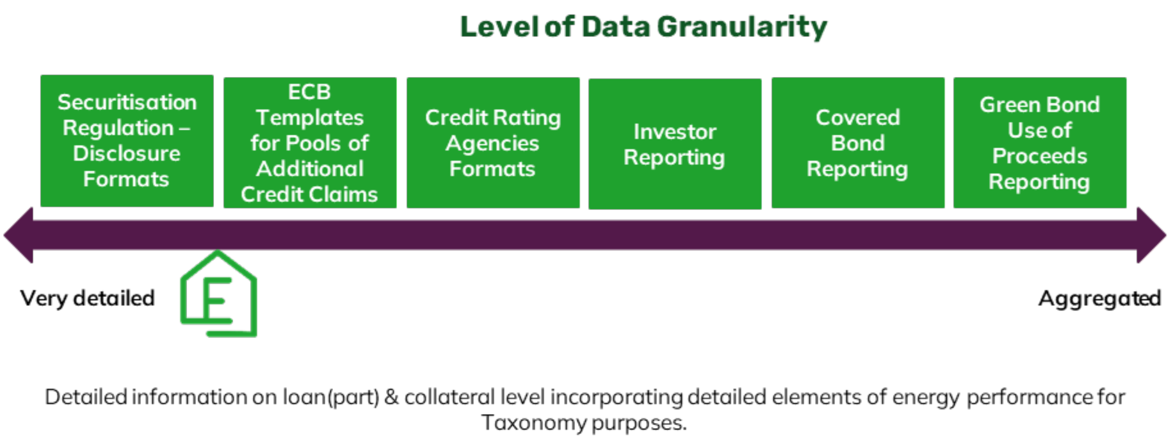
				the cover pool assets, and the issuer's financials, among others, to enhance transparency and promote investor confidence.	
Voluntary	*Green Bond Principles*	Both secured and unsecured	Aggregated information. Often focus on qualitative information and legal documentation.	Information on the proceeds of the green bond. There are within the Green Bond Principles different categories and KPI's that are to be considered for the reporting.	In scope. ENGAGE intends to incorporate use of proceeds financing in the Templates.
Voluntary	*Investor Reporting*	All structured finance products.	Aggregated information. Both qualitative and quantitative	Any proprietary format on the transaction, asset and/or liabilities reporting.	Overlapping scope, as the underlying assets in covered bonds are mortgages and loans. From another perspective, a large part of the investor report can be aggregated by the data elements in the ENGAGE Templates.
Market Practice / Part of (national) regulation	*Credit rating agency disclosure*	All structured finance products.	Typically, loan-level information.	Loan-level format information to check the underlying assets, credit performance and risk assessments.	The ENGAGE Templates will be well suited for credit risk analysis, because it will incorporate detailed energy performance data and cashflow related items.
Eurosystem reporting requirement	*Eurosystem collateral framework*	Portfolio of performing mortgages and	Loan-level information	ECB templates for mortgages and consumer loans applicable to banks only in certain jurisdictions	In scope. Most of the data fields are consistent with the Technical

		consumer loans			Standards on Disclosure Requirements under the Securitisation Regulation.

As shown in the table above, the ENGAGE disclosure regime will encompass most of the existing elements and best practices of both mandatory and voluntary disclosure formats. This way, ENGAGE intends to provide a one-size-fits all disclosure solution that brings added value to a wide range of stakeholders, e.g., financial institutions originating mortgages, credit rating agencies, investors, and regulators.

As the granularity level of the ENGAGE format aims to be high, including loan and collateral information, it will enable the abstraction or aggregation of other types of reports, as required. The diagram below depicts the high-level ENGAGE disclosure framework in relation to the existing reporting standards referenced in this section.

Figure 1: Planned data granularity



On top of the disclosure regime outlined above and as hinted in section 2.3, ENGAGE is also exploring the sustainability-related reporting requirements of EIB and EIF financing instruments, so as to incorporate relevant sustainability-related data fields into its Templates that financial institutions need to report for eligibility in EIB-EIF financing programmes, such as the European Local Energy Assistance or the Private Finance for Energy Efficiency initiative.

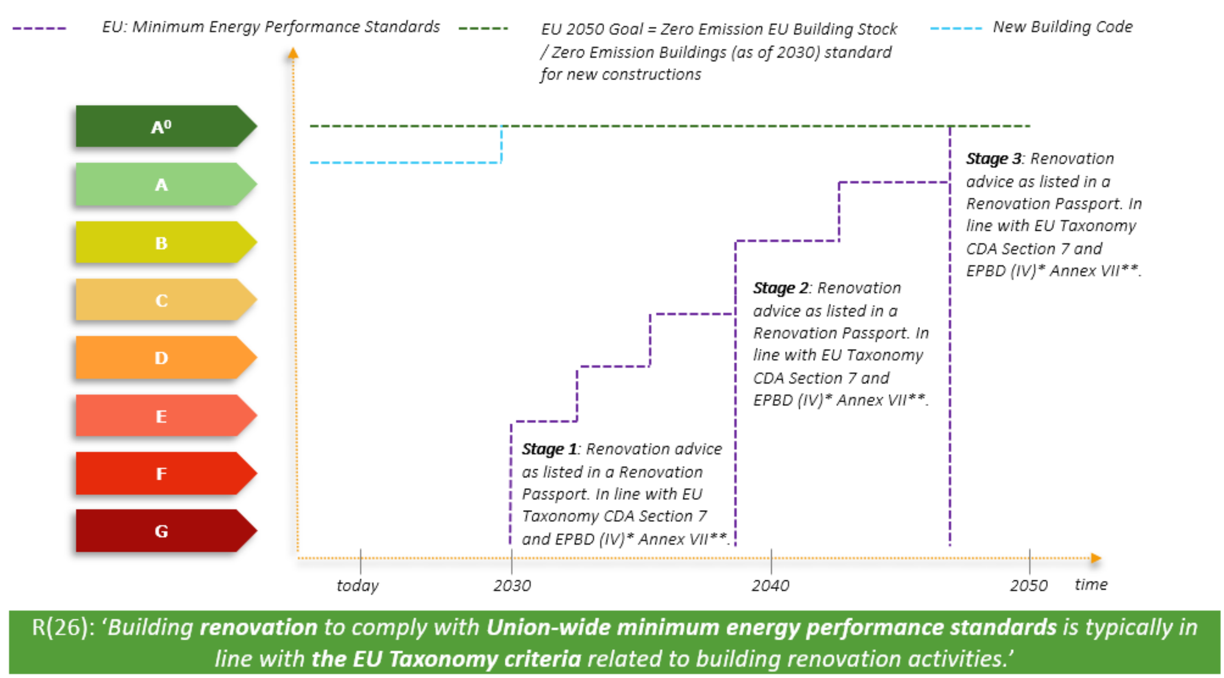
Through this approach, ENGAGE pursues to ease the reporting burden of financial institutions through a one-size-fits-all reporting template that meets diverse requirements and allows for the targeting of multiple sustainable funding options, thereby increasing the chance of receiving private and/or public funding to undertake activities contributing to EU climate goals.

1.6 The road to 2050 and the bigger picture

The financial sector is expected to play an important role in the 2050 decarbonisation targets and the energy efficiency improvement of EU residential building stock by providing a very significant part of the financing required to execute the necessary renovations. Additionally, the insights that financial institutions gain into their clients' financial situations allow them to not only determine whether they can afford to finance a renovation, but can also allow them to estimate the potential benefits of owning a more energy efficient property on their financial situation. This will allow financial institutions to support their customers in undertaking energy efficiency renovations.

The figure below depicts the 2050 goal for residential real estate in the EU, whereby every dwelling will need to be a ZEB house by 2050. The concept of MEPS, as described in Article 9 of the EPBD IV proposal, is also portrayed.

Figure 2: EPC class ladder towards EU MEPS. Interpretation of EU Taxonomy Regulation in conjunction with the EPBD IV proposal



* Which aligns with MEPS (Article 9) and national building renovation plan (Article 3).
** Annex VII of EPBD IV: Comparative methodology framework to identify cost optimal levels of energy performance requirements for buildings and building elements.
*** EPC scale as proposed in EPBD IV council proposal

2. The ENGAGE Disclosure Framework

2.1 General principles for the development of the ENGAGE disclosure framework

The following principles will govern the creation of the ENGAGE Templates, the corresponding data quality framework, and the GIP:

- Data protection principles will be observed during the development of the ENGAGE Templates and the GIP in compliance with the GDPR.
- The ENGAGE disclosure framework will be an add-on to existing market best practices. The framework will be designed to comply with current regulations and standards, mainly, the EU Taxonomy, and potentially, with other regulations like the SFDR and relevant future regulatory developments.
- The framework will be designed to be interoperable with other systems and technologies. This includes using standard data formats and protocols to facilitate data exchange and integration from financial institutions to the GIP.
- The framework aims to be designed to facilitate continuous improvement and innovation. This includes mechanisms for gathering and incorporating user feedback, as well as staying up to date with technological advancements and industry best practices.
- The ENGAGE Templates will aim to be agnostic from a transaction structure to enable their versatile use for a portfolio of (mortgage) loans, for a specific funding structure or for an unsecured green bond transaction.

In fact, the ENGAGE Templates aim to cater for:

- both secured and unsecured underlying exposures (i.e., both mortgages and loans);
- both secured and unsecured funding structures (i.e., financial structured secured by a portfolio of loans and structures that are not secured by loans);
- both newly originated loans and existing portfolios.

Furthermore, as a (mortgage) loan can be partially EU Taxonomy aligned, the ENGAGE Templates will be structured to clearly distinguish which fraction of the exposure is EU Taxonomy aligned.

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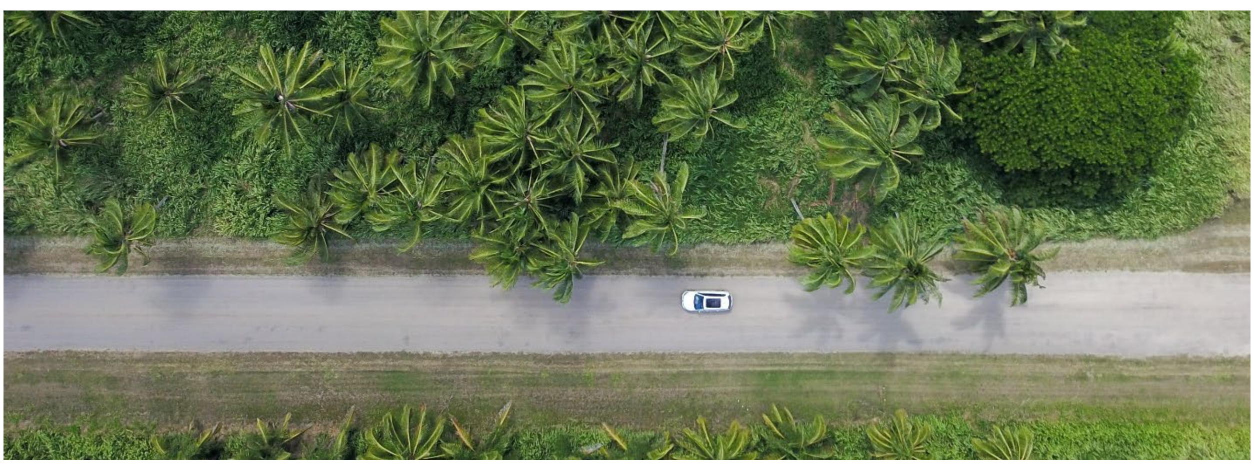
2.2 Data requirements: where to start?

As hinted in chapter 1, the starting point of ENGAGE Templates will be the Securitisation Regulation, primarily, Annexes 2 (residential real estate[20]) and 6 (consumer)[21] of the Technical Standards on Disclosure Requirements. The existing data disclosure requirements at loan level under the Securitisation Regulation framework on borrowers and underlying properties (including property value, LTV ratio, borrower credit history, loan performance and EPC class and provider, as well as EPC and EPC provider for real estate loans) will serve as the basis for the development of the ENGAGE Templates, in light of the EU Taxonomy Regulation requirements and, in particular, the requirements of the Climate Delegated Act.

The Technical Standards on Disclosure Requirements under the Securitisation Regulation will constitute the foundational building block of the ENGAGE Templates, because they have several favourable features that will contribute to their usability by the relevant stakeholders.

Four key criteria have been established to decide the starting point template upon which ENGAGE Templates will be developed:

1. Templates should be based upon common market standard (i.e., Securitisation Regulation disclosure);
2. Templates should already be widely used and applied;
3. Templates should be widely recognised by regulators, investors, rating agencies and other relevant stakeholders;
4. Templates should not be phased out in the short term.



[20] Annex 2 of the technical standards on disclosure requirements under the Securitisation Regulation prescribes the information to be made available for a non-ABCP securitisation pursuant to Article 7.1(a) of the Securitisation Regulation for loans to private households secured by residential real estate, regardless of the purpose of those loans.

[21] Annex 6 of the technical standards on disclosure requirements under the Securitisation Regulation prescribes the information to be made available for a non-ABCP securitisation pursuant to Article 7.1(a) of the Securitisation Regulation for consumer underlying exposures.

2.3 The EU Taxonomy at the core of sustainable developments

The table below summarises the key regulatory and disclosure requirements relevant for residential mortgages that will be monitored by ENGAGE.

Table 5: Key regulatory and disclosure sustainability requirements applicable to the financial sector to be monitored under ENGAGE

Regulation / Directive	Summary	Importance for Residential Real Estate Financing	Examples of Data Requirements for Residential Real Estate Compliance
EU Sustainable Finance Disclosure Regulation[22]	Requires financial market participants and financial advisers to disclose ESG-related information and integrate sustainability risks into their decision-making processes.	Aims to ensure that financial market participants and advisers consider the sustainability impact of investments, including those related to residential real estate financing. Transparency on the sustainability characteristics of investments helps investors make informed decisions.	ESG risks and opportunities, sustainability performance of the property, energy efficiency, greenhouse gas emissions, water usage, waste management, adaptation to climate change, potential impact on local community, and biodiversity.
EU Securitisation Regulation	Sets a framework for STS securitisation, promoting safe and sustainable capital markets. It outlines criteria for risk retention, due diligence, and disclosure requirements for all securitisation transactions.	Important for RMBS as a source of funding for residential real estate financing. Requires transparency and standardised reporting, making it easier for investors to assess the risks and sustainability characteristics of these investments.	Loan-level data on borrowers and underlying properties, including property value, LTV ratio, borrower credit history, loan performance, and property energy efficiency ratings.

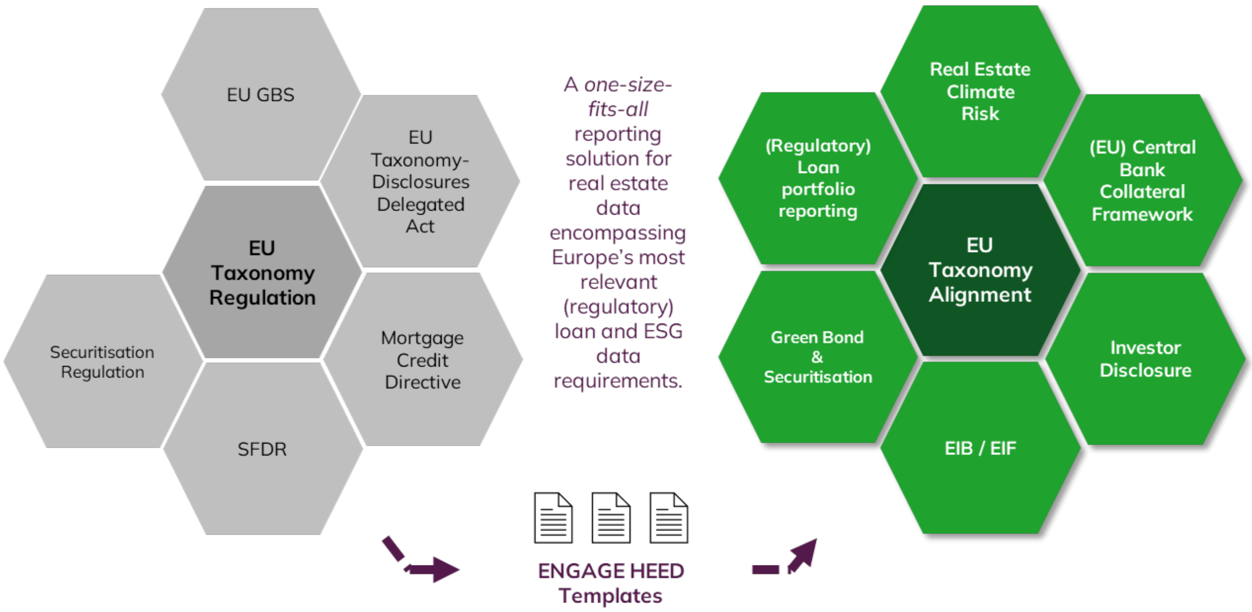
[22] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02019R2088-20200712&qid=1687083314575

EU GBS	Voluntary standards for the issuance of green bonds, aimed at financing environmentally friendly projects. GBS sets guidelines for use of proceeds, project evaluation and selection, management of proceeds, and reporting.	Encourages the issuance of green bonds to finance environmentally sustainable residential real estate projects, supporting the transition to a low-carbon economy. Increases transparency and trust in green investments.	Detailed information on green projects financed (use of proceeds), including their environmental objectives and expected outcomes. For residential real estate, data on energy efficiency, emissions reduction, renewable energy sources, and climate resilience of buildings.
Mortgage Credit Directive[23]	Aims to create a single market for mortgage loans by setting minimum standards for creditworthiness assessment, consumer protection, and information disclosure. Requires lenders to consider the borrower's ability to repay and provides protections against unfair lending practices.	Directly affects residential real estate financing by setting minimum standards for mortgage lending. Ensures responsible lending practices and consumer protection, promoting stability in the housing market.	Information on borrower's creditworthiness, including income, financial commitments, and credit history. Data on the property, including its value, location, and condition.

The EU Taxonomy Regulation sits at the core of all the above-mentioned laws. The diagram below depicts how the EU Taxonomy is the cornerstone of the ESG components included in EU financial regulations and therefore, is also the basis for sustainability reporting requirements under the different financial disclosure regimes. The EU Taxonomy will also be the first sustainable finance regulation to be analysed under ENGAGE to construct the Templates and the GIP.

[23] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02014L0017-20180101

Figure 3: Set of regulations and disclosure requirements with the EU Taxonomy at its kernel



To enable the EU Taxonomy alignment assessment, it is envisaged that ENGAGE Templates will request:

- Cadastral data: information regarding the dwellings' type, size, location, etc.;
- Data related to the energy performance of dwellings;
- Data related to renovations;
- Data related to climate risk.

In addition, data fields required by the EIB-EIF for the sustainability assessment of their respective financing programmes will be incorporated into the disclosure regime.

2.4 Developing ENGAGE Templates

The high-level approach

As mentioned in section 2.2, the ENGAGE Templates will be built upon existing reporting regimes that have been established over time. The aim is to identify the key data fields that are important to assess the energy efficiency related information of green mortgages and home renovation loans. Once the critical fields have been identified, the definitions will be harmonised with those in existing reporting templates. Finally, a standardised data template and taxonomy, with harmonised definitions and data format types, will be developed in line with current market standards.

By identifying common denominators among regulatory disclosure templates, financial institutions can simplify and streamline their reporting processes. This would reduce the time and resources required to comply with multiple regulations, allowing financing institutions to focus on their core business of lending money. Furthermore, a unified approach to disclosure would make it easier for regulators to monitor compliance and ensure that the residential real estate sector adheres to the relevant standards.

Finding common denominators among regulatory disclosure templates would also facilitate cross-border investments in residential real estate. By creating EU-wide mortgages and home renovation loans disclosure standards and promoting consistency in reporting requirements, investor confidence in sustainable financial products is expected to grow. This would ultimately increase the flow of capital and contribute to the growth of sustainable real estate investments EU-wide.

Dovetailing data requirements not only simplifies reporting, but also improves the quality and consistency of the data provided. By creating a more coherent and standardised framework for data collection and reporting, companies can ensure that the information they provide is accurate, reliable, and easily comparable across different regulations and jurisdictions.

Streamlined data requirements for regulatory reporting also reduces the burden on regulators to monitor compliance and enforce the relevant rules and regulations. It also enables market participants to have a clearer understanding of their obligations, reducing the risk of non-compliance and associated penalties.

Template Structuring Process

The ENGAGE Templates development process is listed below:

- Analysis of disclosure obligations for green financial products under different pieces of legislation (Securitisation Regulation, EU Taxonomy, amongst others);
- Analysis of different -existing and upcoming- templates (ESMA);
- Reconciliation between disclosure obligations and templates' applications by mapping the fields with the information to be provided;
- Identification of the key data fields for green mortgages and home renovation loans;
- Harmonisation of definitions;
- Choice of the most appropriate data formats;
- Creation of standardised data templates.

2.5 The data quality framework

Following the finalisation of the ENGAGE Templates, the focus will be shifted to the implementation of the data quality framework.

The International Science Council (ISC) published a paper on the *The Challenges of Data Quality and Data Quality Assessment in the Big Data Era* in the Data Science Journal in 2015[24]. Their study describes, amongst others, the multiple dimensions of data quality. The table below provides an overview of these dimensions.

Table 6: Dimensions, elements and indicators of data quality

Dimensions	Elements	Indicators
1) Availability	1) Accessibility	Whether a data access interface is provided
		Data can easily be made public or purchased
	2) Timeliness	Within a given time, whether the data is made available on time
2) Usability	1) Credibility	Data comes from specialised organisations of a country, field, or industry
		Experts or specialists regularly audit and check the correctness of the data content
		Data exists in the range of known or acceptable values
3) Reliability	1) Accuracy	Data provided is accurate
		Data representation (or value) well reflects the true state of the source information
		Information (data) representation will not cause ambiguity
	2) Consistency	After data has been processed, their concepts, value domains, and formats still match as before processing
		During a certain time, data remains consistent and verifiable
		Data and the data from other data sources are consistent or verifiable
	3) Integrity	Data format is clear and meets the criteria
		Data is consistent with structural integrity
		Data is consistent with content integrity
	4)Completeness	Whether the deficiency of a component will impact use of the data for data with multi-components
		Whether the deficiency of a component will impact data accuracy and integrity
4) Relevance	1) Fitness	The data collected does not completely match the theme, but they expound one aspect
		Most datasets retrieved are within the retrieval theme users need
		Information theme provided matches with users' retrieval theme

[24] *Cai, L. and Zhu, Y., 2015. The Challenges of Data Quality and Data Quality Assessment in the Big Data Era. Data Science Journal, 14, p.2. DOI*

5) Presentation Quality	1) Readability	Data (content, format, etc.) is clear and understandable
		It is easy to judge that the data provided meet needs
		Data description, classification, and coding content satisfy specification and are easy to understand

Some of the above parameters will be included in the ENGAGE data quality framework, in particular, the completeness, consistency, and timeliness:

- Completeness: for this purpose, a standardised set of "No Data" (ND) options will be developed which would cater for the unavailability of the information. The set of ND options would explain the reason for the unavailability of information in a standardised manner. This is in line with existing reporting practices under the Securitisation Regulation.

- Consistency: consistency can be verified by comparing the information provided across different data fields of a single record (inter-field consistency). Alternatively, information across different data submissions could be compared. Finally, benchmarking across similar datasets would be another way to verify the consistency of the data.

- Timeliness: there are several ways to verify the timeliness of the information depending on the reporting requirements. In the case of the disclosure requirements under the Securitisation Regulation, the information must be made available on a quarterly basis within one month after the interest payment, and the data cut-off date should not be older than two months prior to the submission date.

To verify data consistency, completeness, and timeliness, ENGAGE will also refer to existing technical standards for the various reporting requirements and will then create the *ad hoc* processes in accordance with the respective regulations. These processes will eventually feed into the flow of data transferred to the GIP.

2.6 The Challenges: data availability across Europe

The functioning of residential mortgage markets differs greatly amongst EU Member States, due to different mortgage/loan laws, regulations and standards, as well as divergent interpretations of common laws and regulations by national and/or regional courts and authorities. The same lack of uniform rules and interpretations applies to building codes and energy performance methodologies across Europe.

As a result, the availability of property data is also inconsistent, even when analysing differences that do not take any ESG components into account. The creation of disclosure templates, with intended EU-wide applicability is, therefore, an ambitious challenge.

The ENGAGE project aims to overcome this challenge by observing national particularities in the ENGAGE Templates, with an initial focus on the two jurisdictions where the two piloting institutions of ENGAGE Consortium are located. In this vein, the role of the pilots will be crucial in testing the usability and suitability of the ENGAGE Templates within their markets.

In addition, the ENGAGE Consortium is involving key stakeholders in the development of the ENGAGE Templates, both at European and national level, so as to successfully incorporate relevant, national particularities into the ENGAGE Templates.

2.7 Proportionality as a principle of ENGAGE Templates

To ensure the smooth implementation of the ENGAGE Templates, especially given the data availability challenge described in section 2.6 and the currently unclear interpretation of the EU Taxonomy, the ENGAGE Consortium will apply the principle of proportionality to the ENGAGE Templates development process. This translates into the two following circumstances:

1. The ENGAGE Templates will contemplate some mandatory and some optional data fields, as well as static and dynamic data fields, in accordance with the relevance of the respective field for the purpose of the proposed sustainability check;
2. A phased approach is foreseen for the implementation of the ENGAGE Templates as a voluntary disclosure framework first.

3. The Green Investment Portal (GIP)

To address the growing need for comprehensive and accessible information on energy efficient mortgages, ENGAGE Consortium is creating the GIP, which aims to become:

- a centralised repository for ESG information from financial institutions;
- a tool to assess the alignment of real estate financing activities with the EU Taxonomy Regulation;
- the point of reference for data users, such as investors, who will be able to perform their due diligence on the sustainability level of planned investments.

It will become a central access point for all stakeholders, containing comprehensive and up-to-date data, allowing both investors and financial institutions to make informed decisions, strategise effectively, and gain a competitive edge.

3.1 Why is the GIP needed?

A portal specifically dedicated to energy efficiency mortgages and home renovation loans can be a useful tool to address the data-related challenges faced in this sector and unlock significant added value for all stakeholders involved. The GIP will address several challenges:

- Lack of data: one of the primary challenges in the energy efficient mortgage market is the scarcity of easily accessible and standardised data. This information gap poses obstacles for borrowers, lenders, and investors seeking to make informed decisions on sustainable real estate investments. The GIP will act as a centralised hub, offering comprehensive and up-to-date information about energy efficient mortgages and loans, thus empowering stakeholders with the knowledge needed to navigate this emerging financial market effectively.

- Complex evaluation process: the evaluation process for energy efficient mortgages and home renovation loans often involves numerous factors, such as analysing energy efficiency classes and methodologies, climate risk and vulnerability assessments, and documentation reviews. The criteria often vary from region to region, making it challenging for lenders and borrowers to streamline the process. By providing a centralised platform for data aggregation and comparison, the GIP will simplify the evaluation process, ensuring transparency and facilitating informed decision-making for all parties involved.

- Limited product awareness: many potential borrowers and lenders remain unaware of the benefits and opportunities associated with energy efficient mortgages and home renovation loans. The GIP can play a crucial role in raising awareness by highlighting the environmental, financial, and social advantages of investing in energy efficient mortgages and renovation projects. This increased market visibility can attract more participants, thereby stimulating the growth of the green mortgage sector overall.

- Information gaps: most citizens are not aware of the regulatory developments and opportunities to reduce energy poverty with public and private investments.

As we progress towards a more sustainable future, the GIP can become a crucial tool in achieving a greener, more sustainable building stock in Europe. Moreover, the transparency, accountability, and data-driven insights offered by the GIP will foster sustainable lending practices and drive the growth of energy efficiency investments.

By tackling the above challenges, the GIP aims to deliver the following objectives:

- Enhanced access to sustainable financing by bridging the gap between lenders and borrowers, expanding access to green financing options, and facilitating structured finance transactions. The so-called “greenium”, the cheaper funding rate associated with energy efficient investments, can be passed onto retail consumers.

- Transparency and accountability by providing a centralised platform for data collection and dissemination. The GIP will enable relevant information to be readily available to all stakeholders, including regulators, and will foster accountability among lenders, borrowers, and investors, encouraging responsible lending and investment practices and facilitating the tracking of environmental impact over time.

3.2 High level functional requirements of the GIP

Functional requirements define the way in which the GIP operates.

The following core functional requirements will apply to the GIP:

Table 7: Core functional requirements of the GIP

No.	Core Functional Requirements	Description
1.	*User authentication & authorisation*	Implement a secure login system, ideally using multi-factor authentication. Assign user roles such as banks, administrators, and stakeholders, each with specific access privileges, ensuring only authorised users can access and modify the data.
2.	*Data input and validation*	Design an intuitive online data-loading interface for banks to upload mortgage information, including borrower details, property information, energy efficiency measures, and mortgage terms. Implement data validation checks to prevent incorrect, incomplete, or duplicate data entries.
3.	*Data storage and management*	Select a secure, scalable, and reliable data storage solution, such as a cloud-based database. Implement data backup and recovery procedures to ensure data is protected

		against loss and maintain proper version control to track changes over time.
4.	*Search and filtering*	Create a user-friendly search system that allows for the searching, sorting, and filtering of mortgage data based on various criteria, making it easier to find relevant information.

EDW and HYP have been delivering reliable technology to banks in Europe for 10 and 20 years, respectively. In terms of basic functionality, the GIP will not deviate too much from the existing technologies already in place but will adapt from a financial and risk-based data regulatory scope to a sustainability and climate related data scope.

3.3 High-level non-functional requirements of the GIP

Non-functional requirements define how the system will operate. They set the performance standards and quality attributes of a software, e.g., system usability, effectiveness, security, scalability, etc.

Amongst others, the following non-functional requirements will apply to the GIP:

Table 8: Core non-functional requirements of the GIP

No.	Core Non-Functional Requirements	Description
1.	*Data privacy and security*	Ensure compliance with data protection regulations, such as GDPR, and safeguard user privacy by implementing encryption, access controls, and regular security audits. Monitor and address potential vulnerabilities to protect the system against unauthorised access or data breaches.
2.	*User support and documentation*	Develop comprehensive user guides, FAQs, and other resources to help users navigate the GIP.
3.	*System scalability and performance*	Design the GIP to handle increasing data volumes and user traffic, ensuring the system remains responsive even under high load. Optimise performance through efficient code, caching, and load balancing to ensure a smooth and efficient user experience.
4.	*Regular updates and maintenance*	Keep the GIP up to date with the latest industry standards, regulations, and best practices. Perform regular maintenance to fix bugs, improve functionality, and enhance user experience, while proactively seeking user feedback for continuous improvement.
5	*Recordkeeping*	Store data received from lending institutions for the duration permitted by applicable laws.
6	*Auditability*	Log required events for auditing purposes and generate reports (restricted to authorised users) about user activity within the GIP.

3.4 User stories

Functional user stories are essential in the software development process for several reasons. They provide a clear and concise way of capturing and communicating the needs and expectations of end-users, ensuring that the final product is relevant, usable, and valuable to the target audience.

Below we list some key reasons why functional user stories are important:

- Enhanced communication and collaboration: user stories create a shared understanding of requirements among stakeholders, developers, designers, and testers, fostering better communication and collaboration throughout the development process.

- User-centered design: by focusing on the needs and experiences of end-users, functional user stories encourage a user-friendly design approach. This ensures that the final product is tailored to the users' preferences, leading to greater satisfaction and adoption.

- Prioritisation and scoping the development of features and functionalities based on their importance and relevance to the users. This allows for efficient allocation of resources and ensures that the most valuable features are developed and delivered first.

- Flexibility and adaptability to allow for adjustments and changes as the project progresses. This adaptability enables the development team to respond to changing user needs or market conditions, ensuring that the final product remains relevant and valuable.

- Simplified testing and validation to ensure that the product meets user expectations. This helps to improve product quality and reduce the likelihood of defects or issues.

In addition, user stories cater for improved project management by breaking down complex requirements into smaller, manageable user stories so that the development team can better track and monitor progress and maintain the project schedule.

Eight use cases for the three core stakeholders (institutional investors, mortgage originators and regulators) have been identified in the table below.

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Table 9: Use cases of the GIP

No.	User Role	Functional User Story
1	Lender	*As an originator, I want to securely upload energy-efficient mortgage data to share it with institutional investors and regulators.*
2	Lender	*As an originator, I want to easily search and filter existing energy-efficient mortgages to analyse market trends and improve my own offerings.*
3	Lender	*As an originator, I want to receive notifications and updates on relevant industry standards and regulations to remain compliant and up to date.*
4	Institutional Investor	*As an institutional investor, I want to search and filter energy-efficient mortgages based on my investment criteria to identify potential investment targets.*
5	Institutional Investor	*As an institutional investor, I want to receive updates on relevant industry standards and regulations to ensure my investments remain compliant.*
6	Regulator	*As a regulator, I want to monitor energy-efficient mortgage data to assess market trends and compliance with relevant standards and regulations.*
7	Regulator	*As a regulator, I want to search and filter energy-efficient mortgages based on various criteria to identify potential compliance issues or areas of concern.*
8	Regulator	*As a regulator, I want to receive notifications and updates on mortgage originators and institutional investors to effectively monitor the market.*

3.5 Development planning

EDW and HYP already have working architectures and software platforms in place and ENGAGE plans to leverage this expertise as much as possible during the development phase.

A phased approach is essential during the development of the GIP to ensure that the most critical features are implemented first and that the system remains manageable throughout the development process.

A high-level plan is detailed below:

- Phase 1: Planning and requirements analysis
    - Define the project scope and objectives.
    - Conduct market research and gather stakeholder requirements.
    - Identify key features and functionalities.
    - Develop a project timeline and allocate resources.
- Phase 2: Design and architecture
    - Design the system architecture, including front-end, back-end, and database components.
    - Create wireframes and mock-ups for the user interface.
    - Develop a detailed technical specification document.
    - Plan data privacy and security measures.
- Phase 3: Core functionality development
    - Implement user authentication and authorisation.
    - Develop data input and validation features.
    - Set up the data storage and management system.
    - Build the search and filtering functionality.
    - Develop basic data analytics and reporting tools.
- Phase 4: Advanced functionality development
    - Enhance data analytics and reporting tools.
    - Implement the API integration for third-party developers.
    - Improve system scalability and performance.
    - Incorporate user support and documentation features.
- Phase 5: Testing and quality assurance
    - Conduct unit, integration, and system testing.
    - Perform security audits and vulnerability assessments.
    - Address any issues or bugs discovered during testing.
    - Validate the system against the project requirements.
- Phase 6: Deployment and user onboarding
    - Deploy the GIP on the production environment.
    - Create user guides, FAQs, and other documentation.
    - Train users and provide ongoing support during the initial launch phase.
- Phase 7: Ongoing maintenance and updates
    - Monitor and analyse user feedback.
    - Perform regular updates to incorporate new industry standards, regulations, and best practices.
    - Address any bugs, security vulnerabilities, or performance issues.
    - Continuously improve the GIP based on user feedback and changing market needs.

4. Pilot Phase

4.1 Introduction

The development and implementation of the ENGAGE Templates and GIP will require significant investments in time, resources, and expertise. To maximise the chances of success and ensure the product is fit for purpose, the pilot phase will be a key component of the project. In this section, the usefulness and need for the pilot phase will be explored.

Piloting will initially be carried out with the two ENGAGE Consortium partners WOO and UCI. Later, piloting opportunities will be opened to all reporting entities interested in testing the ENGAGE Templates and the GIP.

4.2 Why do we need the pilot phase?

The pilot program will allow financial institutions to test and validate the GIP's features and functionalities in a real-world environment to ensure the GIP meets user expectations and addresses their specific needs and requirements. During the pilot phase, users may encounter issues or challenges that were not anticipated during the development process and by identifying these early on, they can be addressed before the GIP is rolled out to a wider audience, ensuring a smoother and more successful launch.

By testing the GIP with a limited number of users, the project team can assess its performance and scalability to help identify potential bottlenecks or performance issues. The involvement of multiple financial institutions in the pilot program will help build trust and buy-in among further potential users.

4.3 The devil is in the detail

Analysing financial and energy performance data in detail is essential for several reasons. Detailed data analysis can provide valuable insights, drive informed decision-making, and contribute to the overall success of energy-efficient mandates. The pilot phase will provide an opportunity to analyse the financial and energy performance data to be furnished by the two pilot institutions and thus, to test the design of the ENGAGE Templates at an early stage of the project.

Some of the key reasons why detailed analysis is important:

- <u>Identifying trends and patterns</u>: by monitoring financial and energy performance data in detail, stakeholders can identify trends and patterns that may not be immediately evident. This can help uncover new opportunities, potential risks, and areas requiring improvement or intervention.

- Informed decision-making: detailed data analysis enables stakeholders, such as financial institutions, investors, and regulators, to make well-informed decisions based on accurate and up-to-date information. This can lead to better investment strategies, more effective policies, and improved energy efficiency measures.

- Understand the details of the EU Taxonomy: additional data elements are needed to comply with EU Taxonomy disclosures. During the pilot phase we will closely monitor availability, completeness and quality of sustainability- related data for different financial institutions.

- Understand *non*-alignment with the EU Taxonomy: it is of particular added value to have detailed insights into mortgages and home renovation loans that are not EU Taxonomy aligned. The GIP will help understand why these loans are not aligned and how they could potentially become aligned in other cases. This point is of vital importance due to the upcoming GAR reporting obligations under the Disclosures Delegated Act. For financial institutions the GAR has the potential to become a key performance metric of the portfolio.

After uploading data to the GIP insights from the EU Taxonomy alignment test will be provided.

4.4 Consumer involvement

During the pilot phase, UCI will create an agency (the “one-stop-shop”) that citizens will be invited to visit. The one-stop-shop approach intends to address the complexity and challenges of renovation works by facilitating access to a full range of services. These services range from the design of the whole renovation and creation of an *ad-hoc* financial plan to the coordination of the process and the provision of (or the facilitation of access to) adequate and affordable funding or financing schemes. This full service provided by the “one-stop-shop” aims to ensure well-informed and evidence-based decisions by consumers, as well as to streamline the retrofit process by accompanying and unburdening consumers. Besides this, it also enhances business opportunities for local contractors and companies.

While the primary users of the GIP are mortgage originators, institutional investors, and regulators, there are several indirect benefits for homeowners & (mortgage) consumers of the pilot institutions using the GIP. These benefits stem from the improved efficiency, transparency (in terms of data requirements), and decision-making capabilities that the GIP will provide to the pilot institutions and other stakeholders.

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Here are some key indirect benefits for homeowners:

- Access to better real estate lending products: as pilot lenders gain access to more data and insights about energy-efficient loans they may subsequently develop more competitive and attractive mortgage products for homeowners. This may result in better interest rates, more flexible terms, and improved incentives for energy-efficient home improvements.

- Increased awareness about energy efficiency: the GIP can raise awareness about the benefits of energy efficiency among homeowners by promoting the adoption of energy-efficient loans and showcasing their advantages. This can encourage more homeowners to invest in energy-efficient improvements and contribute to a more sustainable housing market.

- Improved financial and environmental outcomes: by promoting the adoption of energy-efficient loans, the GIP can help homeowners achieve better financial and environmental outcomes. This may include reduced energy costs, increased home values, and lower greenhouse gas emissions.

- Support for policy and regulatory compliance: the GIP can help pilot lenders and other stakeholders better understand and comply with relevant energy efficiency policies and regulations. In terms of consumer protection, this can indirectly benefit homeowners by ensuring that real estate lending products and services are in line with the latest standards and best practices.

- Encouraging innovation and best practices: by providing pilot lenders with access to data and insights, the GIP can promote innovation and the sharing of best practices in the energy-efficient real estate lending market. This can lead to the development of new products, services, and technologies that ultimately benefit homeowners.

In summary, the use of the GIP by pilot institutions and investors can indirectly benefit homeowners by promoting the development of better real estate lending products, streamlining the mortgage approval process, increasing market transparency, raising awareness about energy efficiency, and encouraging innovation and best practices. These benefits can ultimately lead to improved financial and environmental outcomes for homeowners.

4.5 Funding engagement

A successful pilot phase is crucial to attract institutional investors to the GIP. By demonstrating the GIP's value, functionality, and potential benefits, the pilot phase can enhance trust and confidence among potential investors, encouraging them to adopt and utilise the GIP in their investment decisions.

Some key aspects of the pilot phase which could attract institutional investors include:

- Proof of concept: the pilot phase will act as a proof of concept, showcasing the GIP's capabilities, features, and real-world applicability. By allowing lending institutions and investors to test the GIP in a controlled environment, the pilot phase helps validate the GIP's functionality and builds credibility among potential users.

- User feedback and improvements: the pilot phase will allow institutional investors to provide feedback on the GIP's features, usability, and overall experience. By incorporating this feedback into the development process, the ENGAGE project team can refine and enhance the GIP, ensuring that it is tailored to the needs and preferences of its target audience.

- Performance and scalability testing: during the pilot phase, institutional investors can help test the GIP's performance and scalability under real-world conditions. By demonstrating that the GIP can handle a significant volume of data and transactions, the pilot can reassure investors that the system is reliable, secure, and capable of meeting their needs.

- Demonstrating benefits and value: the pilot phase provides an opportunity for institutional investors to experience the GIP's benefits and value firsthand. By showcasing the GIP's data analysis, reporting, and decision-making capabilities, the pilot phase can help investors understand how the GIP can enhance their investment strategies and performance.

A well-executed pilot phase is essential for attracting investors to a financial data GIP. By demonstrating the GIP's value, addressing potential concerns, and incorporating user feedback, the ENGAGE pilot phase aims to foster trust and confidence among lending institutions and investors, encouraging them to adopt and utilise the GIP for their energy-efficient mortgage and renovation loan disclosures and investments, respectively.

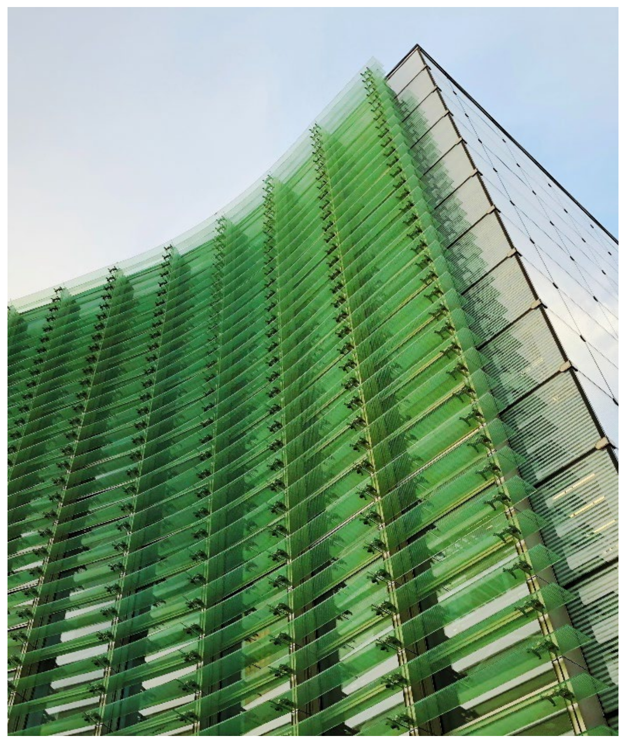
5. Key Conditions

5.1 An introduction to the GDPR

In order to reach the abovementioned goals, a number of legal conditions must be met, from a data protection and privacy perspective. Accordingly, attention shall be paid to the European GDPR and individual EU Member States legislation deriving from the adaptation to their national legal system of the reglementary framework (collectively, "Privacy Laws").

Data protection is a complex subject, permeated by some crucial concepts: personal data, data processing, purposes, data controller and data processor, legal basis, and so on. Under ENGAGE some of these concepts shall be further addressed and analysed to ensure the most adequate interpretation, according to the applicable Privacy Laws, of the legal rules impacting the project.

One of the necessary requirements for a data controller to process personal data is the identification of an appropriate legal basis (also known as the fairness principle).



Article 6 of the GDPR sets forth a list of such bases: consent, execution of a contract, legal obligations, vital interests, performance of a task carried out in the public interest, and legitimate interest.

Among such bases, some are more recurrent (vital interest are relegated to situations where a human life is in danger) or more easily identifiable (e.g., where a law clearly and precisely states an obligation upon an entity to respect which a determined processing operation is needed, it is likely that the correspondent legal basis would be such legal obligation) than others.

The Consortium will verify the data protection perimeter of the project and identify the proper legal basis for the processing of personal data connected to the energy efficiency of mortgage and home renovations loans.

5.2 Data and privacy

In the context of privacy laws, the concepts of data controller and data processor play a crucial role, since they determine who shall be responsible for compliance with different data protection rules, and how data subjects can exercise their rights in practice.

The parties involved in the ENGAGE project may therefore qualify as autonomous data controllers but also, through a data processing agreement, as data controllers and data processors. Therefore, in many cases, the allocation of roles should usually stem from an analysis of the factual elements relating to the contractor and the circumstances of the case. In addition, the Article 29 Working Party and European Data Protection Board issued guidelines that define the concepts of data controller and data processor in order to provide clarifications and concrete examples with respect to these roles.

The controller, as set out by Article 4, paragraph 7, of the GDPR, is an entity that determines the main elements of the processing and determines the purposes and means of the processing, *i.e.,* the *why* and *how* of the data processing.

The processing of loan related personal data is a key factor for the achievement of a successful result of the pilot phase. As such, the ENGAGE Consortium has agreed upon UCI and WOO being data controllers and EDW and HYP as data processors during the pilot phase.

5.3 Data and liability

The concepts of data controller and data processor are functional concepts since they determine who shall be responsible for compliance with different data protection rules and how data subjects can exercise their rights in practice.

The accountability principle, explicitly introduced by Article 5 of the GDPR, states that the data controller shall implement appropriate technical and organisational measures to ensure and demonstrate that processing is performed in accordance with the GDPR. Such measures shall be reviewed and updated if necessary. The accountability principle is also reflected in Article 28 of the GDPR, which lays down the controller's obligations when engaging a data processor.

Data controllers should also ensure that the practical measures implemented to comply with data protection principles are effective. There are different ways to assess the effectiveness (or ineffectiveness) of the measures, including monitoring, internal and external audits, etc.

The accountability principle is directly addressed to the controller. However, some of the more specific rules are addressed to both controllers and processors, such as the rules on supervisory authorities' powers in Article 58 of the GDPR. Both controllers and processors can be fined in case of non-compliance with the obligations of the GDPR that are relevant to them.

In addition, both the controller and processor are accountable to supervisory authorities by virtue of the obligation to maintain and provide appropriate documentation upon request and to cooperate in case of an investigation. At the same time, it should be recalled that processors must always comply with, and act only on, instructions from the controller.

5.4 The GDPR across Europe

Before the GDPR, a directive regulated the processing of personal data at EU level. In 2012, the Commission's choice to adopt a Regulation, in lieu of a directive, was mainly aimed at preventing any further rule fragmentation on the circulation and the protection of personal data within the EU. Five years after the full application of the GDPR, doubts arose as to the actual effectiveness of this regulatory solution, at least in terms of tackling such fragmentation.

Different legal frameworks, legal cultures, and practice exacerbate the differences in some fields among Member States, whose most influential voices, from a privacy standpoint, are generally their Data Protection Authorities (i.e., the authorities in charge of monitoring the correct application of Privacy Laws in each Member State, enforcing it, and creating awareness among the civil society).

The European Data Protection Board, an organism whose main objective is to guarantee a consistent application of GPDR, has tried to address at least some of these discrepancies, but there is still a long way to go.

With regards to the fields of interest for the ENGAGE project, a potential conflict appears to arise with regards to the identification of the most appropriate legal basis to process the energy performance information related to loan applicants by banks and mortgage lenders.

At this stage of the project analysis, legitimate interest has been identified as the most suitable among the legal bases. However, different legal approaches at national level may impact this assessment. This circumstance will be permanently observed in order to achieve a consistent development of ENGAGE in each EU country.

5.5 Ethics by design

The objective of "ethics by design" is to integrate ethical principles into the project and technology development process, ensuring that ethical concerns are addressed as early as possible and closely monitored throughout research activities. It explicitly defines specific actions that can be taken and applied to any development methodology, such as AGILE, V-Method, or CRISP-DM. However, it is important to customise the approach according to the type of research being conducted, considering that ethical risks may differ between the research phase and the deployment or implementation phases.

Implementing the ethics by design approach does not, however, exclude the need for additional measures to ensure adherence to all major AI ethics principles and compliance with the EU legal framework. This is essential to guarantee complete ethical compliance and the fulfillment of ethical requirements.

Ethical requirements represent the system's characteristics based on ethical principles. While many of these requirements are supported by legal obligations, achieving ethical compliance goes beyond mere adherence to legal requirements alone. Ethics focuses on safeguarding individual rights, such as freedom and privacy, promoting equality and fairness, preventing harm, and enhancing individual well-being. It also strives to contribute to the creation of a better and more sustainable society, often anticipating solutions that eventually become legal requirements.

There are six general ethical principles in the ENGAGE project that will be considered within the design of the ENGAGE Templates and GIP, as enshrined in the Charter of Fundamental Rights of the European Union (EU Charter), and in relevant international human rights law:

1. Respect for Human Agency: the autonomy, dignity, and freedom of human beings should be respected, allowing them to make their own decisions and take their own actions. This principle recognises fundamental human rights and values the ability of individuals to exercise their agency.

2. Privacy and Data Governance: the right to privacy and data protection must be upheld at all times. Safeguarding personal information and ensuring responsible handling of data are essential aspects of ethical considerations in AI.

3. Fairness: equal rights and opportunities should be provided to all individuals, and they should not be unjustifiably advantaged or disadvantaged. Fairness is a crucial principle that promotes equitable treatment and prevents discrimination.

4. Individual, Social, and Environmental Well-being: AI systems should contribute to the well-being of individuals, society, and the environment, without causing harm. This principle emphasizes the importance of considering the broader impact of AI technologies and ensuring their positive influence on various aspects of life.

5. Transparency: the purpose, inputs, and operations of AI programs should be understandable and accessible to stakeholders. Transparency promotes openness and clarity, enabling users and affected parties to comprehend how AI systems function and make informed decisions.

6. Accountability and Oversight: humans should have the ability to comprehend, supervise, and control the design and operation of AI-based systems. The actors involved in the development or operation of AI applications should assume responsibility for the functioning of these systems and the resulting consequences. Accountability and oversight ensure that ethical considerations are addressed and potential risks are mitigated.

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6. Conclusion

The steps toward the creation of the ENGAGE standardised and harmonised sustainability disclosure and data availability framework are:

a) The development of the ENGAGE Harmonised Energy Efficiency Disclosure ( ) Templates. The Templates will build upon the ESMA templates for residential real estate mortgages and consumer loans and will add sustainability-related data fields based on the criteria required for an economic activity to be qualified as EU Taxonomy-aligned. The ENGAGE Templates will also include the fields requested by certain institutions and authorities (e.g., EBA, EIB-EIF, ECB) for different purposes, therefore playing the role of a one-size-fits-all reporting solution. The first version of the ENGAGE Templates will be made publicly available in July 2023 as an exposure draft to collect feedback from the industry and relevant stakeholders.

b) The setup of the GIP as a technical infrastructure integrating the ENGAGE Templates and a range of data quality rules to verify the accuracy of the data provided. The GIP will enable an EU Taxonomy alignment check and the production of an investor report on the alignment of loans with the EU Taxonomy. Later on, preparations will begin on the data quality framework and the software design for the GIP.

c) The piloting of the ENGAGE Templates and the GIP. After the end of the feedback period (August 2023), the ENGAGE Templates will be tested by selected entities, first and foremost by UCI and WOO as pilots of ENGAGE project, plus any other interested parties. At a later stage, the data quality rules and the GIP IT system will also be tested by lending institutions, as well as by investors.

The ENGAGE roadmap designed by the ENGAGE Consortium strives to substantially contribute to the EU Green Deal and EU sustainability policies related to activating ESG investments.

While the plan is ambitious, the firm commitment and technical capacity of ENGAGE Consortium partners indicate the path for the implementation of the project. This will streamline the sustainability disclosures reporting regime in the real estate lending market and drive a positive impact on sustainability-related transparency across Europe.

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