Aligning Real Estate Sustainability Indicators:

Leveraging existing ESG legislation to drive sustainable investment and reduce the reporting burden in the European market

Endorsed by

Acknowledgements

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During the development of the ARESI proposal and white paper, feedback from the 30+ members of the ARESI working group was provided in addition to those who helped pilot the ARESI proposal and the 21 organisations that responded to the consultation. We are grateful for individual and organisational contributions of all of those that have provided input.

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Executive Summary

The Aligning Real Estate Sustainability Indicators (ARESI) white paper aims to address existing ambiguities in real estate Key Performance Indicators (KPIs) within the European legislative framework, in order to unlock investment and drive decarbonisation of real estate.

Identifying ten key indicators across key European legislation – EU Taxonomy, EU Sustainable Finance Disclosure Regulation (SFDR) and EU Energy Performance of Buildings Directive - used by financial institutions, it looks to establish clear definitions, calculations and data hierarchies. It aims to facilitate a more harmonised and practical application of these indicators, leading to more informed decision making, reducing hesitation in capital raising and investment decision making, with investors and lenders comfortable that indicators are recognised and calculated consistently.

This proposal is a product of extensive consultation and input from the working group, developed with the best intentions to enhance clarity and consistency while remaining adaptable for further development.

ARESI represents a crucial step toward greater transparency and consistency in real estate sustainability reporting. While it does not claim to be a final solution, it is a practical and necessary initiative designed to support industry alignment and progress. This is an additive framework, one that will evolve with ongoing discussion and input.

As a next step ARESI will engage with stakeholders encouraging them to align to the ARESI proposal and with regulators on appropriate and ambitious sustainability regulation.

We actively welcome feedback, collaboration, and engagement with stakeholders to refine this approach and shape the next phase of its development. We look forward to continued dialogue and collaboration to refine and expand upon this work.

> *"ARESI is a decisive step forward, providing a structured approach to streamline reporting, enhance comparability, and eliminate inefficiencies. Through our pilot on recent acquisitions, we have witnessed firsthand how a harmonised framework for key climate transition indicators can drive more informed investment decision.*
>
> *Crucially, this is about more than just data – it's about enabling the integration of climate transition valuation into property investment ensuring that all stakeholders operate with clarity and comparability around the same metrics."*
>
> Joey Aoun, Net Zero & Sustainability Lead – Savills Investment Management

Background and introduction

It is estimated that $6 trillion of climate finance is needed annually between now and 2030 to deliver net zero ambitions.[1] Globally, deep decarbonisation of buildings requires significant investment, $600 billion annually from now to 2050.[2] To bridge the gap, private finance needs to rapidly scale, and barriers need to be removed to make this as easy as possible.

In real estate, capital providers rely on consistent and comparable performance reporting to assess risk, allocate capital efficiently, and ensure that investments and lending align with sustainability goals. Without clear and standardised disclosures recognised by financial regulators, uncertainty increases, acting as a barrier to investment and financing, and slowing progress on the transition.

Historically, performance reporting for real estate assets has been voluntary and market-driven with participation in initiatives like GRESB[3] and the European Association for Investors in Non-Listed Real Estate Vehicles (INREV) ESG Standard Data Delivery Sheet (ESG SDDS).[4] Recently, we have seen the introduction of mandatory sustainability regulations such as the Sustainable Finance Disclosure Regulation (SFDR) and EU Taxonomy in the EU, and Sustainability Disclosure Requirements (SDR) in the UK. These regulations now provide mandatory indicators for assessing sustainability performance. The proliferation of such frameworks has increased the ambiguity of sustainability KPIs and created additional reporting burden on financial institutions, increasing uncertainty in investment decision making and diverting attention and resources from implementing change.

Market participants are now expected to report against multiple voluntary and regulatory indicators, with limited harmonisation across the indicators, their assumptions and calculation. Despite efforts by some regulators to clarify their requirements, many remain ambiguous. This creates a false impression of comparability between disclosures.

More than 200 financial sector actors signed a statement on the EU's Omnibus proposals,[5] supporting the overall objective of simplifying and improving the coherence of the EU sustainable finance framework. The statement called for a "more effective approach would be to focus on streamlining the technical standards and provide clear implementation guidance."

The white paper therefore provides technical suggestion for improving real estate metrics. An example of the ambiguity of real estate metrics can be seen in the fact that no single measurement of floor area is used consistently across real estate organisations, with a quarter of organisations polled using a combination of definitions, with some using as many as four. With floor area being a common denominator, these decisions can dramatically impact energy use intensity values that are crucial for risk management and decision-making.

The lack of consistent indicators creates confusion, increases reporting burden, and impacts investor's ability to make informed sustainability decisions. This creates nervousness around greenwashing challenges and ultimately erodes confidence in sustainable products, restricting sustainable finance and creating bottlenecks for financing of and investment into climate solutions.[6]

In the face of these ambiguities, and the pace of regulatory change, there is an opportunity to create a market-led interim solution to align assumptions and approaches across key indicators. With this alignment, the market can begin to compete, transact and invest with greater confidence **without needing to create anything new**.

1 https://www.climatepolicyinitiative.org/wp-content/uploads/2023/09/How-big-is-the-Net-Zero-financing-gap-2023.pdf
2 Roadmap, 2022 - Figure 22: Retrofits and heat pumps drive investments needs in buildings in IEA NZE 2050 scenario
3 https://www.gresb.com/nl-en/
4 https://www.inrev.org/esg-sdds
5 https://www.iigcc.org/media-centre/investors-warn-omnibus-package-could-weaken-eu-sustainability-disclosures-harming-investment-and-economic-competitiveness
6 As noted by respondents to the ARESI consultation

The ARESI Working Group

To address these challenges, an industry-convened working group ***Aligning Real Estate Sustainability Indicators (ARESI)*** was created. The group includes industry groups IIGCC, AREF, INREV, EPRA, RICS, BBP, B4NZ, GFI, CREFC Europe, CRREM, SMI, ULI, WBCSD, WGBC and investment managers, academia, and banks.[7] **This group leverages existing resources and legislation to solve today's challenges** and provide clarity. **It does not look to create new standards or re-invent the wheel and create further market fragmentation**. We intend for these interim findings to be adopted in formal locations over time.

The objectives of the ARESI group are to:

- Provide a neutral forum for discussing industry alignment in real estate sustainability investment indicators;
- Develop and agree on temporary solutions to address current ambiguities, enabling market harmonisation, with a long-term goal of addressing these ambiguities in legislation and key disclosure frameworks; and
- Promote the consistent calculation and disclosure of indicators to alleviate reporting burdens and facilitate widespread use without mandating its application.

As a priority the ARESI working group chose to focus on climate change transition indicators, as these are recognised as the most developed and commonly used in European real estate finance. Subsequent work may explore other impact reporting categories and financial product labels.

Addressing Climate Transition Indicators - Current State of Play

The ARESI working group has reviewed the current European regulations and identified ten climate transition indicators (Table 1) being used across the Commercial Real Estate (CRE) sector. These can each be harmonised and applied across Europe, and are globally interoperable with minor adjustments or clarifications. The identified indicators can be applied across the value chain, for both target setting, reporting and tracking progress, and are applicable at the asset, portfolio and corporate levels.

7 Institutional Investors Group on Climate Change (IIGCC), Association of Real Estate Funds (AREF), European Association for Investment into Non-Listed Real Estate Vehicles (INREV), European Public Real Estate Association (EPRA), Better Building Partnership (BBP), Bankers for Net Zero (B4NZ), Green Finance Institute (GFI), Commercial Real Estate Finance Council Europe (CREFC Europe), Carbon Risk Real Estate Monitor (CRREM), Sustainable Markets Initiative (SMI), Urban Land Institute Europe (ULI), World Business Council for Sustainable Development (WBCSD), World Green Building Council (WGBC).

Indicator #	Indicator	Source	Use in Existing European Legislative Frameworks (Non-exhaustive)
1	nearly Zero Energy Building (nZEB)	EPBD	EU Taxonomy, EPBD, SFDR
2	Zero Emission Building (ZEB)		
3	Construction of new buildings	EU Taxonomy (Substantial Contribution Criteria)	EU Taxonomy, SFDR, BBP Acquisition Toolkit
4	Acquisition and ownership of buildings		
5	Renovation of existing buildings		
6	Exposure to fossil fuels through real estate assets	SFDR	SFDR, TCFD, INREV ESG SDDS, GRESB, BBP Acquisition Toolkit
7	Exposure to energy inefficient real estate assets		
8	GHG Emissions		SFDR, CSRD, TCFD, INREV ESG SDDS, RICS ESG data list for real estate valuations, GRESB, CRREM, BBP Acquisition Toolkit
9	Energy consumption intensity		SFDR, CSRD, INREV ESG SDDS, RICS ESG data list for real estate valuations, GRESB, CRREM, BBP Acquisition Toolkit
10	Energy Use Intensity		

The assumptions, ambiguities, and data sources that were being used to report against each of these indicators were identified and adapted through consultation and working group meetings. Having reviewed the data sources, a data quality hierarchy was created (see Appendix 1) for each input to calculations. A comprehensive proposal and methodology to underpin the use of these aligned indicators has also been created in collaboration with the ARESI working group (see Appendix 3 for detailed methodology).

The proposed indicators and data sources were compared against pre-existing industry initiatives and guidance, to identify commonalities and ensure alignment where these indicators are disclosed.[8] Where this proposal builds on value from existing initiatives is in the combined focus on:

- Avoiding the unnecessary creation of new approaches;
- Alignment with existing legislative frameworks and labels;
- Objective indicators with clear calculations that eliminate subjective interpretation;
- Raw sustainability data and the assumptions behind key datasets that influence all upstream data (e.g. specific m^2 measurement used in intensity calculations); and
- Ensuring participation and outcomes are accessible to all, at zero cost;
- Building industry consensus and alignment on addressing indicators.

8 Including European Commission guidance, EU Horizon Projects, INREV guidance, CRREM guidance, AREF guidance, SFDR RTS, and international standards.

Harmonising assumptions and data sources, and adopting a unified approach to these metrics will enable:

- Consistent reporting of indicators across organisations, regulatory and voluntary frameworks, reducing reporting burden and barriers to investment;
- Greater consistency in sustainability data used for valuations, providing clearer evidence of 'green premiums' and 'brown discounts';
- Clear objective targets for sustainability performance in development and refurbishments;
- Structuring of novel climate action-focused investment portfolios such as brown- to-green portfolios; and
- Consistent indicators for sustainability-linked finance agreements and for lenders.

Consultation and Piloting

To ensure widespread applicability and agreement on the proposal, a consultation was undertaken in July and August 2024 to collect feedback on the technical proposal and wider approach to alignment. The consultation was shared with:

- ARESI Working Group Members;
- AREF/BPF/INREV/IPF ESG working group;
- BPP Investor Engagement and European Investment Working Groups;
- Loan Market Association members;
- ULI Sustainability Product Council;
- IIGCC Real Estate Working Group.

A total of 21 responses were received,[9] with 40% of respondents prepared to adopt the proposal as it existed at the time of consultation.

Based on feedback on the technical aspects of the proposal, the proposal was updated and shared with the ARESI working group in January 2025.

100%
of respondents were willing to adopt the proposal following minor amendments

30%
of respondents already use all 10 climate transition indicators

No single floor area standard measurement used more than a

1/3

of the time in sustainability calculations

Pilot Study

To test the proposal's real-world applicability, a pilot was conducted by CBRE Investment Management, LaSalle Investment Management, Savills Investment Management, and Invesco. The pilot comprised two stages:

Stage 1: Assessment of data availability, the burden of data collection, ease of application, and general challenges using real-world assets.

Stage 2: Application of consistent mock data to ensure that all participants achieved values for the ten climate indicators at both the asset and aggregated portfolio levels.

9 Including six responses received by the Loan Market Association from its members

Piloting ARESI

The ARESI methodology was piloted by CBRE IM, Savills IM, LaSalle IM and Invesco, who tested the methodology on a range of real-life assets in their portfolios. Feedback from those piloting was positive, providing clarity and guidance in the specific criteria required to determine compliance with the regulations.

The pilot highlighted the well documented challenges that financial institutions have in obtaining data and the lack of clarity or detail in legislation and regulation. For example, the pilot raised issues around meeting the nZEB requirements (Indicator 1) due to a lack of publicly available thresholds. As a temporary solution CRREM was adopted as a source for Indicator 1 as it is already used in ZEB definition (Indicator 2), is widely accepted as a market benchmark and good geographic and sector coverage.

Following the pilot phase, the methodology was updated, to include reference to CRREM in Indicator 1. In addition, a simplified methodology and flowchart for calculating the KPIs was developed to support users' application of the methodology.

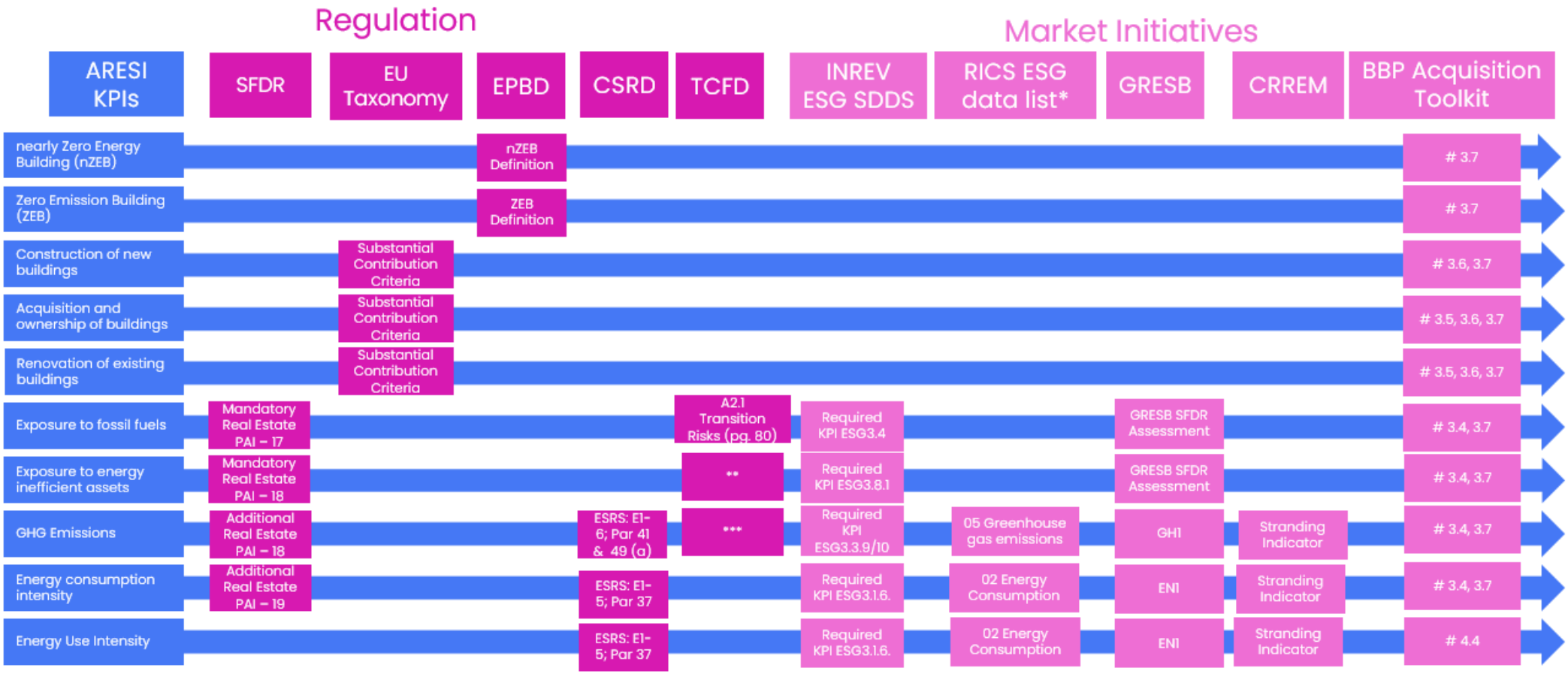
Outcomes and Next Steps

This white paper and the supporting methodology paper set out details of our process and show how assumptions and data sources can be aligned across the sector. These proposals can be adopted today by organisations involved in decision making in the real estate to align industry on reporting and risk management.

We hope that the approach laid out can align industry Indicators in a transparent, and open, way without the need to create anything new, reducing reporting burdens for all involved and increasing investment in sustainable real estate.

Following the publication of this whitepaper, formal engagement is planned both with European regulatory bodies, and industry organisations involved in reporting frameworks. The intention is to follow a two-tier approach:

- Firstly, engaging stakeholders and encouraging them to align to the ARESI proposal enabling greater consistency across the ten indicators identified. Consistent application of the ARESI methodology will also provide clarity on missing pre-requisite information such as nearly Zero Energy Building (nZEB) thresholds; and
- Secondly, to facilitate a wider conversation with regulators on appropriate and ambitious sustainability regulation. Addressing the ambiguating in existing legislative indicators based on industry feedback from their application in the early years of the legislation being in force.


Regulation
Market Initiatives
ARESI KPIs
SFDR
EU Taxonomy
EPBD
CSRD
TCFD
INREV ESG SDDS
RICS ESG data list*
GRESB
CRREM
BBP Acquisition Toolkit
nearly Zero Energy Building (nZEB)
nZEB Definition
3.7
Zero Emission Building (ZEB)
ZEB Definition
3.7
Construction of new buildings
Substantial Contribution Criteria
3.6, 3.7
Acquisition and ownership of buildings
Substantial Contribution Criteria
3.5, 3.6, 3.7
Renovation of existing buildings
Substantial Contribution Criteria
3.5, 3.6, 3.7
Exposure to fossil fuels
Mandatory Real Estate PAI – 17
A2.1 Transition Risks (pg. 80)
Required KPI ESG3.4
GRESB SFDR Assessment
3.4, 3.7
Exposure to energy inefficient assets
Mandatory Real Estate PAI – 18
**
Required KPI ESG3.8.1
GRESB SFDR Assessment
3.4, 3.7
GHG Emissions
Additional Real Estate PAI – 18
ESRS: E1-6; Par 41 & 49 (a)
***
Required KPI ESG3.3.9/10
05 Greenhouse gas emissions
GHI
Stranding Indicator
3.4, 3.7
Energy consumption intensity
Additional Real Estate PAI – 19
ESRS: E1-5; Par 37
Required KPI ESG3.1.6.
02 Energy Consumption
ENI
Stranding Indicator
3.4, 3.7
Energy Use Intensity
ESRS: E1-5; Par 37
Required KPI ESG3.1.6.
02 Energy Consumption
ENI
Stranding Indicator
4.4

Appendix 1: Data source hierarchies

Hierarchy:

1. Tier 1: Legislation and regulation where these indicators originate (e.g. EPBD).
2. Tier 2: Secondary, Tertiary or Recommendations from the original institution (e.g. Commission Recommendation EC 2016/1318).
3. Tier 3: Sources produced by the same wider institution (e.g. European Council, ECB, ESMA) or associated with the same institution (e.g. EU funded research projects or collaborative projects involving the EU).
4. Tier 4: Sources from industry working groups (e.g. WGBC, EPRA, INREV, EPRA etc).
5. Tier 5: Other free and transparent sources from reputable organisations or groups of organisations.

Appendix 2

Example table of how reporting with these indicators could be applied (please note that this is not a regulatory reporting template).

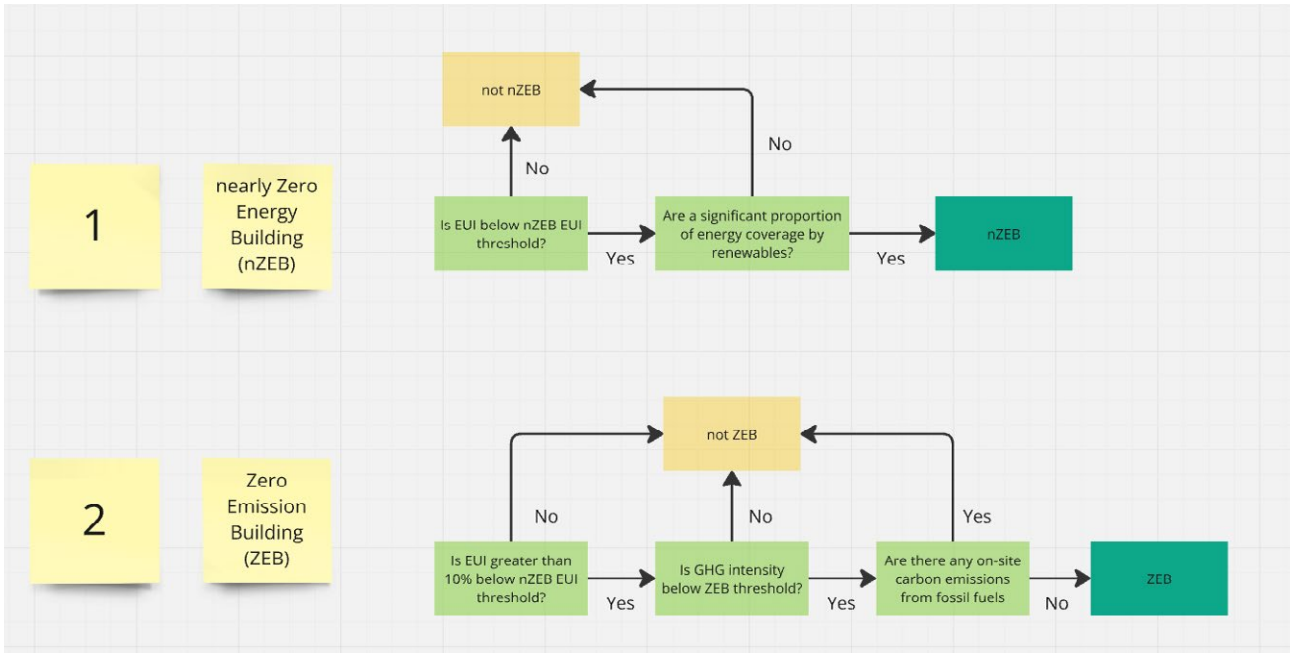
Indicator			Asset-level	Portfolio-level		
				% of Portfolio Asset Value (e.g. GAV)	**% of Asset Count**	**% of Floor Area**
1	nearly Zero Energy Building (nZEB)		Yes/No	% (0-100)	% (0-100)	% (0-100)
2	Zero Emission Building (ZEB)		Yes/No	% (0-100)	% (0-100)	% (0-100)
3	Construction of new buildings*		Meets criteria / Doesn't meet criteria	% meeting criteria (0-100)	% meeting criteria (0-100)	% meeting criteria (0-100)
4	Acquisition and ownership of buildings*		Meets criteria / Doesn't meet criteria	% meeting criteria (0-100)	% meeting criteria (0-100)	% meeting criteria (0-100)
5	Renovation of existing buildings*		Meets criteria / Doesn't meet criteria	% meeting criteria (0-100)	% meeting criteria (0-100)	% meeting criteria (0-100)
6	Exposure to fossil fuels through real estate assets		% of Floor Area Exposed (0-100%)	% of portfolio value exposed (0-100%)	% of assets exposed (0-100%)	% of floor area exposed (0-100%)
7	Exposure to energy inefficient real estate assets	Only assets required to abide by EPC and nZEB rules (Regulation)	% of Floor Area Exposed (0-100%)	% of portfolio value exposed (0-100%)	% of assets exposed (0-100%)	% of floor area exposed (0-100%)
		All assets (Proxy filled)	% of Floor Area Exposed (0-100%)	% of portfolio value exposed (0-100%)	% of assets exposed (0-100%)	% of floor area exposed (0-100%)
8	GHG Emissions		tCO^2e	tCO^2e		
9	Energy consumption intensity**	(Energy Intensities indicator 7 until Primary Energy Factors available)	GWh/m^2	GWh/m^2		
10	Energy Use Intensity	State which of 16 used	kWh/m^2	kWh/m^2		

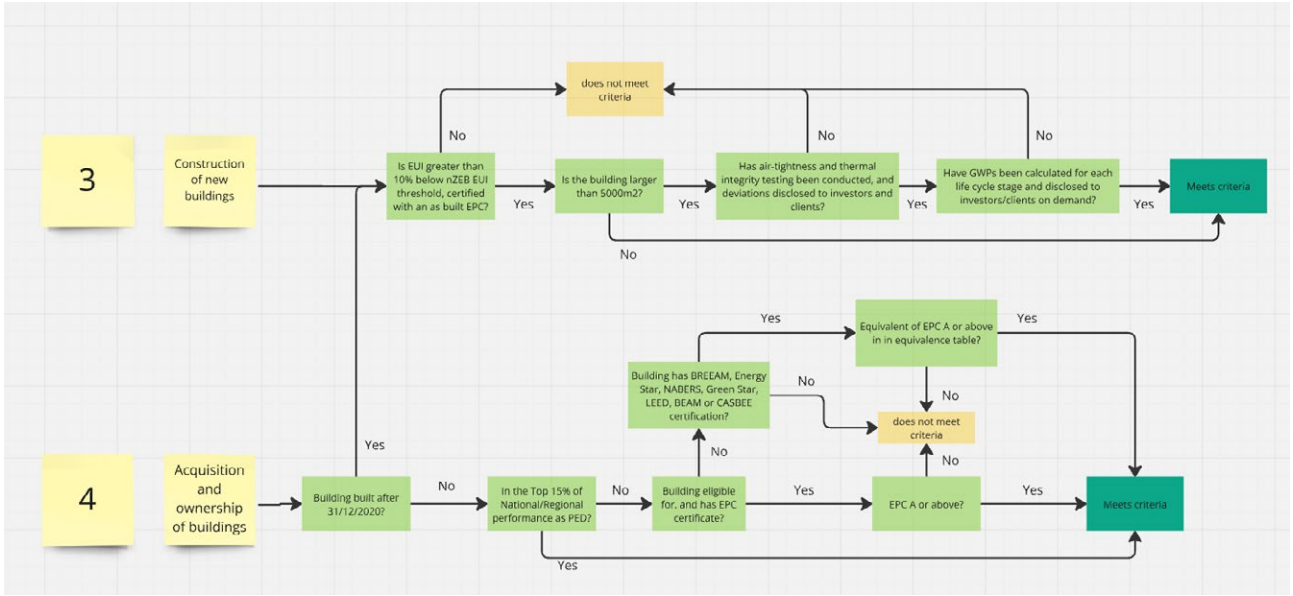
*Meets criteria used, rather than "aligned" as alignment with EU Taxonomy requires compliance with Do No Significant Harm criteria and Minimum Safeguards, whereas KPI 3-5 are solely focused on substantial contribution criteria.

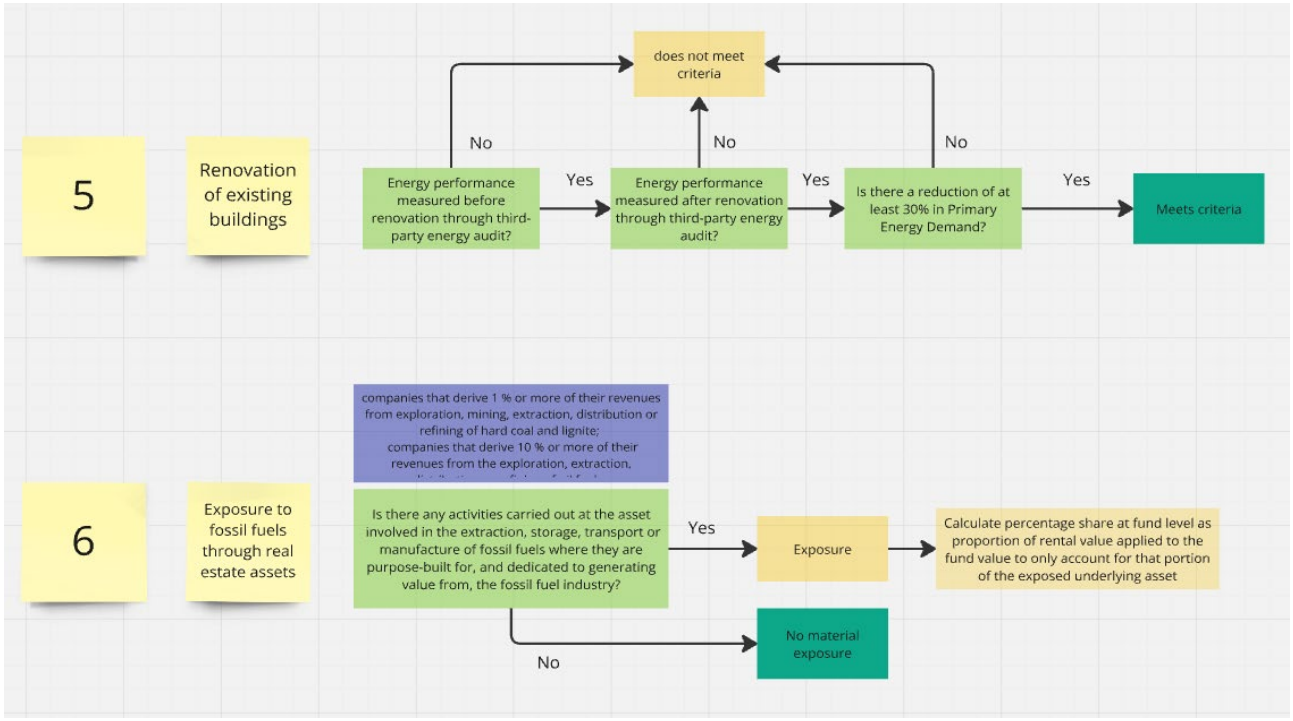
**SFDR Regulation specifically requires GWh/m^2, not kWh/m^2

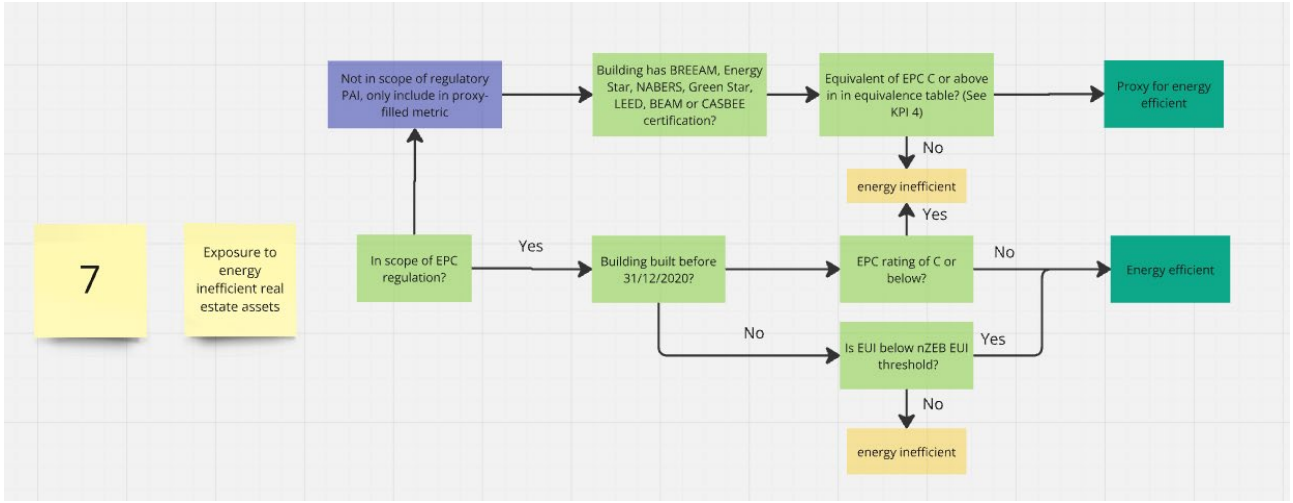
Simplified Methodology

European Performance of Buildings Directive		EU Taxonomy Alignment with Substantial Contribution Criteria of			SFDR				-
nearly Zero Energy Building (nZEB)	Zero Emission Building (ZEB)	Construction of New Buildings	Acquisition and Ownership of Buildings	Renovation of Existing Buildings	Mandatory PAI 17 Exposure to fossil fuels through real estate assets	Mandatory PAI 18 Exposure to energy inefficient real estate assets	Additional PAI 18 GHG Emissions	Additional PAI 19 Energy consumption intensity	Energy Use Intensity
• EUI is below nZEB EUI Threshold; and	• EUI is >10% below nZEB EUI Threshold; and	• EUI is >10% below nZEB EUI Threshold	• Buildings built before 31/12/2020: Top 15% of National/Regional performance as PED; or	• 30% reduction in Primary Energy Demand	• Tier 1 Exposure	• Buildings built before 31/12/2020: EPC B or higher			
• Significant proportion of energy covered by renewables	• Below ZEB GHG Threshold; and		• At least EPC A			• Buildings built after 31/12/2020: See KPI 3			
	• No-onsite carbon emissions from fossil fuels		• Buildings built after 31/12/2020: See KPI 3						






5
Renovation of existing buildings
does not meet criteria
No
No
No
Energy performance measured before renovation through third-party energy audit?
Yes
Energy performance measured after renovation through third-party energy audit?
Yes
Is there a reduction of at least 30% in Primary Energy Demand?
Yes
Meets criteria
6
Exposure to fossil fuels through real estate assets
companies that derive 1 % or more of their revenues from exploration, mining, extraction, distribution or refining of hard coal and lignite;
companies that derive 10 % or more of their revenues from the exploration, extraction,
Is there any activities carried out at the asset involved in the extraction, storage, transport or manufacture of fossil fuels where they are purpose-built for, and dedicated to generating value from, the fossil fuel industry?
Yes
Exposure
Calculate percentage share at fund level as proportion of rental value applied to the fund value to only account for that portion of the exposed underlying asset
No
No material exposure


7
Exposure to energy inefficient real estate assets
Not in scope of regulatory PAI, only include in proxy-filled metric
Building has BREEAM, Energy Star, NABERS, Green Star, LEED, BEAM or CASBEE certification?
Equivalent of EPC C or above in in equivalence table? (See KPI 4)
Proxy for energy efficient
No
energy inefficient
Yes
In scope of EPC regulation?
Yes
Building built before 31/12/2020?
EPC rating of C or below?
No
Energy efficient
No
Is EUI below nZEB EUI threshold?
Yes
No
energy inefficient

Appendix 3: Detailed Methodology

March 2025 Update: Proposal to Address Ambiguity in Real Estate KPIs using Consensus-based Decision Making

The Proposal:

The proposal is based on meetings and consultation with, and inputs from, the working group. It is intended as a measure that can be adopted to address existing ambiguities in European legislative KPIs and to allow some harmonisation in their usage. We hope that in time governments and legislators will clarify the ambiguities and harmonise these indicators across regions to nullify the need for an interim solution as posed below.

The following indicators are based on EU Sustainable Finance Disclosure Regulation (SFDR), EU Taxonomy, and the EU European Performance of Buildings Directive (EPBD). These are mature, European legislative indicators that are also interoperable in many instances globally. Addressing ambiguities in existing frameworks can speed up progress on climate mitigation indicators, instead of creating new ones, which could lead to further industry misalignment.

The proposal uses a consensus-based approach. Where challenges are raised and strong rationale provided for alternatives, these will be reviewed and considered on an ongoing basis.

To address technical ambiguity in these ten-climate transition KPIs, we propose an interpretative hierarchy of sources (see below and Appendix 1), from most preferred source to least. These data sources are comprehensive, open-source and free to access data sources to ensure consistency and to remove barriers to application.

Hierarchy:

- Tier 1: Original regulation and documentation where these KPIs originate (e.g. EPBD)
- Tier 2: Secondary, Tertiary or Recommendations from the original institution (e.g. Commission Recommendation EC 2016/1318).
- Tier 3: Sources produced by the same wider institution (e.g. European Council, ECB, ESMA) or associated with the same institution (e.g. EU funded research projects or collaborative projects involving the EU).
- Tier 4: Sources from industry working groups (e.g. WGBC, EPRA, INREV, EPRA, CRREM etc).
- Tier 5: Other free and transparent sources from reputable organisations or groups of organisations (e.g. ASHRAE 100).

The core climate mitigation indicators proposed are:

KPI #	KPI	Source
ARESI_CT_KPI1	nearly Zero Energy Building (nZEB)	EPBD
ARESI_CT_KPI12	Zero Emission Building (ZEB)	
ARESI_CT_KPI13	Construction of new buildings	EU Taxonomy (Substantial Contribution Criteria)
ARESI_CT_KPI14	Acquisition and ownership of buildings	
ARESI_CT_KPI15	Renovation of existing buildings	
ARESI_CT_KPI16	Exposure to fossil fuels through real estate assets	SFDR
ARESI_CT_KPI17	Exposure to energy inefficient real estate assets	
ARESI_CT_KPI18	GHG Emissions	
ARESI_CT_KPI19	Energy consumption intensity	
ARESI_CT_KPI110	Energy Use Intensity	

Proposal

ARESI_CT_KPI1 : nearly Zero Energy Building (nZEB):

It is proposed to define this according to the latest adopted version of the European Performance of Buildings Directive (EPBD), currently Directive (EU) 2024/2175. This would see a nearly Zero Energy Building (nZEB) defined as:

- having a primary energy demand below defined nZEB thresholds; and
- having the remaining energy covered to a very significant extent by energy from renewable sources

It is proposed that to address ambiguity in this KPI:

In lieu of a Tier 1 source of nZEB thresholds per nation, the nZEB thresholds provided in Section 4.1 of the EC 2016/1318[1] can be used for Offices and New Single-Family Homes.

Given the geographic and asset type limitations of EC 2016/1318 and the ZEBRA2020 data tool[2] users may also use the relevant national energy intensity targets defined in the Carbon Risk Real Estate Monitor (CRREM) as published in 2023.

Given in Annex I of the EPBD 2024 *"Where metered energy use is the basis for calculating the energy performance of buildings, the calculation methodology shall be capable of identifying the influence of the behaviour of occupants and the local climate, which shall not be reflected in the result of the calculation"*, where EPCs are not available, primary energy intensity should be based upon ARESI_CT_KPI10 - 15: Gross Actual Primary Energy excluding transition enabling energy use, where the energy use is of regulated loads only. Where measured data is used, this should be based on at minimum monthly intervals of meter readings as per Annex I of EPBD 2024.

Assumptions:

- Primary energy demand refers to ARESI_CT_KPI10 - 13: Gross Design Primary Energy excluding transition enabling energy usage. This should be sourced from the EPC certificate where available.
- A "very significant extent" of energy sourcing to be defined as over 75% as percentage of annual gross energy consumption until defined in the regulations.
- For jurisdictions lacking thresholds in the specified sources, local taxonomies such as the ASEAN taxonomy alignment may be used as recommended by INREV[3].

ARESI_CT_KPI2 : Zero Emission Building (ZEB)

It is proposed to define this according to the latest adopted version of the European Performance of Buildings Directive (EPBD), currently Directive (EU) 2024/2175. This would see a Zero Energy Building (ZEB) defined as:

- having a primary energy demand 10% below nZEB thresholds (see ARESI_CT_KPI1), i.e. meeting the definition of 'highly efficient'; and
- having operational GhG emissions below national thresholds; and
- having no on-site carbon emissions from fossil fuels; and
- where technically and economically feasible: energy is sourced entirely from renewable energy sources;[4] energy from renewable sources generated onsite or nearby; from a renewable energy community; from efficient district heating and cooling and offers the capacity to react to external signals and adapt its energy use, generation or storage.

It is proposed that to address ambiguity in this KPI:

In lieu of a Tier 1 source of ZEB EUI thresholds, the same source for EUI thresholds should be used as ARESI_CT_KPI1, with a 10% reduction applied to the relevant threshold.

In lieu of a Tier 1 source of ZEB GHG thresholds, relevant sectoral and national CRREM 2050 GHG targets[5] are used. This is aligned with INREV guidance which states CRREM as a potential source for GHG intensity thresholds[6] (though noting this is in relation to ARESI_CT_KPI8 - SFDR Additional PAI 18 GHG Emissions). When aligning assessment of thresholds GHG emission calculations should be based on energy modelled from as built/as designed.

In lieu of a Tier 1 source of technical and economic feasibility, to define technical feasibility as interventions having a whole life carbon payback period as 10%< lower than the lifespan of the intervention. To define economic feasibility as interventions where the costs do not outweigh the financial and non-financial benefits over a reasonable timeframe and thus do not hinder the organisation's ability to achieve its financial goals. Given that UK Minimum Energy Efficiency Standard (MEES) regulations enable an exemption to be granted for measures with a payback period of over 7 years, we would seek to define this reasonable timeframe as 7 years.

Given in Annex I of the EPBD 2024 *"Where metered energy use is the basis for calculating the energy performance of buildings, the calculation methodology shall be capable of identifying the influence of the behaviour of occupants and the local climate, which shall not be reflected in the result of the calculation"*, where EPCs are not available, primary energy intensity should be based upon EUI KPI 15: Gross Actual Primary Energy excluding transition enabling energy use, where the energy use is of regulated loads only. Where measured data is used, this should be based on at minimum monthly intervals of meter readings as per Annex I of EPBD 2024.

Assumptions:

- Primary energy demand refers to EUI KPI 13: Gross Design Primary Energy excluding transition enabling energy usage. This should be sourced from the EPC certificate where available.
- We note that the 2024 Recast EPBD ZEB definition refers to energy being sourced from 'carbon-free sources'. In order to align with ARESI_CT_KPI1 we proposed using 'renewable energy sources' as defined by IWA 42:2022
- Operational greenhouse gas emissions are based on typical usage and operation of a building, thus do not include emissions from e.g. diesel back-up power generators or high GWP refrigerants within the scope of this. Operational focus is on the building itself rather than tenants so tenant activities such gas-powered forklifts are not in scope.
- US ZEB definitions would be as defined by US Department of Energy, which currently defines the minimum energy efficiency performance of having an ENERGY Star score of 75 or higher[7].

ARESI_CT_KPI3 : EU Taxonomy Alignment with Substantial Contribution Criteria of Construction of New Buildings

It is proposed to define this according to the latest adopted version of the Taxonomy Delegated Acts, currently Regulation (EU) 2020/852. This would see a substantial contribution to climate mitigation defined as:

- 10% lower primary energy demand than nZEB requirements certified using the as built Energy Performance Certificate (EPC).

It is proposed that to address ambiguity in this KPI:

The same source for EUI thresholds should be used as ARESI_CT_KPI1, with a 10% reduction applied to the relevant threshold.

Assumptions:

- Primary energy demand refers to ARESI_CT_KPI10 - 13: Gross Design Primary Energy excluding transition enabling energy usage. This should be sourced from the EPC certificate where available. In some countries the primary energy demand is not written in the EPC, but this can be taken from the standard calculation ARESI_CT_KPI10 - 13.

ARESI_CT_KPI4 : EU Taxonomy Alignment with Substantial Contribution Criteria of Acquisition and Ownership of Buildings

It is proposed to define this according to the latest adopted version of the Taxonomy Delegated Acts, currently Regulation (EU) 2020/852. This would see a substantial contribution to climate mitigation defined as:

- Buildings built before 31 December 2020: An Energy Performance Certificate (EPC) rating of "A" or higher; or within the top 15% of the national or regional building stock.
- Buildings built after 31 December 2020: See ARESI_CT_KPI3.

It is proposed that to address ambiguity in this KPI:

To ensure accuracy, where an EPC rating is available, but the building has undergone significant modifications that may alter the energy performance, a reassessment of EPC should be conducted.

Where EPC ratings are not available for either a whole, or partial area of a building, it is recommended that an EPC assessment is undertaken covering the required area. Where this is not possible, in EU member states (and the UK), a proxy can be used to show equivalence[8]. Energy use intensity (ARESI_CT_KPI10 - 11: Gross Measured Final Energy excluding transition enabling energy usage) should be used as a proxy to estimate EPC banding from known EPC ranges per member state, as shown by the European Data Warehouse. Noting this is final energy, rather than primary, once a comprehensive source of primary energy factors are identified, this will be applied to this proxy calculation.

Where EPC ratings are not available for either a whole, or partial area of a building, outside of EU member states (and the UK), building certifications should be used as a proxy to estimate EPC banding according to the diagram below.

EPC	BREEAM ENE1 Score	Energy Star	NABERS and Green Star	LEED	BEAM	CASBEE
A+	Outstanding	95+	6 Stars	-	-	-
A	Excellent	90+	5.5 Stars	Platinum	Platinum	S
B	Very Good	75+	4, 4.5, & 5 Stars	Silver / Gold	Gold/Silver	A
C	Good	55+	3 & 3.5 Stars	-	Bronze	B+
D	Pass	40+	2, 2.5 Stars	Certified	-	B-
E	-	25+	1 & 1.5 Stars	-	-	C
F	-	10+	0 Star	-	-	-
G	-	0+	-	-	-	-

Energy Star: Equivalent Energy Star ratings estimated from percentage attainment of EPCs per rank using UK EPC data (https://www.data.gov.uk/dataset/99458be9-936d-46be-b763-87cf68d6bd39/energy-performance-of-buildings-register-england-and-wales). INREV Sustainable Investment Principles 2024. (https://www.inrev.org/system/files/2024-04/INREV-Sustainable-Investment-Principles-2024_1.pdf)

NABERS and Green Star: INREV Sustainable Investment Principles 2024. (https://www.inrev.org/system/files/2024-04/INREV-Sustainable-Investment-Principles-2024_1.pdf) Background: Existing Japanese Systems Related to Sustainable Housing (https://www.researchgate.net/publication/321641683_Background_Existing_Japanese_Systems_Related_to_Sustainable_Housing) International Comparison of Sustainable Rating Tools (https://www.tandfonline.com/doi/pdf/10.1080/10835547.2009.12091787)

BREEAM: International Comparison of Sustainable Rating Tools (https://www.tandfonline.com/doi/pdf/10.1080/10835547.2009.12091787)

LEED: BEAM Plus NB (v2.0) rating tool as compared to its national and international counterparts (https://www.hkgbc.org.hk/eng/beam-plus/beam-plus-references/ref-others/OtherRefFiles/Rating%20tool%20benchmarking%20study%20-%2031%20December%202020.pdf). Analyzing the compliance and correlation of LEED and BREEAM by conducting a criteria-based comparative analysis and evaluating dual-certified projects (https://www.sciencedirect.com/science/article/abs/pii/S0360132318305493#:~:text=Correlation%20of%20LEED%20and%20BREEAM%20is%20analyzed%20to%20estimate%20dual,of%20issues%20to%20be%20fulfilled) Background: Existing Japanese Systems Related to Sustainable Housing (https://www.researchgate.net/publication/321641683_Background_Existing_Japanese_Systems_Related_to_Sustainable_Housing) International Comparison of Sustainable Rating Tools (https://www.tandfonline.com/doi/pdf/10.1080/10835547.2009.12091787)

BEAM: BEAM Plus NB (v2.0) rating tool as compared to its national and international counterparts (https://www.hkgbc.org.hk/eng/beam-plus/beam-plus-references/ref-others/OtherRefFiles/Rating%20tool%20benchmarking%20study%20-%2031%20December%202020.pdf)

CASBEE: International Comparison of Sustainable Rating Tools (https://www.tandfonline.com/doi/pdf/10.1080/10835547.2009.12091787)

In lieu of a Tier 1 source of Top 15% performance, it is proposed to kWh values defined by national averaged normalised carbon intensity (NCI) as shown in the Climate Bonds Initiative European City Trajectories. Until a Tier 1 source is provided for this, we will use ARESI_CT_KPI10 - 9: Gross Design Final Energy excluding transition enabling energy usage. For cities not included within this source, the carbon intensity from the CBI Location Specific Criteria for Commercial Buildings & Calculator should be used. Alternatively, where this data is not available user may use the thresholds in ASHRAE 100:2024[9]

Assumptions:

- We acknowledge that differences exist in EPC regimes between nations, as evidenced by the European Data Warehouse source. However, EU Taxonomy regulation does not distinguish between EPC ratings among member states, stating a universal EPC 'A' rating for alignment with ARESI_CT_KPI4. Therefore, for consistency with European Regulation, where EPC ratings are available, we propose that those of the same level are equivalent (e.g. EPC A in UK equals EPC A in Spain). Whilst this is an oversimplification it allows for informal harmonisation until a formal harmonisation review has been completed.
- Calculations using EPCs should be conducted at the most granular level with data available i.e. unit-level if data is available rather than whole-building data.

ARESI_CT_KPI5: EU Taxonomy Alignment with Substantial Contribution Criteria of Renovation of Existing Buildings

It is proposed to define this according to the latest adopted version of the Taxonomy Delegated Acts, currently Regulation (EU) 2020/852. This would see a substantial contribution to climate mitigation defined as:

- an upgrade meeting cost-optimal minimum energy performance requirements; or
- a reduction of primary energy demand (PED) of at least 30%

It is proposed that to address ambiguity in this KPI:

In lieu of a Tier 1 source of cost-optimal minimum energy performance requirements for all member states, to use the reduction in primary energy demand (PED) of at least 30% as the primary way to measure alignment.

The reduction in PED should be measured and certified by comparing the pre-renovation PED as measured by a third-party energy audit, against the PED as measured by a third-party energy audit after the renovation has taken place (ideally the same third-party that conducted the pre-renovation energy audit). The calculation used for both before and after renovation, should be the local calculation methodology of PED.

An alternative way to define the PED is to use the CRREM pathway for the specific building. If a building achieves a (30%) progress reducing its carbon intensity than the investment could be seen as Taxonomy Alignment with Substantial Contribution of Renovation of Existing Buildings.

Assumptions:

- Primary energy demand refers to ARESI_CT_KPI10 - 13: Gross Design Primary Energy excluding transition enabling energy usage. This should be sourced from the EPC certificate where available.
- We assume the 30% reduction in PED is driven by the energy hierarchy and urgent need to decrease energy consumption, easing the burden on national grids, and promoting faster decarbonisation. In this case, as a reduction in energy use stemming from a change in asset class (e.g. office to residential) ultimately lowers demand on the grid and will facilitate accelerated decarbonisation. Therefore, variations in energy use arising from changes in asset class can qualify for alignment and should be considered, however, where variations do arise from this change in asset class, they should be declared.

ARESI_CT_KPI6: SFDR Mandatory PAI 17 Exposure to fossil fuels through real estate assets

It is proposed to define this according to the latest adopted version of the Taxonomy Delegated Acts, currently Regulation (EU) 2019/2088. This would see exposure to fossil fuels through real estate assets defined as: the share of investments in real estate assets involved in the extraction, storage, transport or manufacture of fossil fuels," where "fossil fuel" is defined as "non-renewable carbon-based energy sources such as solid fuels, natural gas and oil."

It is proposed that to address ambiguity in this KPI:

In the absence of a description of what constitutes "exposure," that this considers real estate assets and activities within assets to be involved in the extraction, storage, transport or manufacture of fossil fuels where they are purpose-built for, and dedicated to generating value from, the fossil fuel industry. The focus of this metric is targeted towards material exposure to the fossil-fuel economy significant enough to cause harm, rather than direct fossil fuel emissions (eg gas boilers for central heating or back-up diesel generators), as such this is a separate definition to no-on site emissions from fossil fuels.

To aid nuance and differentiate in the levels of exposure, a tier system of exposure is provided below to provide a framework to assess materiality within the income stream of a given asset. For this specific KPI, material exposure would purely consider Tier 1 exposure as in scope to be disclosed (as a proportion of fund value). Where additional nuance can be added (e.g. if not prohibited by regulatory disclosure templates), it is proposed that this should specifically state either [Tier 1]/[Tier 2]/[Tier 3] exposure to fossil fuels through real estate assets.

Level of Exposure	Definition	Examples
Tier 1	Purpose-built assets for the extraction, storage, transport or manufacture of fossil fuels. Purpose-built being that fossil fuels are integral to the operation of the asset and substantive changes to the asset would be required to enable a non-fossil-fuel-based economic activity to take place. The asset is dedicated to generating value from the fossil fuel industry	Industrial combined cycle gas turbine; petrol station; refinery. The storage of fossil fuels for profit would be included within this where the primary economic activity is the sale of fossil fuels, i.e. storage of large quantities of diesel for sale by a petrol station would be in scope, but the storage of a small quantity of pre-packaged petrol in a home improvement store for use in garden equipment would not be in scope.
Tier 2	Assets not purpose-built for the extraction, storage, transport or manufacture of fossil fuels, or dedicated to generating value from fossil fuels, but where operational equipment may directly produce emissions from fossil fuels.	Gas boilers as part of an office building's HVAC system. Tenants using or storing small amounts of fossil fuels as part of their operations (e.g. fuel for forklift trucks).
Tier 3	Assets with occupiers that have a core business model focusing on the extraction, storage, transport or manufacture of fossil fuels.	Petrochemical company as a tenant in an office.

Investment managers should target for 0% exposure to fossil fuels, but as outlined in the INREV Sustainable Investment Principles a threshold exposure of 5% revenue from fossil fuel activities is viewed as acceptable.[10]

A proportion of an asset may be partially exposed e.g. petrol station within a larger retail park. Where assets may be seen to have <100% exposure within a given asset, aligning with AREF guidance[11], *"the percentage share may be calculated as the proportion of rental value applied to the fund value to only account for that portion of the underlying asset".*

The specific boundaries for companies classed as having a core business focusing on the extraction, storage, transport or manufacture of fossil fuels / fossil fuel activities would follow that of Article 12.1 of the EU Climate Benchmarks Standards Regulation[12] which states

"companies that derive 1 % or more of their revenues from exploration, mining, extraction, distribution or refining of hard coal and lignite;

companies that derive 10 % or more of their revenues from the exploration, extraction, distribution or refining of oil fuels;

companies that derive 50 % or more of their revenues from the exploration, extraction, manufacturing or distribution of gaseous fuels;

companies that derive 50 % or more of their revenues from electricity generation with a GHG intensity of more than 100 g CO2 e/kWh."

Assumption:

- Per the AREF/INREV/IPF working group question on supply chain exposure[13], Tier 3 is the only consideration of wider supply chain exposure within a given asset.
- As per EU Taxonomy DNSH rules for climate mitigation, buildings are not deemed to be exposed where small quantities of fossil fuels might need to be stored or transported, but where the building is dedicated to completely different use, such as a residential building.[14]

ARESI_CT_KPI7: SFDR Mandatory PAI 18 Exposure to energy inefficient real estate assets

It is proposed to define this according to the latest adopted version of the Taxonomy Delegated Acts, currently Regulation (EU) 2019/2088. This would see exposure to energy inefficient real estate assets through real estate assets defined as:[15]

$$\frac{\text{(Value of real estate assets built before 31 December 2020 with EPC of C or below)+ (Value of real estate asset built after 31 December 2020 with PED below NZEB in Directive 2010/31/EU)}}{\text{Value of real estate assets required to abide by EPC and NZEB rules}}$$

It is proposed that to address ambiguity in this KPI:

We use the same gap fills regarding nZEB as ARESI_CT_KPI1.

We use the same gap fills regarding EPCs as ARESI_CT_KPI4.

When linking EPC floor area to overall exposure utilising asset value as a metric (e.g. X% of inefficiency as a measure of total GAV of the portfolio), we propose to follow the AREF suggestion noted above where "*the percentage share may be calculated as the proportion of rental value applied to the fund value to only account for that portion of the underlying asset.*".EU regulatory definitions only cover EPC and NZEB in scope buildings, but as best practice, all buildings in a given portfolio (including those outside of the EU) should be reported as a separate metric where available alongside a metric of those assets in scope of EU regulations.

When calculating exposure within a portfolio, this should be consolidated on a financial control basis where an entity has <100% equity control. Where this is the case, exposure should be proportioned as a percentage of ownership.

Assumption:

- When linking EPCs to floor area, in reference to underlying asset, this should be calculated as a proportion of EPCs at a unit level rather than taking the single EPC rating with the greatest proportion of floor area across the asset.
- All m2 within a given asset is worth the same value as a percentage of overall asset value, rather than having varying value per m2 for differing areas of an asset.
- Where an asset is owned 100% by the portfolio but has a tenant with day-to-day control over an asset, for the purposes of this KPI, financial control shall be defined as ownership.

ARESI_CT_KPI8: SFDR Additional PAI 18 GHG Emissions

It is proposed to define this according to the latest adopted version of the Taxonomy Delegated Acts, currently Regulation (EU) 2019/2088. This would see greenhouse gas emissions through real estate assets defined as:

GHG emissions (tCO_2e) = energy consumption * emissions factor

It is proposed that to address ambiguity in this KPI:

Individual calculation methodologies may vary between organisations with differing boundary scopes, sources of emission factors, etc limiting the ability to adopt a single consistent method across organisations. To enable standardisation of GHG reporting as far as possible, the principles proposed by AREF, BPF, CREFC Europe, INREV, IPF, PfP and TGE working group[16] relevant to the reporting of sustainability data should be adopted, (namely the most relevant sections **in bold** below):

1. **Transparency: Relevant stakeholders should be transparent in their approach to reporting and supply complete disclosure of all activities within the stated scope and boundary, the granularity of data reporting, and avoid reporting only on positive results.** For context, disclosure should be accompanied by information on the limits of the environmental and/or social resources at the sector, local, regional, or global level.
2. **Consistency and comparability: All parties are encouraged to disclose a minimum set of ESG metrics for real estate applying standardised reporting methodologies, scope and reporting boundaries to support comparability across the market. Comparability needs to be between investment types and between real estate asset classes. It is envisaged that the minimum set of ESG disclosure metrics for real estate would be supplemented with other metrics, as appropriate, for investment portfolios and the different real estate asset classes.**
3. **Verification: All parties are encouraged to verify data to an external standard using independent third-party verification.** Nevertheless, the Working Group acknowledges the practical challenges for landlords associated with the verification of occupier data.
4. **Detailed data notes: All parties must disclose emissions factors, estimation methodology, scope and boundaries, and any limitations, such as use of benchmark/proxy data in the absence of actual portfolio/asset specific data. Details on any acquisitions, divestment, and/or policy changes and how they affect portfolio performance and trends over the reporting period shall be included.**
5. Simplicity: Some reporting metrics involve complex calculations. The aim should be to keep ESG metrics for real estate and data collection as simple as possible to ensure reporting is cost effective, feasible to collect and achieves optimal coverage.
6. **Measurement over modelling: Actual data is preferred over modelled or benchmark/proxy/estimated data. If it is not possible to collect and measure actual data, reasons for using alternative data and the methodology used must be disclosed and justified.** This presents practical challenges in a landlord and occupier scenario. Legislative changes will be required to achieve this goal if this cannot be achieved by voluntary action.

The appraoch aligns with the EPRA sBPR KPIs: GHG-Dir-Abs and GHG-Indir-Abs, which measure absolute Scope 1 and 2 emissions in metric tonnes CO2e.[17]

CRREM can be used to assess the GHG emissions in Real estate. CRREM's pathways can be used to set benchmarks and targets that can be disclosed under SFDR.

Organisations should aim to be as transparent as possible in their greenhouse gas calculations methodologies. When reporting this *"should disclose and justify data gaps clarifying the proportion of floor area for which actual, proxy and/or no data is provided"*.

Further we would seek that disclosure of non-operational emissions (eg. f-gas emissions) are excluded, where the data is available, they should be included and reported alongside disclosure of operational GHG emissions.

Organisations should seek independent assurance of greenhouse gas calculation methodologies, where possible this should be aligned to ISO14064.

Assumption:

- In this use case, Scope 3 emissions are primarily relating to operational emissions and do not include value chain emissions (e.g. whole life carbon). This includes operational carbon emissions from all Scopes, with Scope 3 emissions specifically limited to real estate ownership and tenant energy, and does not consider other sources of carbon emissions, such as F-gases, transmission and distribution losses, well to tank, water consumption or company emissions in line with INREV guidance[18].

ARESI_CT_KPI9: SFDR Additional PAI 19 Energy consumption intensity

It is proposed to define this according to the latest adopted version of the Taxonomy Delegated Acts, currently Regulation (EU) 2019/2088. This would see exposure to energy consumption intensity is defined as:

$$\text{Energy consumption intensity (GWh/m}^2\text{)} = \frac{\text{Total energy consumption (GWh)}}{\text{Total floor area (m}^2\text{) * Data coverage by time by area (\%)}}$$

It is proposed that to address ambiguity in this KPI:

EUI KPI 15: Gross Measured Primary Energy excluding Transition Enabling energy use is used. This will enable better tracking of year-on-year efforts and better reflect energy efficiency measures that have been taken year-on-year compared to net EUI. For consistency with other KPIs, this should be focused on primary energy where this can be calculated. By excluding, transition enabling measures this will prevent the expansion of transition enabling measures from increasing energy consumption and raising the risk of appearing to greenwash despite active efforts on the contrary.

Noting most sources of energy available to organisations is final energy, rather than primary, once a comprehensive source of primary energy factors are identified, this will be applied to this calculation to enable calculation of KPI 15.

Assumptions:

- The measure of floor area for this should be GIA measured using IPMS 2, in line with the proposal in KPI 10 for alignment on floor area for intensity calculations.

ARESI_CT_KPI10: Energy Use Intensity

Many different types of energy intensity are used across regulation and voluntary initiatives, it is proposed a clear list of four binary options to delineate scope of energy usage regarding the numerator of energy/ floor area. These four options can be combined into 16 options in total.

Gross	or	**Net**
Total energy consumed within the building		Netted against on-site renewable generation, only energy drawn from grid / district systems
Design	or	**Measured**
When building is used as intended and designed, to control for anomalous tenant use. Typically, as stated on EPC.		Actual energy usage as measured by meters
Final	or	**Primary**
Energy used within the building i.e. socket load		Energy used within building and to provide energy to building i.e. including T&D and conversion losses
Incl. Transition Enabling	or	**Excl. Transition Enabling**
Including energy from activities that facilitate wider decarbonisation of the economy i.e. EV charging energy use		Excluding energy from activities that facilitate wider decarbonisation of the economy i.e. EV charging energy use

1	Gross	Design	Final	Energy Use	Incl. Transition Enabling
2	Net				
3	Gross	Measured			
4	Net				
5	Gross	Design	Primary		
6	Net				
7	Gross	Measured			
8	Net				
9	Gross	Design	Final		Excl. Transition Enabling
10	Net				
11	Gross	Measured			
12	Net				
13	Gross	Design	Primary		
14	Net				
15	Gross	Measured			
16	Net				

It is noted that this enables on-site renewable energy to easily be derived as the subtraction of net energy against gross energy.

Aligning with KPI 9, where measured energy intensity is calculated, this should utilise the same formula to account for incomplete data coverage by floor area and/or time.

Regarding the denominator of floor area, as noted by the AREF, BPF, CREFC Europe, INREV, IPF, PfP and TGE working group proposal[19], there exists ambiguity in floor area used to calculate this which may be Gross Internal Area (GIA), Gross Floor Area (GFA) Net Lettable Area (NLA), etc. We should seek to align with the other KPIs noted in this document as far as possible and use the calculation of energy performance stemming from application European Regulation, (EPBD, EPC calculations) as a base framework. With the EPBD specifying that the energy performance of buildings should be based upon "*the sum of the useful floor areas of the spaces within the building envelope specified*", we assume that gross internal area (GIA) would be the closest readily available measurement to total useful floor area. Therefore, when stating any form of energy intensity, it should be calculated used GIA as default. The floor area used (even if GIA) should always be stated alongside the provided energy intensity figure for transparency. We acknowledge that measurement of GIA will vary between countries, therefore we recommend the usage of IPMS 2 as a consistent metric to measure GIA[20]. This is aligned with both European Commission guidance which states the use of IPMS for total useful floor area[21], and CRREM which states that GIA according to IPMS 2 should be used as the basis of floor area[22].

Assumptions:

- For net, all carbon-free energy produced and consumed on-site renewable should be subtracted against gross energy use to obtain net energy use (Includes solar PV, wind energy, heat pumps, biomass).
- For net, energy produced and consumed from fossil-fuels should not be subtracted.
- A comprehensive source can be found that identifies primary energy factors across Europe. If one cannot be identified, this group will work towards producing one.

C: Glossary

Term	Source	Definition
Assets		Tangible assets deployed as investment mediums and are subject to broader non-financial regulations (e.g. European Performance of Buildings Directive [EPBD]). In this context, typically individual buildings.
Building Date	AREF	Date the building permit was issued.
Carbon-free Energy	-	Lacking a definition of carbon-free energy in the EPBD 2024 recast, we assume this to be all renewable energy sources, as well as nuclear energy.
Investors		Entities engaged in investment operations, either on their own behalf or for a third party, with the objective of achieving a return on investment, which can be financial and/or non-financial (e.g. diminishing greenhouse gas emissions). These entities are generally governed by financial transparency regulations (e.g. EU Sustainable Finance Disclosure Regulation [SFDR]).
Operational Greenhouse Gas Emissions	EU EPBD 2024	Greenhouse gas emissions associated with the energy consumption of the technical building systems during the use and operation of the building
Portfolio		An aggregated group of real estate investment assets supervised by an investor. These entities are also broadly subject to financial disclosure regulations (e.g. EU Sustainable Finance Disclosure Regulation [SFDR]).
Reference Floor Area	EU EPBD 2024	Floor area used as reference size for the assessment of the energy performance of a building, calculated as the sum of the useful floor areas of the spaces within the building envelope specified for the energy performance assessment;
Renewable Energy	EU EPBD 2024	Energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic) and geothermal energy, osmotic energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas
Scope 1 Emissions	Greenhouse Gas Protocol	Direct GHG emissions occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.
Scope 2 Emissions	Greenhouse Gas Protocol	GHG emissions from the generation of purchased electricity2 consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company
Scope 3 Emissions	Greenhouse Gas Protocol	Emissions [that] are a consequence of the activities of the company but occur from sources not owned or controlled by the company. See assumptions in KPI 8 for further detail.
Useful Floor Area	EU EPBD 2024	The area of the floor of a building needed as parameter to quantify specific conditions of use that are expressed per unit of floor area and for the application of the simplifications and the zoning and allocation or re-allocation rules;
Proportion energy from renewable resources, by on-site (%)	INREV - ENV41	The proportion of total energy consumption from renewable energy sources generated on-site.
Proportion energy from renewable resources, by off-site (%)	INREV - ENV41	The proportion of total energy consumption from renewable energy sources generated off-site.

Changelog:

Changes have been made to the initial proposal as detailed below following feedback from the ARESI working group and broader consultation.

Changes are shown in standard text, further commentary in *italics*.

- Survey: Included an addition question on accessibility for non-technical audiences.
- Proposal: Included a glossary of key terms.
- Glossary: Amended source of renewable energy definition to EU EPBD 2024. Included definitions of proportion of energy from renewable sources and emission scopes. Defined investors, portfolio and assets within the context of this specific proposal.
- KPI 1:
  - Included further specification on regulated vs unregulated loads where EPC is not present.
    Concern raised over impact of tenant activity on energy demand, as the intensity figure is based upon design/EPC ratings, actual tenant usage differing from intended designed use should be accounted for and not adversely impact qualification for nZEB/ZEB.
    CRREM inserted as a Tier 3 source of threshold for nZEB.
- KPI 2:
  - Included further specification on regulated vs unregulated loads where EPC is not present. Added note that difference in carbon-free sources vs renewable sources is present in definition of ZEB vs nZEB. Added definition of reasonable timeframe to align with UK MEES regulations.
    - When aligning assessment of thresholds GHG emission calculations should be based on energy modelled from as built/as designed.
    - *Where PED is not provided by EPCs in given countries, we propose the use of EUI KPI 13: Gross Design Primary Energy excluding transition enabling energy usage. Wholly agree that a consistent approach to convert from final to primary energy is required, a source has not yet been identified for this, hence the first survey question on KPI 10 on knowledge of existing sources for this.*
    - *It is acknowledged that while a high-level definition is provided for economic feasibility, this does still leave some existing ambiguity. We intend to continue using the current definition to maintain momentum in this proposal given the potential for widespread differing on views on this. Longer term we hope to provide a more immediately applicable definition, ideally based on further publication of cost-optimal pathways following the publication of the revised 2024 EPBD. It is also acknowledged that in certain jurisdictions, the proposed definition of technical feasibility may exclude certain measures e.g. installation of rooftop solar PV in a country with 100% carbon-free national grid. However, the intention is to provide a baseline for feasibility, rather than mandating when the activity should/should not take place, as such this does not prevent the asset owner for undertaking activities not judged as technically feasible. Wider considerations of whole life carbon payback will be considered in subsequent discussions focusing on the relation between nZEB/ZEB and whole life carbon payback.*
  - *Assumptions: US ZEB definition inserted*
- KPI 3:
  - Specified that the 10% reduction should be in primary energy demand (PED) as per European regulation.
    - *Option to judge 10% reduction using more accurate 3D modelling was suggested, we have opted to not include this currently to align with European regulation as far as possible but are open to this being included if there is support for it.*
  - Assumptions – inserted: *In some countries the primary energy demand is not written in the EPC, but this can be taken from the standard calculation*
- KPI 4: Noted that prior to use of a proxy for equivalence, an EPC assessment should first be sought where possible. Noted that reassessment of EPC should be conducted where substantial changes made to the building. Provided further clarification that while we acknowledge differences in EPCs exist between member states, they are assumed to be identical for the purpose of the calculation to align with the underlying European regulation which does not differentiate between member states.
  - Is it noted that a differing expiry date from EPC could be considered, or requirement for written confirmation that the current EPC is representative of the building in its current state and captures any recent modifications that may have altered the building performance and rating. Added the need to reassess EPC where changes in performance may occur from modifications. However, regarding the age of the rating, to align with European regulation, we are currently proposing to take the EPC at face value and assume accuracy in lieu of other metrics.

- KPI 5:
  - Further clarification on impact of change of asset class in relation to overall reduction in PED.
  - Clarified that where not included on EPC the calculation used for both before and after renovation, should be the local calculation methodology of PED.
  - ASHRAE 100:2024 added as a Tier 5 source
- KPI 6:
  - Further clarification provided to note that the intention of the tier system is to provide a general framework for material exposure. Amended the definition of Tier 3 fossil fuel exposure to be cover any asset class.
    - *It is noted that the IPMVP was recommended as a source for measurement of efficiency improvements. However, with the intention of this proposal being open source to encourage and minimise barriers to use, this standard paywalled, and so has not been included.*
  - Inserted INREV definition of exposure to fossil fuel activities
  - Assumptions - inserted EU DNSH criteria where buildings are not deemed to be exposed where small quantities of fossil fuels might need to be stored or transported, but where the building is dedicated to completely different use, such as a residential building
- KPI 7:
  - Specified financial control and the underlying assumptions with this.
  - Specified that best practice to report buildings outside of EU alongside those in scope of EU regulations
- KPI 8:
  - Clarified operational Scope 3 carbon emissions with INREV guidance (i.e. exclusion of F-gases currently).
    - Recommendation made to clarify and update formula provided, as this formula is directly provided by regulation, we are opting to maintain current definition to align as far as possible.
  - Clarified that non-operational emissions (eg f-gases) should be reported alongside operational emissions
  - Clarified that CRREM can be used to assess GHG emissions, pathways as benchmarks and targets can be disclosed under SFDR.
- KPI 10: We have had multiple stakeholders comment on the issue around ambiguity in floor area metric to use and the need to align as an industry on this. We have specified the use of EPBD / EPC calculation as a base framework to align to, to maintain consistency with the wider proposal. We have specified GIA as the metric to use for energy intensity with accompanying narrative for this. We have further specified the use of IPMS as a standard in determining floor area for energy intensity as this has been flagged by multiple stakeholders as the best available source to align on GIA measurement. Further specified that when measured energy intensity is used, this should utilise the same formula as KPI 9 to account for incomplete data coverage.

Endnotes

1 Commission Recommendation (EU) of 29 July 2016 on guidelines for the promotion of nearly zero-energy buildings and best practices to ensure that, by 2020, all new buildings are nearly zero-energy buildings. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016H1318&rid=10#:~:text=The%20nearly%20zero%20or%20very,are%20nearly%20zero-energy%20buildings.

2 ZEBRA2020 Data Tool for Energy Efficiency trends in buildings. Specifically, nZEB Buildings/Non residential buildings/Primary energy demand using the value provided from the nearest nation with data available. https://zebra-monitoring.enerdata.net/

3 https://www.inrev.org/system/files/2024-04/INREV-Sustainable-Investment-Principles-2024_1.pdf

4 As defined by IWA 42:2022 - https://www.iso.org/obp/ui/#iso:std:iso:iwa:42:ed-1:v1:en

5 https://www.crrem.org

6 https://www.inrev.org/system/files/2024-04/INREV-Sustainable-Investment-Principles-2024_1.pdf

7 https://www.energy.gov/sites/default/files/2024-06/bto-national-definition-060524.pdf requir

8 221219 Draft Commission notice on EUT, Section 145

9 https://www.ashrae.org/technical-resources/bookstore/standard-100. NB although this is a Tier 5 source, this is inexpensive and readily accessible and not deemed a large barrier

10 https://www.inrev.org/system/files/2024-04/INREV-Sustainable-Investment-Principles-2024_1.pdf

11 AREF. Guidance Advise: Application of SFDR Process for Real Estate Funds. https://www.aref.org.uk/uploads/assets/f573e1c1-92df-4c51-adab9750fe95ccea/SFDR-Guidance-for-FundsFINAL.pdf

12 Commission Delegated Regulation (EU) 2020/1818 of 17 July 2020 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks; https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1818

13 SFDR Real Estate Solutions Paper: Proposals for solving challenges arising from SFDR for real estate investments. https://www.esma.europa.eu/system/files/webform/200622/94825/SFDR_Real_Estate_Solutions_Paper_7_June_2023.pdf

14 See Para 171 - https://ec.europa.eu/finance/docs/law/221219-draft-commission-notice-eu-taxonomy-climate.pdf

15 Noting that as stated by INREV *"According to the final report on the draft Regulatory Technical Standards (RTS), assets are deemed inefficient if they have an EPC rating of D or worse, or a PED that does not rank within the top 30% nationally. This is a proposed change from the previous criteria set by [ESMA], which considered an EPC rating of C or below as inefficient. These latest proposed regulatory changes are anticipated to take effect mid-2025."* (https://www.inrev.org/system/files/2024-04/INREV-Sustainable-Investment-Principles-2024_1.pdf). If/once this change is adopted, the proposed definition would be updated accordingly.

16 https://www.inrev.org/system/files/2023-01/AREF_BPF_CREFCE_INREV_IPF_PFP_TGE%20Working%20Group%20Submission%20to%20FCA_TCFD_ISSB%20Proposals%20ESG%20Metrics%20for%20Real%20Estate_12%20January%202023.pdf

17 https://www.epra.com/application/files/4617/1567/8076/EPRA_sBPR_Guidelines_Fourth_Edition.pdf

18 https://www.inrev.org/library/implementing-net-zero-carbon-strategy

19 https://www.inrev.org/system/files/2023-01/AREF_BPF_CREFCE_INREV_IPF_PFP_TGE%20Working%20Group%20Submission%20to%20FCA_TCFD_ISSB%20Proposals%20ESG%20Metrics%20for%20Real%20Estate_12%20January%202023.pdf

20 https://ipmsc.org/wp-content/uploads/2023/01/ipms-all-buildings-.pdf

21 https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM2_Setting_up_a_project_to_use_Level(s)_v1.1_26pp.pdf

22 https://www.crrem.org (See FAQ 'What is the "basis" of the Floor area that should be used?)