

# Carbon Risk Real Estate Monitor *Initiative*



## Governance of the CRREM-Initiative

This initiative has received funding from the  
Laudes Foundation.



## Introduction

This document describes the governance arrangement for the Carbon Risk Real Estate Monitor (CRREM) initiative. It is intended to provide transparency to a wider audience on how CRREM is governed and how decisions are taken. It is also the agreed guide for the CRREM initiative partners for how they engage with CRREM and what their rights and responsibilities are. The content was unanimously agreed by the initial CRREM partners at a meeting on 19. January 2021. In the document there are references to other documents that explain some processes in some more detail and these are available on request.

Any question regarding the content of this document should be addressed to [crrem@iioe.at](mailto:crrem@iioe.at).

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# Our Governance

How is the CRREM initiative governed?

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# CRREM GOVERNANCE STRUCTURE





## A.1 CLIMATE TRANSITION TARGETS

Addressing the urgent challenge of climate change is more pressing than ever. Global man-made **climate change poses a fundamental threat** to places, species and mankind. It is therefore a **serious risk to sustained economic growth** and poverty reduction, quality of life and political stability around the world. **A dramatic reduction of greenhouse gas emissions (GHG)** is required to address this crisis and avoid more negative consequences of global warming in the future.

At the 21<sup>st</sup> *Conference of the Parties of the UNFCCC*<sup>1</sup> in Paris (COP21 / 'Paris Conference'), representatives of 196 countries developed the so-called **Paris Agreement** in 2015. Until now the agreement has been signed by 197 nations and 191 countries have become an official party. It defines a common framework regarding GHG emissions, adaptation and finance starting in 2020. The main target of the treaty is to **limit global warming to 1.5 °C** (or at least well below 2°C) compared to the pre-industrial level.

According to latest studies published by *International Energy Agency* (IEA) there is a very **limited remaining budget of anthropogenic (human-caused) carbon emission until the end of the century** - resulting in a high probability of limiting global warming to 1.5°C maximum if emissions stay within the stated budget. In order to accomplish this target, all sectors will need to decarbonize and together reach net zero emissions by 2050.

The **real estate sector is accountable for more than 30% of the energy consumption and GHG emissions globally** and therefore plays a crucial role in decarbonization efforts stated in the NDCs (Nationally Determined Contributions) which countries submitted to the UNFCCC secretariat according to the Paris agreement. Poor energy efficiency of the global real estate stock and low refurbishments rates are among the key obstacles to achieve the ambitious decarbonization targets laid out in the Paris Agreement.

Since all anthropogenic CO<sub>2e</sub> emissions<sup>2</sup> have to reach almost zero around 2050, **clear, reliable, scientific and granular decarbonization pathways** for the participating countries and all economic sectors – including real estate – are needed in order to provide clear guidance for market participants.

## A.2 INITIATIVE & BACKGROUND

The *Carbon Risk Real Estate Monitor initiative* (CRREM) provides real estate investors, managers, occupiers and other stakeholders globally with a **clear Paris-aligned direction to set and control ambitious 1.5 degree aligned decarbonization targets** in order to stay in the downscaled "fair share" of the GHG budget for real estate in the use phase (**operational emissions**).

**CRREM is and will remain a not-for-profit-initiative** operated by the IIÖ GmbH, Institute for real estate economics<sup>3</sup>, initiated by IIÖ, APG Asset Management (APG), PGGM and Norges Bank Investment Management (NBIM). IIÖ GmbH carries out the operative work of CRREM under Prof. Dr. Sven Bienert, MRICS REV, its managing director. CRREM initiative is furthermore supported by *GRESB Foundation*, Japan's *Government Pension Investment Fund* (GPIF) and *Ivanhoé Cambridge*. CRREM initiative has its roots in an EU funded project. Currently CRREM trademark is registered in Austria. The non-profit initiative is not yet legally registered as a separate organisation.

<sup>1</sup> UNFCCC United Nations Framework Convention on Climate Change, 2015.

<sup>2</sup> CO<sub>2e</sub> stands for so-called CO<sub>2</sub>-equivalents, including the effect of non-CO<sub>2</sub> greenhouse gases on global warming. // GHG: greenhouse gas.

<sup>3</sup> Address: Josef-Steinbacher-Straße 1, Austria - 6300 Wörgl, Managing Director: Prof. Dr. Sven Bienert MRICS REV

CRREM is **aligned with the leading international accounting and reporting frameworks, disclosure guidelines and recommendations** published by initiatives working within the **field of decarbonization and real estate**.

Amongst others CRREM is collaborating with The SBTi, PCAF, NZAOA, IIGCC, ULI Greenprint, INREV, CPD, UNEP FI, CBI, WGBC and many others (see full list in appendix). CRREM's global pathways and the tool are **used worldwide by investors, asset managers and other stakeholders**. The list (see appendix) of industry partners supporting the CRREM "Global industry committee" is just a fraction of the organizations using CRREM resources to date.

The development of the global pathways and all additional resources produced after the funding from the EU project expired (see details under [www.crrem.org](http://www.crrem.org) and [www.crrem.eu](http://www.crrem.eu)) were financially supported by PGGM, APG, NBIM and from 2020 onwards also the Laudes Foundation.

## A.3 MISSION

The CRREM initiative works to support long-term value creation of the build environment and has the following main objectives

- **Increase transparency** regarding country and use-type specific **decarbonization requirements** that are aligned with the Paris Climate Agreement and latest scientific evidence for real estate.
- Encourage adoption of the Paris-aligned decarbonization targets and support real estate investors, occupiers and asset managers in **measuring and reducing their operational carbon footprint** on property and portfolio level with software tools, new methods and scientific reports.
- Support **global harmonization** of decarbonization initiatives within the real estate sector.
- Ensure **higher awareness for transition risk** within the real estate industry with various dissemination activities.

An overview of CRREM's work program for 2022-24 can be found in the Annex.

## A.4 PARTNERS

Below is a list of the Partners of the CRREM Initiative (a brief description can be found in the Annex). They include three investors that are funders and Partners, and IIO which is CRREM's operating Partner. The Partners jointly own the intellectual property rights of the global decarbonization pathways developed. The funding Partners participate in the initiative to support CRREM's mission and without the intention of deriving any direct material gain for themselves. They abide by the agreed rules of engagement which include the declaration of any conflict of interest or conflict of duty that may arise. Each Partner has the right and duty to fully participate in the CRREM Steering Group (SG) with one voting representative (see Section A.6.1) They may decide to add additional organisations as Partners through the process described below.

**IIO**  
INSTITUTE FOR REAL ESTATE  
ECONOMICS

Institut für Immobilienökonomie / Institute for Real Estate Economics  
(IIO, Austria)  
*Sven Bienert (Managing Director)*

**APG Asset Management***Derk Welling (Senior Responsible Investment & Governance Specialist)***PGGM***Maarten Jennen (Senior Director - Strategist Private Real Estate)***NBIM***Christopher Wright (Sustainability Manager, Real Asset Risk)*

## A.5 FUNDING

CRREM was initially a research project (02/2018-01/2021) funded by the **European Commission** under the Horizons 2020 programme (grant agreement no. 785058). The first decarbonization pathways for European commercial real estate only and the tool was developed by the Austria-based *Institute for Real Estate Economics (IÖ)*, with *GRESB* and other organizations and universities participating in the former EU project.

The Global pathways and all resources referring to residential properties as well as all updates of the pathways and additional reports & material were originally funded by APG, NBIM and PGGM in 2019. Since 2021 CRREM has been jointly funded by a grant from the **Laudes Foundation** as well as separate grants from **APG, PGGM and NBIM**. The funding will be adapted to the future business model. The development of global decarbonization pathways by CRREM will remain scientifically robust and independent of any commercial interests.

The initiatives' work generally is not-for-profit and all resources of the CRREM initiative are available free of charge for investors, property owners and asset managers on [www.crrem.org](http://www.crrem.org) as well as [www.crrem.eu](http://www.crrem.eu). Bespoke services provided to individual market participants or resources used by companies creating derived products or other services might be charged a fee. In addition, a licence agreement to use CRREM resources for derived products (which are offered by third parties and not free of charge) might be needed.

## A.6 GOVERNANCE STRUCTURES

CRREM is governed by four different structures, each filling a specific function. The initiatives structures and governance layer are addressing the following aspects:

- To help with increased transparency,
- To improve feedback processes,
- To help with global reach and applicability,
- To facilitate stakeholder engagement.

The layers are the **Steering Group (SG)**, the **Global Scientific Committee (GSC)** and the **Global Industry Committee (GIC)** and **Regional Advisory Groups (RAGs)**. Members of all committees participate voluntarily on the basis of an invitation to join, and do not receive a salary. Only the head of the GSC will receive a compensation for his/her role and the workload resulting thereof. This section describes the initiative's governance as follows:

- A Steering Group – composed of CRREM funding partners and observers, and responsible for strategic direction and oversight of the Initiative.
- A Global Scientific Committee – composed of up to 10 individuals, to guarantee scientific excellence and ensure quality assurance for all results.
- A Global Industry Committee – composed of around 60 individuals, NGOs, initiative and company representatives, to ensure direction and industry feedback can be adequately captured and scrutinizing methodological process and functional specifications.
- CRREM Initiative's staff – being responsible for the delivery / execution of the defined work program.

In addition, a separate group of **licence agreement partners, accredited data partners and auditors** will be announced in due course.

Furthermore, to the quality assurance of results the committees are also dealing with organisational and campaign issues which get agreed upon at biannual meetings. Decisions on wide-ranging strategic and high-level campaign areas are agreed upon in these committees.

In its role, the SG is supported by two committees, the GSC and the GIC. The "Terms of Reference" of the GSC and the GIC are decided on by the SG.

All CRREM results (tool, pathways and reports) are developed with a clear **focus on scientific reliability and robustness**. After **internal quality assurance** the results are further developed with the oversight of the two committees. Partners and members of the GSC and the GIC can suggest changes to the output and suggest further scientific input. Results should undergo a **public consultation phase** and feed-back will be incorporated in a structured way. Both committees are supporting the progress towards achieving the mission and objectives of CRREM. It is the guarantor of the integrity of the initiative and ensures adherence to internationally accepted good governance and management standards.

Members of the GSC and the GIC serve for a term of three years, with an optional extension subject to mutual consent. New Committee members have to be nominated by either other participants of the respective committee and/or the Partners of the CRREM initiative. The existing committee will admit new members through a majority vote. All committee members will agree to the "Terms of reference". All expert or interested investor/ organizations/ persons can apply via mail to join RAGs. The application shall be clear on the motivation and qualification. Approval of the participation will be decided by the SC.

## I) STEERING GROUP (SG)

The SG is composed of the CRREM Partners and Observers. IIO, the operating Partner, acts as chair of the SG. The SG is responsible for providing strategic direction and oversight to the CRREM initiative. The SG takes decisions on the future developments of CRREM and decides on the hosting arrangements of the initiative. The SG will also decide on the need and establishment of any new financial resources and budgets.

It will maintain a MoU with the hosting organisation (currently IIO) and will agree to delegate fiduciary responsibilities to that organisation as needed. IIO will at least remain the hosting organisation until the current Laudes Grant expires. Also, the recruitment process and decision for additional staff is delegated to the operating Partner.

The Partners are represented in the SG by one voting representative each. There is also a wider group of organizations in the SG that are CRREM Observers. Observers do not have voting rights and will not participate in decision-making. Each Partner and Observer identifies one person as the representative in the SG. Membership is organisational and not personal. The members of the SG provide oversight of CRREM and have endorsed this document.

The SG can decide to welcome additional observers to their meetings. There are only two permanent observers (to date GPIF and Ivanhoe C.). The SG will take decisions by simple majority and will strive for consensus to the extent possible.



Some decisions will require a qualified majority. The quorum of any SG meeting where decisions are being made will be 50% + 1. The SG will appoint a person to chair their meetings on an annual basis and the convening of meetings will be ensured by IIÖ chairing the SG.

The SG can admit additional Partners by a decision of a three-quarter majority. The SG may invite an organisation to become a CRREM Partner based on the strategic priorities of CRREM's mission, and will not consider unsolicited requests. The requirements for becoming a Partner are established by the SG and can be changed from time to time.

A three-quarter majority vote is required for changing the mission of CRREM, for significantly changing its fiscal/legal hosting arrangement, and for establishing an entity in the name of CRREM.

Any cost associated with the participation in the SG will be carried by each Partner.

The SG is responsible for ensuring that CRREM publicly discloses the key information relevant to the initiative. This includes but is not limited to:

- The structure of CRREM, including key governance documents
- The hosting arrangement of CRREM
- The funding streams and financial results of CRREM
- The details of the business model and budgeting of CRREM
- Any agreed standards and policies
- Any agreements on MoUs with other related organizations
- Licence agreements for companies using CRREM resources to produce derived products
- Complaint's procedures

## II) GLOBAL-SCIENTIFIC-COMMITTEE (GSC)

The CRREM "*Global Scientific Committee*" (*GSC*), comprised of carefully selected academic experts with backgrounds in real estate and environmental sustainability across European, North American, and Asian markets. There are three main reasons for why there's a need for a Global Scientific Committee:

- CRREM is based on Global sectorial pathways that change over time. Understanding how these pathways are changing is critical to ensure CRREM is globally accurate. The Global Scientific Committee's work is to review these pathways, and continuously review the key CRREM algorithm that defines how these pathways should be translated into the built environment.
- CRREM produces country level pathways. The Committee would review the outcomes of each countries' pathways to make sure they are sensible and realistic and provide feedback and advice to the Initiative for changes to them when they are not.
- CRREM also relies on having access to a diverse amount of data across multiple countries, and ensure this data is accurate and up to date. The Global Scientific Committee would verify selected data points, monitor progress in each country and make recommendations for adjustments as needed

Especially on the last two aspects the GSC also strongly depends on input from the CRREM data regional partners, GIC feedback as well as RAGs input.

It will be composed of 6-11 members and will be diverse in terms of gender, geography and background. The GSC can select a Head of the committee (see Annex). The group strives towards consensus votes but – if that is not possible - by majority vote.

## III) GLOBAL-INDUSTRY-COMMITTEE (GIC)

The CRREM “**Global Industry Committee**” (**GIC**) consists of the main global industry bodies and leading investors, asset managers and IT companies. The methodological process and functional specifications of CRREM is regularly scrutinised by the GIC. The GIC has been set up to guide project development, enhance alignment with investors’ requirements and ensure that CRREM’s outcome is fit-for-purpose. Altogether more than 60 representatives of a broad variety of organisations form this committee (as of 30.09.2022).

The initiative will set processes to ensure this Committee can function appropriately. This will include having reference groups in different regions led by members of the Global Industry Committee. To avoid regional-centric /selective views in their representation, in addition **Regional Advisory Groups (RAGs)** will be established for America, Asia-Pacific, Europe and potentially other regions.

The group strives towards consensus votes but – if that is not possible - by majority vote.

### A.7 DISPUTE RESOLUTION

Any dispute should in the first instance be settled between the parties involved. If that is not successful, the following process will guide the settlement of a dispute.

A dispute between members in the committees will be raised with the chair of the SG who will inform the SG members and decide on an appropriate process.

A dispute between a committee and the SG that cannot be settled will be referred to an external mediator that both parties agree on.

A dispute between two Partners concerning the CRREM initiative will be referred to the chair of the SG. If the chair is not able to settle the dispute, or if the chair is party to the dispute, an external mediator will be agreed by the parties of the dispute.

A dispute between the SG and the hosting organisation will be referred to a mediator registered in the jurisdiction of the hosting organisation.

### A.8 REFERENCE AND USE OF CRREM AS NAME AND BRAND

We encourage any market participant engaged in the accounting and target setting of GHG-emissions within the real estate industry to use CRREM resources and especially the CRREM-global-pathways. In order to avoid green-washing we ask market participants to rely on location-based emission factors whenever possible.

We would like to stress that the CRREM tool and pathways are following the so-called whole-building-approach (and therefore include all consumption data including tenant space). Please make sure that your alignment follows the steps laid down in the [“Reference Guide”](#).

We encourage market participants to set ambitious climate targets. For operational decarbonization pathways we recommend our global pathways. **You can use the following options in your communication and annual (sustainability) reports including the CRREM logo:**



**Option 1** (self-declared): compulsory “We are using the CRREM (*select “1.5 °C”*)<sup>4</sup> pathways to align (select “our entire real estate portfolio” or “part of our real estate portfolio”) against the Paris-compliant-decarbonization-pathways provided by CRREM (reporting “year”). To date “percentage” % of our assets are compliant with these targets in “year of reporting”. Without further measures “percentage” % of our assets will be compliant with these targets in 2050. To achieve full decarbonization of our portfolio by “date/year – latest year is “2050” we will “individual wording regarding planned measures””.

**Option 2** (third party checked by “name of consultant/auditor”): Same statement as above

**Option 3** (checked by CRREM-team): Same statement as above

The use of all CRREM resources for asset owners is free of charge. If you are referring officially to CRREM in your company documentation you are asked inform the CRREM team about this. Entities will be displayed with their name only on our website.

Further, also data providers, consultants, IT companies etc. may only use the CRREM brand/name if accredited by CRREM initiative for derivative products. For this we will agree with those companies on a licence agreement, resulting in the possibility to use the statement “accredited CRREM partner”

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<sup>4</sup> Note: CRREM also offers a 2-degree pathway. However, we only recommend the more ambitious trajectory for Paris-alignment.

**ANNEX**



## 1. BRIEF DESCRIPTION OF PARTNERS AND SUPPORTERS

### About APG Group NV

APG is the largest pension provider in the Netherlands; its approximately 3,000 employees provide executive consultancy, asset management, pension administration, pension communication and employer services. APG performs these services on behalf of (pension) funds and employers in the sectors of education, government, construction, cleaning and window cleaning, housing associations, energy and utility companies, sheltered employment organizations, and medical specialists. APG manages approximately EUR 560 billion (as of June 2020) in pension assets for the pension funds in these sectors. APG works for approximately 22,000 employers, providing the pension for one in five families in the Netherlands (approximately 4.7 million participants). APG has offices in Heerlen, Amsterdam, Brussels, New York and Hong Kong. For more information see [www.apg.nl/en](http://www.apg.nl/en).

### About PGGM

PGGM is a cooperative Dutch pension fund service provider. Institutional clients are offered asset management, pension fund management, policy advice and management support. On December 31, 2019 PGGM had EUR 252 billion in assets under management and was administering pensions of 4.4 million participants. Around 750,000 workers in the Dutch healthcare are connected to PGGM&CO, its members organization. Either alone or together with strategic partners, PGGM develops future solutions by linking together pension, care, housing and work. For more information see [www.pggm.nl](http://www.pggm.nl).

### About Norges Bank Investment Management

Norges Bank Investment Management manages the Government Pension Fund Global according to a mandate set by the Norwegian Ministry of Finance. The mission is to safeguard and build assets for future generations. Ultimately, the fund's assets are held by the government on behalf of the Norwegian people. The Ministry determines the fund's investment strategy, following discussions in Parliament. The fund is invested 70.8 percent in equities, 26.5 percent in fixed income and 2.7 percent in unlisted real estate. The fund's annualised return since the start of 1998 is 6.1 percent measured in a currency basket. Assets under management are USD 1 trillion. For more information see [www.nbim.no](http://www.nbim.no).

### About IIÖ Institute for Real Estate Economics

The IIÖ Institute for Real Estate Economics has a successful track record in the fields of research, valuation as well as strategy and transaction consulting for private and public customers. [Professor Sven Bienert](#), Founder and Managing Director of IIÖ, has been involved in the development of national and international valuation standards. Prof. Bienert has a chair for sustainable real estate at the University of Regensburg (IRE | BS International Real Estate Business School). Besides that, he was Managing Director for Probus Real Estate GmbH headquartered in Vienna (approx. 2.1 Bn. AuM), is appointed to the supervisory board of the ZIMA Holding AG and the Immofinanz AG as well as on the board of numerous real estate associations like DGNB, ZIA, ICG or DVFA. Together with Jens Hirsch, Julia Wein and Maximilian Spanner, he has authored many scientific and non-scientific publications on the topic of sustainable real estate, especially focussing on extreme weather events and transition risk. IIÖ is leading the CRREM project that develops Paris-aligned decarbonization pathways for the global real estate sector.



### About GPIF

As a Japanese public pension fund, Government Pension Investment Fund manages the reserve fund for beneficiaries with the mission of securing long-term returns with minimal risk. With approximately US\$1.4 trillion currently under management and a globally diversified portfolio, GPIF outsources 100 percent of equity and most of its bond investment to external asset managers.

As a universal owner, GPIF is committed to making the capital market sustainable by integrating ESG factors into investment and expecting sustainable returns with a long-term horizon. For more information see [www.gpif.go.jp/en/](http://www.gpif.go.jp/en/).

### About Ivanhoé Cambridge

Ivanhoé Cambridge develops and invests in high-quality real estate properties, projects and companies that are shaping the urban fabric in dynamic cities around the world. It does so responsibly, with a view to generate long-term performance. Ivanhoé Cambridge is committed to creating living spaces that foster the well-being of people and communities, while reducing its environmental footprint.

Vertically integrated in Canada, Ivanhoé Cambridge invests internationally alongside strategic partners and major real estate funds that are leaders in their markets. Through subsidiaries and partnerships, the Company holds interests in more than 1,000 buildings, primarily in the industrial and logistics, office, residential and retail sectors. Ivanhoé Cambridge held C\$64 billion in real estate assets as at December 31, 2019 and is a real estate subsidiary of the Caisse de dépôt et placement du Québec (cdpq.com), one of Canada's leading institutional fund managers. For more information see: [www.ivanhoecambridge.com](http://www.ivanhoecambridge.com).

## 2. OVERVIEW OF WORK PROGRAM (2022-2024)

Climate change will endanger the business case of real estate companies if no measures to transform and decarbonize the property stock under management are taken. Therefore, a stronger **focus on climate change risk management** is essential. A company strategy and risk management must ensure that individual efforts to **mitigate CO<sub>2</sub>e** within their portfolio must be sufficient to **fulfil Paris targets** – otherwise the market participant might face a situation where properties do not meet future market expectations and / or regulatory requirements and therefore will be exposed to write-downs (so-called “Stranded assets”). One of the biggest challenges in the reduction of GHG emissions results from the poor energy efficiency of existing buildings and still too low refurbishment rates in virtually all countries around the globe. The reduction of the global carbon footprint requires a significant **increase of energetic retrofits in the existing property stock**. The CRREM initiative’s main objective is to support and enable this necessary transition. We aim at supporting the industry to tackle these risks and foster investments in energy efficiency.

The CRREM initiative has developed a tool that allows investors and property owners to assess the exposure of their assets to transition risks based on energy and emission data and the analysis of decarbonization requirements in order to be aligned with the Paris-targets over time. By deriving science-based carbon reduction pathways, the CRREM initiative created a norm for all major usage types and for the largest real estate hubs globally.

### CRREM-RESOURCES ARE AVAILABLE FREE-OF-CHARGE FOR ALL MARKET PARTICIPANTS:

- [www.crrem.eu](http://www.crrem.eu): CRREM decarbonization Tool as well as various reports, guidelines and background information.
- [www.crrem.org](http://www.crrem.org): CRREM global decarbonization pathways:
  - For 1.5 °C (and 2.0 °C) alignment, offering
  - Carbon-intensities and Energy-intensities, which were differentiated according to
  - Countries and use-types.

Note that in order to maintain updated pathways and cover the costs of the initiative CRREM charges in the case companies officially want to refer in their e.g., annual reports to CRREM and register their compliance with CRREM pathways officially.

### THE CRREM INITIATIVE KEEPS ON DEVELOPING FURTHER MATERIAL, METHODS AND TOOLS TO FOSTER DECARBONIZATION IN THE REAL ESTATE INDUSTRY. CURRENT RESEARCH AREAS ARE:

- Annual updates of the global decarbonization pathways
- Global harmonization of standards and approaches relating to decarbonization of real estate,
- Trade-off between embodied carbon of retrofit measures and operational savings,
- Deriving marginal abatement costs of energetic retrofits to optimise investment decisions,
- Importance and effects of F-gases for the overall CO<sub>2</sub>e-footprint of buildings,
- Projects applying the Tool and pathways globally,
- Dissemination activities related to decarbonization / transition risk and real estate,
- Reporting standards and guidance documents for operation carbon measurement.

### 3. MEMBERS OF THE GLOBAL INVESTORS COMMITTEE

THE CRREM INITIATIVE GRATEFULLY ACKNOWLEDGES THE SUPPORT AND ADVICE RECEIVED FROM THE  
GLOBAL INDUSTRY COMMITTEE

#### INSTITUTIONAL INVESTORS & CORPORATE PARTNERS

<b>Aberdeen Standard</b> Ruairi Revell ( <i>ESG Manager, Real Estate</i> )	<b>Land Securities</b> Fernanda Amemiya ( <i>Sustainability Reporting Manager</i> )
<b>AEW Europe</b> Thierry Laquitaine ( <i>Head of Socially Responsible Investment</i> )	<b>IVANHOECAMBRIDGE</b> Stephen Villemain
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<b>BNP Paribas Real Estate Consult</b> Hermann Horster ( <i>Regional Director, Head of Sustainability</i> )	<b>Nordea Life &amp; Pension</b> Peter Sandahl ( <i>Head of Sustainability</i> )
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<b>Haven Green Capital Partners</b> Josien Piek ( <i>Partner</i> )	

## INDUSTRY BODIES AND NETWORKS

<b>BBP Better Buildings Partnership</b> Adam Smith ( <i>Programme Manager</i> )	<b>INREV</b> <b>European Association for Investors in Non-Listed Real Estate Vehicles</b> Federica Miano ( <i>Public Affairs Manager</i> ) Bahar Celik ( <i>ESG Analyst</i> )
<b>BRE Group</b> Christine Pout ( <i>Principal: Net Zero Solutions</i> )	<b>UNEP FI</b> David Carlin ( <i>TCFD and Climate Risk Program Lead</i> )
<b>CDP</b> Alberto Carrillo Pineda ( <i>Director Science Based Targets and Renewable Energy</i> )	<b>ULI Greenprint Center for Building Performance</b> Marta Schantz ( <i>Senior Vice President</i> )
<b>DGNB German Sustainable Building Council</b> Anna Braune ( <i>Director Research and Development</i> )	<b>EPRA European Public Real Estate Association</b> Shintaro Yanagi ( <i>ESG Manager</i> )
<b>DGBC Dutch Green Building Council</b> Martin Mooij ( <i>Head of Certification and Project manager DGBC Deltaplan sustainable renovation</i> )	<b>Finance Ideas</b> Vincent van Bijleveld ( <i>Director ESG</i> )
<b>EEFIG De-risking Energy Efficiency Platform</b> Carsten Glenting ( <i>Head of Strategy, Finance, and Economics</i> )	<b>CREFC Europe</b> Peter Cosmetatos ( <i>CEO</i> )
<b>GBC Australia</b> Jorge Chapa ( <i>Head of Market Transformation</i> )	<b>World Green Building Council</b> Stephen Richardson ( <i>Technical Lead - Energy Efficiency Mortgages</i> )
<b>Guidehouse / PCAF</b> Giel Linthorst ( <i>Associate Director</i> )	<b>ZIA German Property Federation</b> Philipp Matzke ( <i>Consultant Energy and Climate Protection, Facilities Engineering</i> )
<b>SBTi</b> Karl Downey ( <i>Senior Technical Manager</i> )	<b>Inrev</b> Luc Van de Boom ( <i>ESG Expert</i> )
<b>MSCI</b> Dan Carson ( <i>Lead, Real Estate Climate Product Strategy</i> )	<b>GRESB</b> Erik Landry ( <i>Climate Change Specialist</i> )
<b>NAREIT</b> Fulya Kocak Gin ( <i>Senior Vice President, ESG Issues</i> )	<b>E-CORE</b> Markus Bell ( <i>Managing Director, Bell Management Consultants</i> )
<b>Laudes</b> James Drinkwater ( <i>Head of Built Environment</i> )	<b>UKGBC</b> Emily Huynh ( <i>Senior Advisor</i> )
<b>OECM Building Pathways</b> Sven Teske ( <i>Research Director at Institute for Sustainable Futures, University of Technology, Sydney</i> )	<b>Madaster</b> Patrick Bergmann ( <i>Managing director</i> )
<b>Climate Finance Advisors</b> Matthew Ulterino ( <i>Director</i> )	

## 4. MEMBERS OF THE GLOBAL SCIENTIFIC COMMITTEE

THE CRREM INITIATIVE GRATEFULLY ACKNOWLEDGES THE SUPPORT AND ADVICE RECEIVED FROM THE  
GLOBAL SCIENTIFIC COMMITTEE

### ACADEMICS

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The GSC is (as of 31.12.2021) comprised of the following members:

1. Dr. Jens Hirsch, Head of the CRREM GSC and Head of Sustainability & Scientific Research at *BuildingMinds*,
2. Dr. Georgia Warren-Myers, Associate Professor in Property at the *Melbourne School of Design*,
3. Prof. Andy van den Dobbelsteen (PhD MSc), Professor of Climate Design & Sustainability at the *Delft University of Technology*,
4. Dr. Paul Mathew, Staff Scientist and Department Head of Whole Building System at the *Lawrence Berkeley National Laboratory (LBNL)*,
5. Prof. Pengjun Zhao, Professor at the Department of Urban and Regional Planning of the *Peking University*,
6. Prof. Norman Miller (PhD MS), Hahn Chair of Real Estate Finance at the *University of San Diego (USD)*,
7. Prof. Joseph T.L. Ooi, Vice Dean School of Design and Environment, Deputy Director Institute of Real Estate and Urban Studies, Programme Director Executive Certificate in Real Estate Finance (ECREF) at the *National University of Singapore*,
8. Mrs. Christa Clapp, Co-founder and Managing Partner, CICERO Shades of Green Ltd., Head of Climate Finance, CICERO,
9. Prof. Franz Fürst (Professor of Real Estate and Urban Economics), University of Cambridge, and
10. Hans Vrensen (Head of Research & Strategy), *AEW Europe*.