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Review of institutional investors' climate related actions and targets in Finnish building stock during years 2017-2019

Final report

31.1.2021

Gaia Consulting Oy

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1 Introduction

This review is produced as part of WWF's LIFE EconomisE project. The project aims at reducing emissions in collaboration with building owners, institutional investors, cities and municipalities. The project started in June 2017 and ends in January 2021. The target of the project is to demonstrate how influencing financial flows for the decarbonisation of building stock can deliver significant contributions towards 2020 and 2030 Climate and Energy targets, with special emphasis placed on working within the Paris Agreement's temperature goals of 1.5/2°C.

The project is coordinated by WWF Finland and implemented in partnership with the Finnish Environment Institute (SYKE) and the Environmental School of Finland (SYKLI). It is partly funded by the EU's LIFE Climate Governance and Information.

WWF has asked Gaia Consulting to conduct the assessment of the realised savings and improvements in the building stock under management by the institutional investors during the project. The realised savings and the targets of institutional investors will be evaluated against the Paris Agreement's temperature goals.

The assessment is based on interviews and analysis conducted by WWF which was complemented further with two interviews implemented by Gaia Consulting.

2 Review of changes in regulation since 2018

EU legislation related to Energy

In order to respond to the challenge to meet the Paris Agreement goals and continue to lead the global energy transition, the EU has adopted a set of ambitious new rules, defining the legislative parameters for the coming years, but also enabling the necessary investment. This framework is called the "Clean Energy for All Europeans" package[1].

The framework "Clean Energy for All Europeans" package consists of following key regulation and directives. The key regulation and date of adoption is listed in the table below.

Regulation	The European Council Adoption	Official Journal Publication	Member States shall bring into force this Directive/Regulation
Energy Performance in Buildings	14/05/2018	19/06/2018 – Directive (EU) 2018/844	by 10 March 2020
Renewable Energy	04/12/2008	21/12/2018 – Directive (EU) 2018/2001	by 30 June 2021
Energy Efficiency	04/12/2018	21/12/2018 – Directive (EU) 2018/2002	by 25 June 2020
Electricity Regulation	22/05/2019	14/06/2019 – Regulation (EU) 2019/943	shall apply from 1 January 2020
Electricity Directive	22/05/2019	14/06/2019 – Directive (EU) 2019/944	from 1 January 2021

The package is composed primarily of the following elements:

1) **Energy efficiency first**: the revamped directive on energy efficiency sets a new, higher target of energy use for 2030 of 32.5%, and the new Energy performance of buildings directive maximizes the energy saving potential of smarter and greener buildings.
2) **More renewables:** an ambitious new target of at least 32% in renewable energy by 2030 has been fixed, with specific provisions to foster public and private investment, in order for the EU to maintain its global leadership on renewables.
3) **A better governance of the Energy Union**: A new energy rulebook under which each Member State drafts National Energy and Climate Plans (NECPs) for 2021-2030 setting out how to achieve their energy union targets, and in particular the 2030 targets on energy efficiency and renewable energy.

[1] https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en

4) **More rights for consumers:** the new rules make it easier for individuals to produce, store or sell their own energy, and strengthen consumer rights with more transparency on bills, and greater choice flexibility.
5) **A smarter and more efficient electricity market:** the new laws will increase security of supply by helping integrate renewables into the grid and manage risks, and by improving cross-border cooperation.

The Energy Performance in Buildings Directive (EPBD), The amended Energy Efficiency Directive and The Renewable Energy Directive are described in more detail in appendix 1.

EU Energy Union Strategy

The EU's energy union strategy is made up of five dimensions (i.e. energy security; the internal energy market; energy efficiency; decarbonisation of the economy; and research, innovation and competitiveness). EU countries are required to develop integrated national energy and climate plans (NECP) that cover these five dimensions for the period 2021 to 2030.

In November 2018, the Commission presented its strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy by 2050 – "A Clean Planet for All". The road to a climate neutral economy would require joint action in seven strategic areas

1) energy efficiency
2) deployment of renewables
3) clean, safe and connected mobility
4) competitive industry and circular economy
5) infrastructure and interconnections
6) bio-economy and natural carbon sinks
7) carbon capture and storage to address remaining emissions

European Green Deal

The European Green Deal[2] that sets out a detailed vision to make Europe the first climate-neutral continent by 2050. The European Commission published in October 2020 the Renovation Wave Strategy to improve the energy performance of buildings. Buildings are responsible for about 40% of the EU's energy consumption, and 36% of greenhouse gas emissions from energy. But only 1% of buildings undergo energy efficient renovation every year, so effective action is crucial to making Europe climate-neutral by 2050. The aim is to at least double renovation rates in the next ten years and make sure renovations lead to higher energy and resource efficiency.

The Renovation Wave Strategy will promote stronger regulations, standards and information on the energy performance of buildings to set better incentives for public and private sector

[2] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

renovations, including a phased introduction of mandatory minimum energy performance standards for existing buildings, updated rules for Energy Performance Certificates.

As part of the European Green Deal, the European Commission plans a potential revision of the EU energy performance of buildings directive (EPBD), the EU renewable energy directive (RED) and the EU energy efficiency directive (EED) to help deliver on the EU's increased climate ambition for 2030 and 2050.

EU Climate Law proposal

On 4 March 2020, the European Commission adopted its proposal for a European climate law[3], as an important part of the European Green Deal. The proposed law (amending the Regulation (EU) 2018/1999, European Climate Law regulation) includes a climate target which specifies a binding climate-neutrality objective for the whole Union: "2030 climate target shall be a reduction of net greenhouse gas emissions (emissions after deduction of removals) by at least 55% compared to 1990 levels by 2030".

EU Sustainable Finance and real estate investments

Sustainable finance[4] is a work stream to support the European Green Deal channelling private investment to the transition to a climate-neutral economy. The European Commission set up a Technical expert group on sustainable finance (TEG) to assist it in developing:

- an EU classification system – the so-called EU taxonomy – to determine whether an economic activity is environmentally sustainable;
- an EU Green Bond Standard;
- methodologies for EU climate benchmarks and disclosures for benchmarks; and
- guidance to improve corporate disclosure of climate-related information.

The EU taxonomy is meant to help investors understand whether an economic activity is environmentally sustainable, and to navigate the transition to a low-carbon economy, setting a common language between investors, issuers, project promoters and policy makers.

The EU Taxonomy is vital in making the EU climate targets implementable in practice. It is a classification system that enables categorization of economic activities/sectors that play key roles in climate change mitigation and adaptation. To be eligible as sustainable an economic activity must contribute substantially to at least one of six environmental objective, and do "no significant harm" to the other five environmental objectives set out in the legislation. The classification works through technical screening criteria, methodology and guidance described in the Final report on taxonomy prepared by the Technical Expert Group on Sustainable Finance (EU TEG) and published in March 2020[5].

[3] https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-european-climate-law
[4] https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance_en#implementing
[5] https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en

For the real estate sector, the Taxonomy enables new real estates built in 2021 and forward to be considered as eligible for sustainable investments. For existing buildings, the Taxonomy demand buildings to have an minimum energy performance classification in order to be classified as sustainable.

The key element of the regulation in defining sustainability is “improving energy efficiency”. For the real estate sector the Directive (EU) 2018/844 on the energy performance of buildings will be the guiding documentation in defining energy efficiency.

Designing and renovating buildings to high energy performance standards is not sufficient to ensure low carbon emissions during operations, thus more needs to be done to address the ‘performance gap’ [6]of efficient buildings. Within this context, the TEG acknowledged the need for an ambitious approach and the crucial role that the taxonomy can play in directing financial flows towards the decarbonisation of the built environment.

On the EU level climate and energy targets by 2030 are:

- At least 55% cuts in net greenhouse gas emissions
- At least 32 % renewables in energy consumption
- At least 32,5 % energy efficiency

However, environmental NGOs have indicated that they remain sceptical that proposed measures in EU and national level will lead to actual emission reductions in line with targets set out in the Paris Agreement.

Changes and targets in the Finnish carbon neutrality goals, Sanna Marin’s government program

Finland has reduced its emissions to more than 21 per cent below the 1990s level and it has reached the EU’s climate targets for 2020 ahead of schedule. However, the 1.5 degree target also means tightening Finland’s emissions reduction requirements.

The Government of Finland has set following objectives that relates to construction industry and real estates and housing[7]:

- Finland will achieve carbon neutrality by 2035
- Finland aims to be the world’s first fossil-free welfare society
- We will strengthen carbon sinks and stocks in the short and long term
- Reducing the carbon footprint of construction and housing
- We will strengthen Finland’s role as a leader in the circular economy

[6] Carbon Trust “CTG 047 Closing the-gap, Lessons learned on realising the potential of low carbon building design”
[7] https://valtioneuvosto.fi/en/marin/government-programme/carbon-neutral-finland-that-protects-biodiversity

The Government of Finland will work to ensure that Finland is carbon neutral by 2035 and carbon negative soon after that. This will be done by accelerating emissions reduction measures and strengthening carbon sinks.

Electricity and heat production in Finland must be made nearly emissions-free by the end of the 2030s while also taking into account the perspectives of security of supply.

With minor exceptions, Finland will phase out the use of coal for energy by 2029 and the use of fossil fuel oil in heating by the start of the 2030s. Utilizing peat for energy production will be reduced at least with 50% by 2030.

The Government will increase fossil fuel taxes to collect. The electricity tax of heat pumps connected to district heating network will be transferred lower electricity tax class and the tax of this class will be reduced close to EU minimum. In the first phase, the following changes to the taxation scheme are planned:

- Emissions guidance in energy production will be increased by abolishing the industrial energy tax rebate system and reducing category II electricity tax towards the minimum rate allowed by the European Union. The overhaul will be carried out with cost neutrality over a transition period. Heat pumps and data centres generating heat for district heating networks will be transferred to category II electricity tax.
- Property tax relief for offshore wind power plants.
- Remove of the double taxation on electricity storage for pumped storage facilities and smaller batteries.

More than a third of the greenhouse gas emissions generated in Finland are caused by construction and buildings, while around a fifth come from transport. Finland must reduce these emissions in order to achieve its national and international climate objectives.

The Land Use and Building Act will be reformed[8]. The main objectives of the reform are to create a carbon neutral society, strengthen biodiversity, improve the quality of construction and advance digitalisation. The mitigation of climate change will be taken into account in land use planning, construction and the maintenance of the building stock.

[8] https://mrluudistus.fi/

3 Energy efficiency and climate performance actions in Finnish building stock

Emission reductions are mainly achieved by improved heating energy efficiency (or consumption habit changes) in residential buildings, purchasing cleaner electricity and utilizing cleaner heating sources

Energy efficiency and climate related actions of institutional investors are reviewed based on data obtained from KTI Property Information Ltd. The changes in CO_2 emission and energy consumption intensities during the years 2017-2019 are shown in the Figures 1 and 2. The factors effecting these changes that are not related with energy efficiency or other climate performance actions in building stock are weather and changes in the real estate portfolio owned by an investor during the time period. Natural changes in the portfolio occur due to purchases, selling and demolitions.

Heating demand has slightly decreased during the years 2017-2019. The data obtained from Finnish Meteorological Institute shows that heating degree days have decreased by 3,7 % in Helsinki and by 3 % in Tampere resulting slightly lower heating consumption in the real estate portfolios during the period. The changes in cooling demand is not analyzed since its importance in the total electricity consumption is not assumed to be significant. The effect of changes in real estate portfolios cannot be analyzed with the available data.

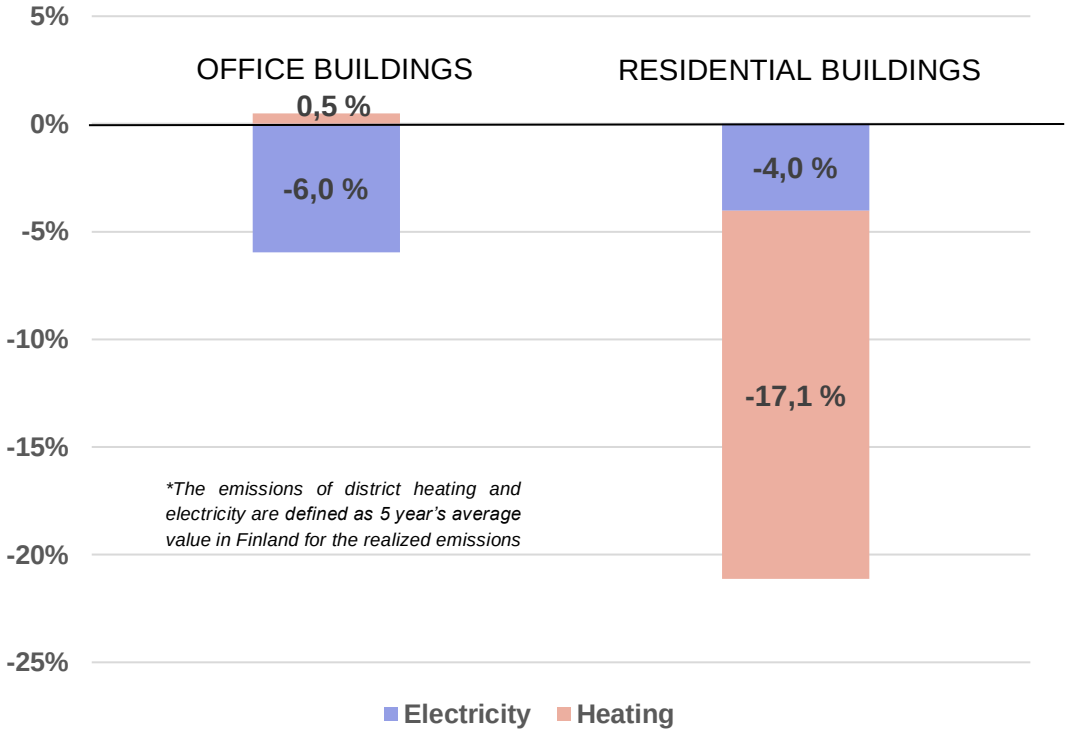

Figure 1. Changes in CO_2 emission intensities of building stocks of institutional investors during years 2017-2019.* [9]

The CO_2 emission intensities of institutional investors have declined by 5 % in office building stock and by 21 % in residential building stock during the years 2017-2019. At the same time, the intensity of energy consumption has increased by 8 % in office buildings and declined by 10 % in residential buildings. The emission reductions are mainly achieved by improved heating energy efficiency (or changes in the consumption habits) in residential buildings, purchasing cleaner electricity and utilizing cleaner heating sources. This analysis is conducted by further segmenting of CO_2 emission and energy consumption intensities separately for heating and electricity. The development of emission factors for district heating and electricity is not taken into account in the initial data and they don't affect the realized changes.

The intensity of electricity consumption has increased by 4,1 % in office building stock and decreased by 0,4 % in residential buildings. Thus, energy efficiency nor on-site electricity generation has had significant effect on the total CO_2 emission of the whole building mass. The CO_2 emission reductions of electricity are achieved by purchasing cleaner energy.

The intensity of heating consumption in residential buildings has decreased by 10 %. This can't be explained by the changes in heating degree days alone. The energy efficiency actions (or consumption habit changes) of residential buildings have therefore had significant positive effect on the changes in total CO_2 emissions. In office buildings, the intensity of heating consumption has increased by 3,6 % while the heating emissions have increased

[9] Source: KTI Corporate responsibility analysis 2020

only by 0,5 %. This suggests that changes towards cleaner heating sources have been implemented.

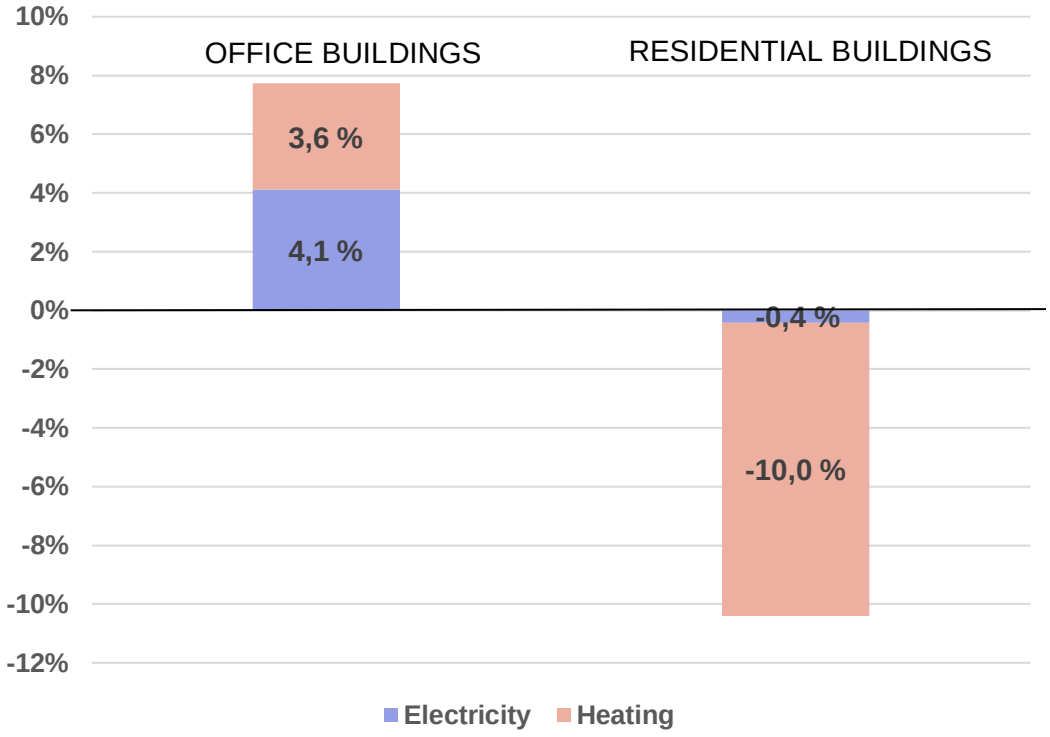

Figure 2. Changes in intensity of energy consumptions regarding building stocks owned by institutional investors during years 2017-2019 [10]

Generally, the available data indicates that emission reductions are mainly achieved by improved heating energy efficiency (or consumption habit changes) in residential buildings, purchasing cleaner electricity and utilizing cleaner heating sources. Consumption habit changes can't be excluded being a part of reduced energy consumption in residential buildings.

Breakdown of actions and the best practices

The study focuses on the six biggest institutional investors in Finland. The energy emission reductions and action taken regarding direct real estate investments are obtained from the annual and sustainability reports. Generally, the investors have focus on their real estate energy consumption that they are responsible of and that could be measured. Consumptions under tenant's energy contracts are excluded. However, 27 % of the investors responded to cooperate with their tenants to actively improve their energy efficiency also[11]. The achieved

[10] Source: KTI Corporate responsibility analysis 2020
[11] Source: KTI Responsibility barometer 2020

CO2 emission reductions during the years 2017-2019 by institutional investors are summarized in the Table 1.

Generally, the overall trends for CO_2 emissions are downward. The highest CO_2 emission reductions achieved are -36 % and -29 %. The lowest emission reductions achieved varies between few percentage to nearly zero. Thus, the measure of actions varies significantly among the investors during these years.

High volatility between the achieved reductions among the investors is caused by differences in the initial states of energy efficiency, green energy purchasing and changes in the real estate portfolios. For example, real estate manager of OP Real Estate Asset Management informed that the biggest energy efficiency potential with building control system adjustments have already been achieved in their building stock and significant energy efficiency improvements requires notable investments from now on.[12] Because of these factors, short-term comparisons shouldn't be used to point out development of a single institutional investors but to discover best practices.

Table 1. CO2 emission intensity trends of direct real estate investments by institutional investors during years 2017-2019 for energy consumption.

	Real estate CO_2 emission intensity trends of energy consumption, 2017-2019
Ilmarinen	**-28,1 %**
OP Kiiteistösijoitus	**~0 %*** *Estimated from a graph
Keva	Not reported for direct real estate investments
Varma	**-11,5 %**
LähiTapiola	**-1,1 %**
Elo	**-36,1 %**

Comparison of energy efficiency actions is more challenging than emissions due to differences in reporting methodology. The main differences are related to whether the reported energy consumption values are absolute values or intensities and weather adjusted or not. The comparison of energy efficiency development is not a straight forward task that could be performed with the information announced in annual reports.

The best practices implemented by institutional investors that have achieved the highest CO_2 emission during the years 2017-2019 are presented below:

- Elo[13]:
    - Transition to green electricity
    - Solar power plant acquisition

[12] Source: OP Real Estate Asset Management, 13.1.2021, Interview of Matti Puromäki, real estate manager
[13] Source: Elo, Annual and responsibility report 2019

  - Implementation of Virtual Power Plant concept in a shopping center
  - Modernization of residential building control systems
  - Renewing energy monitoring system

- Varma[14]:
  - Energy efficiency measures including waste heat recovery of data center and transition to LED lighting
  - Utilizing solar power and heat pumps in residential buildings
  - BREEAM certification requirement's for the most significant buildings
- Ilmarinen:[15]
  - Utilization of LEED certification for building stock. LEED Gold level required for all of the new properties developed.
  - A thousand different measures in their residential and commercial properties including automation system renewals, construction of heat recovery, transition to district cooling, conversion of indoor and outdoor luminaires to LED luminaires and replacement of ventilation fans. In addition added sensor technology, radiator valve replacements and network adjustments in residential buildings.

[14] Source: Varma, Annual and sustainability report 2019
[15] Source: Ilmarinen, 14.1.2021, Interview of Niina Nurminen, head of real estate development

4 Energy efficiency and climate performance targets in Finnish building stock

The key climate related quantitative targets of the six biggest institutional investors are presented in the Table 2. The targets are divided to energy efficiency, CO_2 emissions and local renewable energy production targets. The CO_2 emissions discussed consists of energy consumption of real estate that the investors are responsible of and that could be measured i.e emissions under scopes 1 and 2. All the investors reviewed have committed to Finnish energy efficiency agreement for property sector. The Agreements will be valid from 1 January 2017 until 31 December 2025[16]. Four of the investors have set 100 % carbon neutrality targets for energy consumption by the year 2030 and one of the investors has set carbon neutrality target for the investment of all pension assets by the end of 2035. One of the biggest investors hasn't defined its future emissions precisely yet. However, it is committed to Paris Agreement in their investment portfolio.

Several of the future carbon neutrality targets set for the year 2030 are supported with near future targets during the next five years. Carbon road maps are utilized as tools towards these targets in many of the cases. For example, OP Real Estate Asset Management and Ilmarinen are currently working on these roadmaps[17] [18]. Varma has published a target path based on Science Based Targets on CO_2 emissions (SBTi explained in Section 5). Current renewable energy production and its future is discussed in many interviews and annual reports. However, quantitative targets are set only by one institutional investor among the six biggest. The announced target is to increase local renewable energy production by 10 % by the year 2030 with solutions such as heat pumps and solar panels. Several investors have internal targets for renewable energy production among other energy targets.

[16] Source: "The Agreement and Action Plans". Web page of Energy Efficiency Agreements < https://energiatehokkuussopimukset2017-2025.fi/en/agreements/#the-agreements-and-action-plans >.25.1.2021
[17] Source: OP Reals Estate Asset Management, 13.1.2021, Interview of Matti Puromäki, real estate manager
[18] Source: Ilmarinen, 14.1.2021, Interview of Niina Nurminen, head of real estate development

Table 2. The key quantitative climate related targets of institutional investors[19]

	Finnish Energy Efficiency Agreement for the property sector	Real estate CO_2 emissions of energy consumption* Generally institutional investors inspect the energy consumption of real estate that they are responsible of and that could be measured. Tenant's energy contracts are excluded.			Local renewable energy production
	-2025	2020-2025	2025	2030	
Ilmarinen	✓	**-10 %** by 2020 (2015 level)	**-20 %** (2015 level)	Carbon neutrality in the investment of pension assets by the end of 2035	
OP Kiiteistösijoitus	✓			**-100 %**	
Keva	✓	**-100 %,** new built buildings since 2020	**-50 %** (2020 level)	**-100 %**	**+10 %,** by 2030 (2020 level)
Varma	✓	**-50 %** residential buildings by 2023	**-100 %,** electricity emissions	**-100 %**	
LähiTapiola	✓			**-100 %**	
Elo	✓		Committed to Paris Agreement in investment portfolio		

*Note: -100 % represents carbon neutrality target of energy emissions in scopes 1 and 2

[19] Source: The targets are obtained from the annual and sustainability reports, web pages and conducted interviews

5 Actions and targets compared with climate science

Generally, the realized CO_2 emission intensities of institutional investors represents a narrow time window compared to the time horizon where the targets are set. The direction and pace of the achieved emission reductions during years 2017-2019 are quite roughly discussed and estimated in this section. Because of this, the analysis should be dealt with reservation. Sufficiency of actions and targets to reduce emissions are analyzed with the guidance of the Science Based Targets initiative (SBTi) and CRREM (Carbon Risk Real Estate Monitor) described below.

The Science Based Targets initiative (SBTi) drives ambitious climate action in the private sector by enabling companies to set science-based emissions reduction targets. The SBTi is a partnership created between CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). World governments committed to global temperature rise to well-below 2 ˚C above pre-industrial level and pursuing efforts limiting warming to 1,5 ºC through Paris Agreement in the year 2015. The target of SBTi is to show companies how much and how quickly their businesses need to reduce greenhouse gas emissions to prevent the worst impacts of climate change by guiding companies in science-based target setting. This way, they lead companies to the path of decarbonization.[20]

CRREM (Carbon Risk Real Estate Monitor) is EU-funded research project aiming to reduce carbon risk factors associated with premature obsolescence and potential depreciation due to changing market expectations and legal regulations decarbonization. Its framework is focusing on carbon risk exposure and potential strategies to reduce this risk, and include the elements needed to undertake scenario analysis. It can be used to comply with initiatives such as the Task Force on Climate-related Financial Disclosures (TCFD) and the EU Taxonomy for sustainable activities. The project is part of the EU:s intends to decarbonize the building sector by 2050. The CRREM research consortium consists of five institutions, from various European countries: IIÖ Institute for Real Estate Economics (Austria), University of Alicante (Spain), Ulster University (UK), GRESB (Netherlands) and Tilburg University's TIAS Business School (Netherlands).[21]

Utilizing target setting with the guidance of SBTi is becoming a common practice that could be used among property owners in the future. The actions of institutional investors are compared with the data available for SBTi's guidance for financial institutions. While executing these comparisons, it is essential to realize that SBTi's targets are developed for global perspective. The key factors effecting green house gas intensities that considerably differ from the global level are climate conditions and the current share of renewables in

[20] Source: "About Us". Web page of Science Based Targets initiative < https://sciencebasedtargets.org/about-us >. 25.1.2021
[21] Source: "About CRREM". Web page of CRREM < https://www.crrem.eu/about-crrem/ >25.1.2021

energy production in the Finnish real estate sector. However, the pace and direction of emission reductions could be roughly compared with SBTi targets which forms an excelllent framework, even though the absolute GHG intensity values might differ.

The comparison of institutional investors' CO_2 emission intensities with SBTi's emission pathways for service buildings and residential buildings in beyond 2 °C scenario is shown in the Figure 3. The starting level of realized CO_2 emission intensity in office buildings is considerably lower compared with global intensity value. This is assumed to be caused by relatively high share of renewables in electricity production, possibilities for green electricity purchases and lower cooling energy needs compared with global averages. The trend itself is more gradual than SBTi's guidance trend but roughly in a line with an average yearly reduction needed for reaching nearly zero carbon targets until 2050.

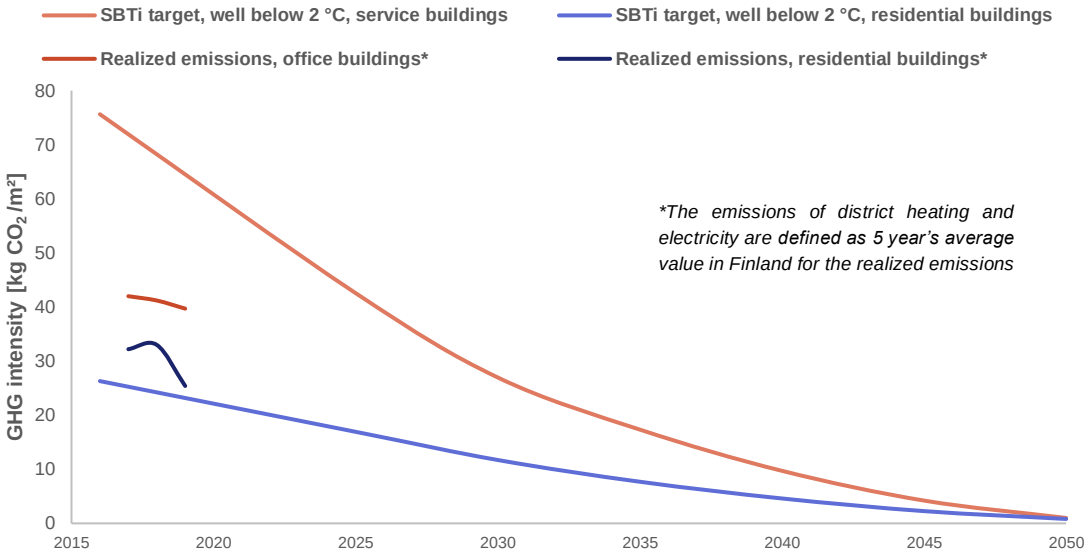

Figure 3. Realized emissions of institutional investors compared with global SBTi targets for service and residential buildings in beyond 2 ºC scenario. [22] [23]

The starting level of realized CO_2 emission intensity in residential buildings is higher compared to global average. This is assumed to be cause of high heating demand that dominates the overall energy consumption. The trend of emission reduction is steeper compared to SBTi's global target which is excellent now that the starting level is higher than global average. However, there is notable volatility in the emission intensity that might be explained with chances in the portfolio of owned residential buildings. This also illustrates the uncertainties related to analysis with a short time period.

The risk assessment tool created by CRREM provides science-based carbon pathways at property, portfolio and company level. The tool provides possibilities to identify carbon

[22] Source: Science Based Targets. "Financial Sector Science-Based Targets Guidance, Pilot version". 2020. https://sciencebasedtargets.org/resources/legacy/2020/10/Financial-Sector-Science-Based-Targets-Guidance-Pilot-Version.pdf

[23] Source: KTI Corporate responsibility analysis 2020

pathways for selected country, building type and global warming target (1,5 ºC/ º2 C).[24] The CRREM tool is used to analyze carbon pathways targeted in Finnish conditions. The tool provides data for office buildings but lack residential buildings. Thus, the review is performed for office buildings only.

The comparison of institutional investors' CO_2 emission and energy intensities with CRREM pathways for office buildings in 1,5 °C targets are shown in the Figure 4. The starting level of realized CO_2 emission intensity in office buildings is in line with the target level. The trend of emission reductions can be observed to be in a line with CRREM defined target levels. The energy efficiency of the building mass has turned worse implicating possible changes in a portfolio of office building ownership. Again, the volatility of changes in the reviewed building mass has a notable impact on results. Longer lasting time period for review would be relevant in this case also.

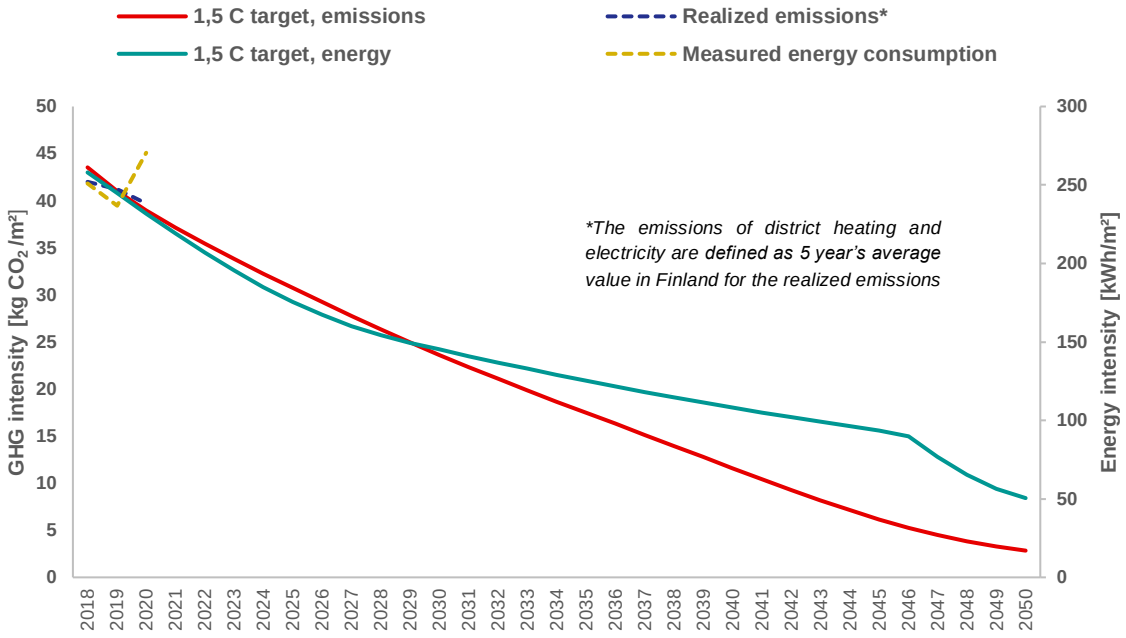

Figure 4. Realized emissions and energy consumption of institutional investors compared with CRREM targets for office buildings in 1,5 ºC scenario.[25]

The target settings of the six biggest institutional investors are summarized in the Table 2 in the section 4, "Energy efficiency and climate performance targets". The main focus of institutional investor's targets is zero energy emission by the year 2030. Both targets set by SBTi and CRREM aims at nearly zero emissions by the year 2050. The majority of the targets for scope 1 and 2 set by institutional investors are more ambitious compared with these targets, and are highly encouraged to keep. Nonetheless, the pace should be accelerated to reach these ambitious targets.

[24] Source: CRREM. "Carbon Risk Real Estate Monitor". 2020. https://www.crrem.eu/wp-content/uploads/2020/09/CRREM-Risk-Assessment-Reference-Guide-2020-09-21.pdf
[25] Source: "Tool". Web page of CRREM < https://www.crrem.eu/tool/ >25.1.2021

6 Conclusions and future recommendations

The review is based on time window of three years (2017-2019) which is very short term compared with the long term time horizon of climate targets. Strong conclusions can't be carried out at an early stage. In addition, short term inspections are influenced by weather and changes in real estate portfolios. Thus, the direction and pace of the achieved emission reductions are quite roughly evaluated. The analysis is based on given data which is not further validated by Gaia. Due to these factors, the analysis should be dealt with reservation.

Generally, the actions of the six biggest institutional investors reviewed are to a limited degree in accordance with science based target path (scope 1 and 2), although none of them have joined a commitment such as the Science-based Targets initiative. They are all committed to Finnish energy efficiency agreement for property sector until 2025 and given indications of their purposes towards zero energy emissions. Majority of the companies have reported quantified targets.

Four of the biggest institutional investors have set zero energy emission targets (scope 1 and 2) by the year 2030. The targets and carbon roadmaps are designed for scenarios of reaching nearly zero emissions by the year 2050. Finnish Energy Industry estimates that CO_2 emissions of electricity production is around 14 kg/MWh and district heating around 38 kg/MWh by the year 2035 in the base scenario[26]. The announced 2030 emission targets have a level of ambition and require green energy purchasing or strong investments in renewable energy production. These targets are highly encouraged to keep, but the current pace should be accelerated to reach these ambitious targets and the efforts additional to purchasing "green energy" (such as investments in energy efficiency) should also be emphasized.

Realization of the Finnish Energy Industry roadmap targets is essential for real estate owners and assists institutional invests to reach their targets for the most part. However, it doesn't mean that the investor's should be inactive reducing carbon emission intensities of their building stock. The key factors influencing emission intensities of institutional investors' real estate portfolios could be divided to external factors that the investors cannot directly affect on, direct factors that the investors can affect on and indirect factors that the investors can influence on. The external factors of the future emissions:

- Development of emission factors in electricity and district heating
- Changes due to global warming

The investors are highly dependent on the development of emission factors of produced energy. Carbon free electricity could be purchased anywhere in Finland but in most of the cases, heating is highly dependent on the development of district heating producers and their

[26] Source: AFRY. "Finnish Energy – Low carbon roadmap". 2020. https://energia.fi/files/5064/Taustaraportti_-_Finnish_Energy_Low_carbon_roadmap.pdf

climate related actions and targets. The investors can, as a customer, demand cleaner local heating by expressing their strong interests for such products and by open discourse. The green revolution of district heating production has a key role enabling the announced targets.

Operating environment in building sector is changing because of the global warming. In energy consumption point of view, it means decreasing heating demand and increasing cooling demand. This partly decreases the overall emissions of energy consumption in Finnish environment in a long term.

Direct factors of the future emissions:

- Energy efficiency and consumption habits
- Investments in renewable energy production
- Purchasing of green energy

Institutional investors are recommended to continue with their introduced actions related to energy efficiency improvements, investments in renewable energy and purchasing green energy. Getting on and staying on the science based target path is continuous work and improvements should be implemented and tracked purposefully every year. The journey is long and merely the first steps have been taken. Although the overall evolution of CO_2 emission is highly dependent on the energy producers, the investors are not recommended to be inactive since the targets requires actions in both demand and production sides. In cases of slow decarbonization of energy production, the investors can invest in energy production solutions of their own. Investments in solar production, wind farms and heat pump solutions are presented in many annual and responsibility reports of the investors. The investments raise demand for clean tech solutions and promotes the development of the market. This way, they can boost green energy production and the development of emission factors in energy production.

Indirect factors of the future factors:

- Changes in real estate portfolio
- Ownership duration of property

Selling, buying or demolishing energy inefficient buildings highly affects on the emissions of real estate portfolio in short-term. In the long term, energy inefficient buildings should be renovated to become energy efficient due to climate related targets. Short-term review of a single investor might be misleading because of this. However, long-term ownership strategies enable greater energy investments while short-term ownership doesn't serve long term climate targets. Institutional investors can indirectly affect on their CO_2 emission development by choices related to duration of property ownership. Nonetheless, assuming that carbon neutrality will effect on the value of properties in the future, it will further drive investors towards the climate targets they have set. This could even out the affect of different ownership duration related barriers in the future.

Development motivated by regulation

The “Bridge that gap” – report (2018)[27] recommends that the real estate market actors should develop climate policy and disclosure in accordance with Task Force on Climate related Financial Disclosures (TCFD) recommendations. This TCFD recommendation is still valid, but in addition the real estate market actors should take into account the EU Taxonomy on Sustainable Finance and requirements and the process required to demonstrate eligibility with the taxonomy criteria on green investments.[28]

The taxonomy will stimulate investments in the renovation of buildings with lower levels of energy performance, as the well as construction of new energy-efficient buildings and the efficient operation of existing buildings. Market actors who do not upgrade their practices in accordance with the taxonomy criteria may lose competitiveness and the ability to brand their economic activities and products as ‘green’. There is also a risk of creating stranded assets if the Taxonomy criteria are not fulfilled.

[27] https://wwf.fi/app/uploads/a/o/v/obz8734kl7d7jin15isjc4/bridge-that-gap.pdf
[28] https://ec.europa.eu/info/law/sustainable-finance-taxonomy-regulation-eu-2020-852_en

APPENDIX 1

Energy Performance in Buildings Directive (EPBD)

The building sector is crucial for achieving the EU's energy and environmental goals. At the same time, better and more energy efficient buildings improve the quality of citizens' life while bringing additional benefits to the economy and the society.

To boost energy performance of buildings, the EU has established a legislative framework that includes the Energy Performance of Buildings Directive 2010/31/EU (EPBD) and the Energy Efficiency Directive 2012/27/EU. Together, the directives promote policies that will help achieve a highly energy efficient and decarbonised building stock by 2050.

Both directives were amended, as part of the Clean energy for all Europeans package, in 2018 and 2019. In particular, the Directive amending the Energy Performance of Buildings Directive (2018/844/EU) introduces new elements and sends a strong political signal on the EU's commitment to modernise the buildings sector in light of technological improvements and increase building renovations.

The EPBD covers a broad range of policies and supportive measures that will help national EU governments boost energy performance of buildings and improve the existing building stock. For example

- EU countries must establish strong long-term renovation strategies, aiming at de-carbonising the national building stocks by 2050, with indicative milestones for 2030, 2040 and 2050. The strategies should contribute to achieving the national energy and climate plans (NECPs) energy efficiency targets
- EU countries must set cost-optimal minimum energy performance requirements for new buildings, for existing buildings undergoing major renovation, and for the replacement or retrofit of building elements like heating and cooling systems, roofs and walls
- all new buildings must be nearly zero-energy buildings (NZEB) from 31 December 2020. Since 31 December 2018, all new public buildings already need to be NZEB
- energy performance certificates must be issued when a building is sold or rented, and inspection schemes for heating and air conditioning systems must be established

The Commission has introduced a renovation wave of public and private buildings, as part of the European Green Deal. It aims to take further action and create the necessary conditions to scale up renovations and reap the significant saving potential of the building sector. This also includes new rules on smart readiness of buildings, which were published alongside the Renovation wave strategy in October 2020.

A refurbished and improved building stock in the EU will help pave the way for a decarbonised and clean energy system, as the building sector is one of the largest energy consumers in Europe and is responsible for more than one third of the EU's emissions. But only 1% of buildings undergo energy efficient renovation every year, so effective action is crucial to making Europe climate-neutral by 2050.

To pursue this ambition of energy gains and economic growth, the Commission published on 14 October 2020 a new strategy to boost renovation called "A Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives" (COM(2020)662). It aims to double annual energy renovation rates in the next ten years.

The Commission has also established a set of standards and accompanying technical reports to support the EPBD called the energy performance of buildings standards (EPB standards). These are managed by the European Committee for Standardisation (CEN).

The amended Energy Efficiency Directive

The amendment of the 2012 Energy Efficiency Directive (EDD) sets a new energy efficiency target for the EU for 2030 of at least 32.5%, with an upwards revision clause by 2023 and will extend the annual energy saving obligation beyond 2020, which will attract private investments and support the emergence of new market actors.

The EED also includes an extension to the energy savings obligation in end use, introduced in the 2012 directive. Under the amending directive, EU countries will have to achieve new energy savings of 0.8% each year of final energy consumption for the 2021-2030 period The EED will strengthen rules on individual metering and billing of thermal energy by giving consumers clearer rights to receive more frequent and more useful information on their energy consumption, enabling them to better understand and control their cost of heating.

The directive will require Member States to have in place transparent, publicly available national rules on the allocation of the cost of heating, cooling and hot water consumption in multi-apartment and multi-purpose buildings with collective systems for such services.

Renewable energy directive

The energy sector is responsible for more than 75% of the EU's greenhouse gas emissions. Increasing the share of renewable energy across the different sectors of the economy is therefore a key building block to achieving an integrated energy system that delivers on Europe's ambition of climate neutrality.

As Europe needed to increase the use of energy from renewable sources, the original Renewable Energy Directive (2009/28/EC, RED II) establishes an overall policy for the production and promotion of energy from renewable sources in the EU. In December 2018, the recast Renewable Energy Directive 2018/2001/EU entered into force.

The recast directive moves the legal framework to 2030 and sets a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023, and comprises measures for the different sectors to make it happen. The directive is a minimum harmonization directive which means that it sets a threshold which national legislation must meet. However, national law may exceed the terms of the legislation if desired

In summary the RED II directive:

- establishes a common framework for the promotion of energy from renewable sources.

- sets a binding Union target for the overall share of energy from renewable sources in the Union's gross final consumption of energy in 2030.
- lays down rules on financial support for electricity from renewable sources
- defines rules on self-consumption of renewable electricity and energy communities
- specifies on the use of energy from renewable sources in the transport sector
- specifies on the use of energy from renewable sources in the heating and cooling sector
- establishes sustainability and greenhouse gas emissions saving criteria for biofuels, bioliquids and biomass fuels
- lays down rules on regional cooperation between Member States, and between Member States and third countries, on guarantees of origin, on administrative procedures and on information and training.

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