

Ilmarinen Climate Roadmap

Approved by Ilmarinen's Responsible Investment Executive
Committee on 15 September 2021



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Ilmarinen Climate Roadmap

We invest in a sustainable future – Net zero carbon pension assets 2035

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Ilmarinen Climate Roadmap for Pension Asset Investments

Foreword

Climate change-related risks are changing the risk-return profile of individual companies and entire industries in all markets, leading to new and increasing risks in investors' portfolios. We expect that climate change will have a material impact on our investments both in terms of global transition to low-carbon economy and physical risks affecting investments in our portfolio.



The Paris Climate Agreement aims to limit the global temperature rise to well below 2 degrees Celsius and pursuit efforts to limit warming to 1.5 degrees¹. Average global temperatures have already increased by 1.2 degrees on pre-industrial levels, and according to the UN reports we are on a pathway closer to 3 degrees of atmospheric warming, with potentially severe impacts². Thus, it is an urgent and global challenge to meet the goals of the Agreement.

All stakeholders in the global economy are needed, and they need to act now so our economic and productive systems can be transformed to enable a sustainable future. We are a member of various international collaborative climate efforts aimed at advocacy on climate action by all market stakeholders. In addition to portfolio decarbonization and investing in low carbon solutions, we consider low carbon transition of global value chains crucial to enable real emission reductions. Goal-oriented engagement is an essential part of our approach and we are currently further developing targets and monitoring indicators for climate engagement.

Ilmarinen has been committed to the Goals of Paris Agreement since 2016 and had a climate roadmap spanning from 2016 to 2020. In December 2019 the Board of Directors of Ilmarinen set an ambitious target of a net zero portfolio by 2035. This roadmap describes our pathway to our goal for 2035.

Mikko Mursula, Deputy CEO, Investments

1 [Paris Agreement text English \(unfccc.int\)](https://unfccc.int/paris-agreement)

2 [Emissions Gap Report 2020 | UNEP - UN Environment Programme](https://www.unep.org/emissions-gap-report-2020)



Overview

Ilmarinen Mutual Pension Insurance Company is a responsible investor with a mandate to manage pension assets profitably and securely. Ilmarinen is Finland's largest private earnings-related pension insurance company. As a mutual pension insurance company, we are wholly owned by our customers. Integrating environmental, social and governance considerations into investment decision making is aligned with our mandate. In our view risks and opportunities posed by climate change are highly material to our investment activities.

Taking climate action both in considering climate risk and in seeking exposure to climate solutions are considered a commercially beneficial investment strategy for Ilmarinen. Our pension liabilities span decades and we are an investor with a long-term view. We consider that robust climate action by our investments is aligned with long-term shareholder value protection and generation.

This climate roadmap outlines how Ilmarinen is implementing our portfolio net zero target 2035 through interim targets, key actions and tracking of progress. We seek portfolio decarbonization and exposure to low carbon solutions. As a global investor, our portfolio is exposed to the entire economy and interconnected global value chains.

Only way to mitigate risks is to effect change in the real economy. Thus, we want to facilitate real-world emission reductions through investing also into transition of high emitting economic activities. This transition is necessary to enable the global economy to decarbonize.

Ilmarinen is committed to responsible investing and has been PRI signatory since 2006. We are committed global goals as expressed in the Paris Climate Agreement and the Sustainable Development Goals of the Agenda 2030.

Net Zero 2035

Ilmarinen has set a net zero target 2035. We aim to both decarbonize our portfolio and to invest in low carbon opportunities.

Our approach is built from the following key themes:

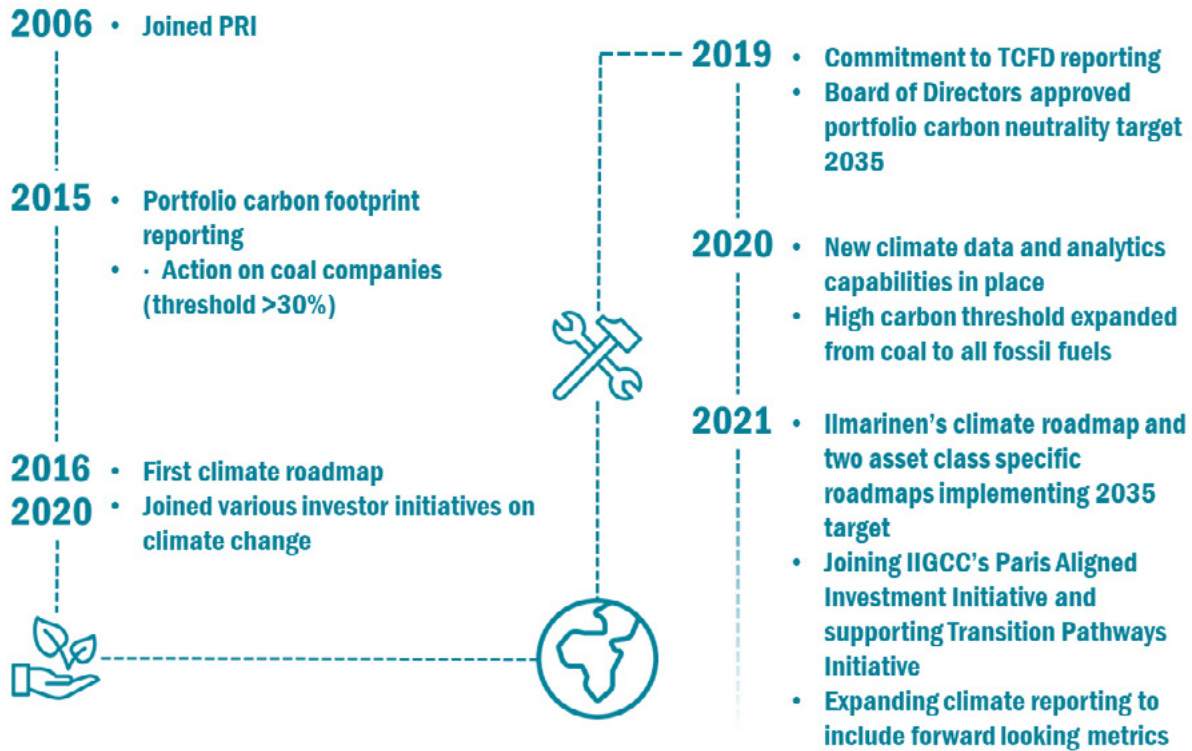
- Analysing and mitigating climate risks with the aim of portfolio decarbonization
- Investing in climate solutions
- Investing in companies in transition or with transition potential
- Engaging with high emitting companies to further climate transition
- Fostering collaboration, advocacy, partnerships and new climate solutions
- Targeting net zero portfolio 2035 with annual reporting on progress

This climate roadmap is part of Ilmarinen Environmental Policy established in the Responsible Investment Policy. Ilmarinen integrates responsible investment practices in all its investment activities. More information on our approaches in our Responsible Investment Guidelines.

Ilmarinen's Responsible Investment Policy and Responsible Investment Guidelines

The Board of Directors of Ilmarinen oversees the climate roadmap implementation. We report our progress annually through our Annual and Sustainability Report that includes Task Force on Climate-related Financial Disclosures (TCFD) reporting. Our climate roadmap is a living document that we assess, adjust and develop on continual basis as the climate science, international investor best practices and our learning evolve.

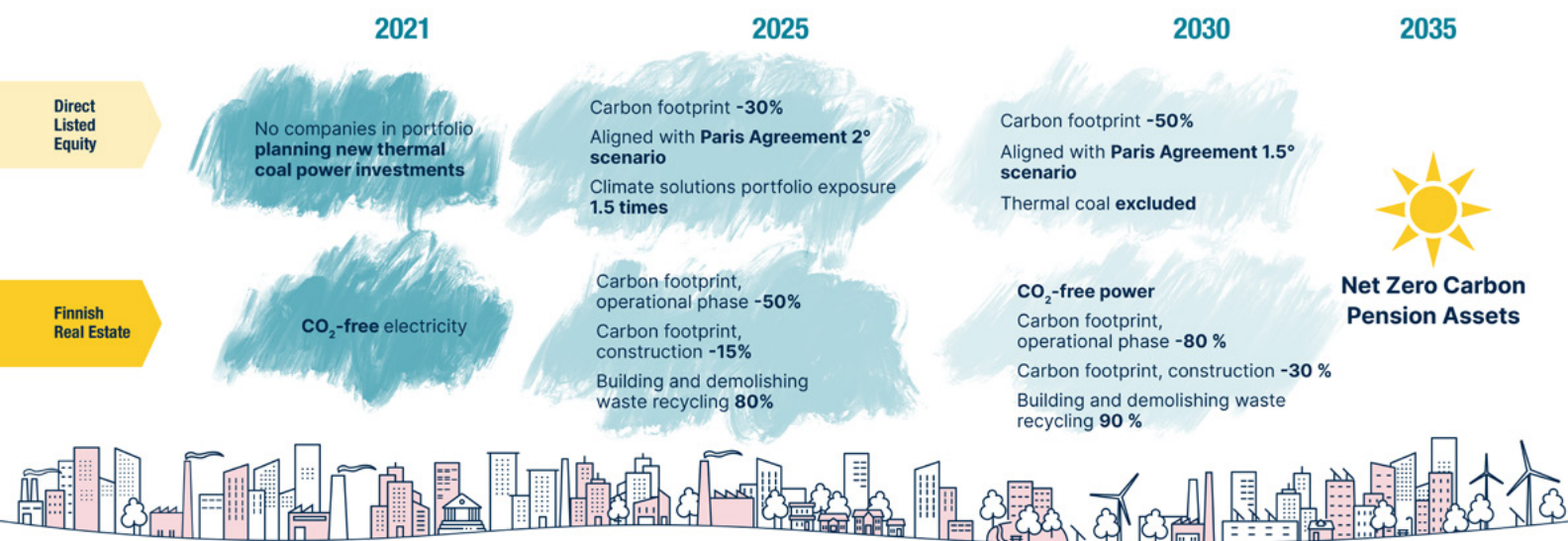
Ilmarinen's main climate actions from 2006 to 2021



• 2022-25

- * Establishing additional asset class specific roadmaps including interim targets with baselines, key action and performance indicators
- * Revising climate change engagement and voting policies
- * Integrating climate action to remuneration mechanisms at different levels of the organization
- * Assessing possibilities to integrate climate risk into long term return and solvency scenarios
- * Climate related internal training
- * Establishing further external asset manager requirements
- * Continuous development of the climate roadmap and its implementation through the asset class specific climate roadmaps, including establishment of baselines, targets, and monitoring indicators from 2025 to 2030 across climate roadmaps

We invest in a sustainable future – Net zero carbon pension assets 2035



CLIMATE ROADMAP 2021–2035

Principles for Responsible Investment 2006

Climate Roadmap 2016–2020

- Investments in sustainable development doubled
- The carbon footprint of real estate -14%

TCFD-reporting 2019

Joining IIGCC's Paris Aligned Investment Net Zero Asset Owner -alignment
Two asset specific roadmaps

Advocacy, collaboration, and engagement to support transition

Increasing internal knowledge about climate issues, integrating climate targets as part of remuneration

Integrating climate risk to long term return and solvency scenarios

Continuous development of climate roadmaps
New asset specific roadmaps

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Assumptions and principles

Investment environment and profitable and secure investments

To invest profitable and securely, Ilmarinen needs a diversified portfolio that is exposed to a high number of jurisdictions. Thus, strong government action in terms of regulation, carbon pricing, creation of enabling environment for transition and private sector innovation and consumer demand for climate solutions is required to enable market transition at scale and at an increasing rate.

Currently Ilmarinen can optimize both portfolio diversification needs and climate goals. An important part of the creation of an enabling environment, is to allow the establishment of investment products that are large and liquid enough. However, if in the coming years global climate action is weak, our investable universe could constrict, thus affecting our diversification and concentration of investments. Hindrances in the operating environment could include slow global decarbonization rates and slow evolution of the market of climate products.

To enable timely adjustment of our policies we monitor the potential climate scenarios and aim to adjust our approaches while meeting our fiduciary duty of as a private Finnish pension insurance company. If the global economy decarbonizes and transitions in an orderly fashion, less abrupt policy action on portfolio construction and strategic asset allocation is required.

Decarbonization and transition

While managing climate risk and gaining exposure to climate solutions we invest in companies in transition or with potential to take significant action on transition. In practice, this

means companies that are significant emitters today but have a pathway to transform their business to become compatible with a low carbon economy. In our view we have the potential to achieve more in terms of real emission reductions with engagement than with immediate divestment. We continuously aim to develop our transition data and methods and engagement approaches.

Our transition analysis will be developed further as a discrete item of our roadmap. Potential items in transition analysis include climate target setting in short, medium and long term that are aligned with Paris Climate Agreement and based on Science Based Targets; climate strategy and reporting including investment planning in alignment with the climate strategy and reporting on absolute and relative emissions evidencing the implementation. Also, governance aspects are relevant in transition analyses, including management remuneration schemes, and defined role and oversight of management and board of directors.

In management of climate risk divestment is ultimately one tool in our toolbox. This means reducing exposure to coal and fossil dependent companies that do not consider climate risk to their business. The divestment may result from internal policies that deem a company entailing too high and unmitigated climate risk and/or from unsuccessful climate themed engagement.

Data

Data is a key cornerstone of investor climate action. We need better data; therefore we need our investees to report in a clear and transparent manner, with increasing scopes, and to set robust climate targets. Accurate and reliable data is crucial for robust climate action and we expect our data and analytics providers to align with best industry practices and latest knowledge emerging from international scientific bodies. However, it should be noted that there is always some, and at times significant, lag in both methodological alignment and asset specific data.

Data and service providers are essential support for us. We collaborate, engage and advocate with several data and service providers to continuously have the best possible tools and solutions.

Scopes

Transparency in measurement and reporting is important. We aim to follow the best industry practice and apply the principles and recommendations by IIGCC and TCFD, for example.

In terms of scopes for target setting we follow the IIGCC Paris Aligned Investment Initiative Net Zero Investment Framework recommendations. As recommended by IIGCC PAIL we consider scopes 1 and 2 for listed equity. We acknowledge that decarbonization based solely on Scope 1 and Scope 2 GHG emission could lead to inaccurate conclusions of the carbon footprint of investment portfolios. However, the current quality and disclosure of Scope 3 GHG emissions is limited. In our view the scope 3 data will become more accurate with time. As data accuracy increases and we develop our approaches further, we aim to integrate scope 3 into the target setting. For real estate our focus in target setting is scope 2 (operating phase energy) and scope 3 (construction phase emissions).

In investment analysis and in monitoring and reporting on listed companies we have the capability to include scopes 1+2 and scope 3. We report as per TCFD recommendations and report scopes 1+2 and scope 3 upstream. The figures are reported with and without scope 3 considering the issues of double accounting and accuracy involving scope 3 data today. We also have the capability to report both on Kyoto gases and also include reporting on

other relevant greenhouse gases³ that have the potential to cause atmospheric warming. Transparency in both target setting scopes and reporting scopes is crucial as several items, including choice of scopes, can affect the results.

Role of offsetting

Offsetting should not be considered first choice in the toolbox for net zero portfolio. Considering the need to decarbonize, and in line with IIGCC Net Zero Investment Framework, we take precautionary approach to the use of external offsets as a significant long-term strategy for achievement of portfolio decarbonization target. We aim to apply the principle of mitigation hierarchy to avoid and reduce emissions where possible and reserve the possibility to use offsets in the future in cases where there is otherwise not technologically or financially viable solution. With today's technology and considering that we do not foresee entire exclusions of hard-to abate sectors, full carbon neutrality of all economic activity across portfolio is not likely. Research into foreseen need and best approaches on offsetting continues and we continue to monitor the development.

Key action

Risk management and scenario modelling

Climate change affects institutional investor portfolio via transition risks (e.g., energy efficiency programs, fuel subsidies, phaseout of coal), physical risks (extreme weather impacts e.g., flooding or wildfires and also chronic risks such as rain stress on real estate properties) and market risks (e.g., timing of climate risk pricing in and market reactions to shocks).

Climate change poses a significant and material risk for the global economy. Climate risk is systematic, i.e., it has the potential to affect investment portfolios across asset classes, sectors, and geographical regions. The financial impacts of climate change related risks can vary by timing, magnitude and direction. Ilmarinen has a highly diversified portfolio and a long-term horizon. Thus, understanding the potential impacts of climate change on our investments in especially the medium and long term is crucial. Ilmarinen utilizes both top-down and bottom-up modelling.

Climate risk analytical approaches

Top down: Assessment of climate impacts at macro-economic level – assets classes, sectors, geographic regions

Bottom-up: Assessment of climate impacts at company and security level

Ilmarinen aims to utilize both top-down and bottom-up modelling. In the top-down approach

³ CCl₃, C₂H₃Cl₃, CBrF₃, CO₂ from biomass

we estimate how various predefined climate change scenarios impacts the economy and capital markets. Top-down climate scenario analysis is a holistic approach helping to quantifying climate-related risks on Ilmarinen key metrics, such as portfolio returns and solvency ratio over various time horizons. This is crucial for any investor which is looking to ensure portfolio resilience and business continuity by considering climate change in investment decision making.

For listed securities the bottom-up approach allows quantifying historical and forward-looking climate related risks starting from a security level. Analysing historical data such as carbon footprint data of individual companies allows quantification of the greenhouse gas emissions (GHG) embedded within an investment portfolio. Carbon related data such as absolute GHG emissions can be normalized by a financial indicator (for example, revenues). This enables observation of carbon intensity information and comparisons between companies or investment portfolios. A number of other aspects (e.g., exposure to fossil fuels) can be assessed in order to understand exposure to holdings with business activities with stranded asset risk that could be realized in context of transition to low carbon economy. Forward looking assessments at the portfolio level include emissions trajectory assessments aligned to the 2- or 1.5-degree pathway. The bottom-up analytical approaches depend on asset class. For example, in our domestic direct real estate investments we estimate each property life cycle carbon footprint in the development phase.

Portfolio construction

Ilmarinen climate strategy is implemented through asset class specific roadmaps. In 2021 Ilmarinen has established two asset class specific roadmaps, namely the Finnish real estate roadmap and the direct listed equity roadmap. In the coming years, we will establish further roadmaps with interim targets, key actions, and monitoring indicators for other asset classes.

In our work throughout other asset classes, we build on our existing approaches. For example, we already have climate incorporated in our external manager due diligence process and annual surveys. Our high carbon intensity threshold approach applies both to direct listed equity and listed corporate bonds. Also, our equity ETFs that cover approximately one tenth of the portfolio already integrate ESG through underlying index methodology. In 2020 the methodology excluded all companies deriving 5% or more aggregate revenue from thermal coal mining and unconventional oil and gas extraction or thermal coal-based power generation.

In our directly managed portfolio, we aim to:

- Integrate ESG and climate into all investment decision making through phased approach across asset classes with the view to reduce emissions from our investments while meeting our requirements to invest profitable and securely.
- Analyse and mitigate climate risks and invest in climate solutions.
- While managing climate risk and gaining exposure to climate solutions we invest in companies in transition or with potential to take significant action on transition.
- Engage at company level to further climate transition of high emitting companies.

In our externally managed portfolio, we aim to:

- Favour asset managers who help us reaching our climate goal and, thus, are committed to climate action including alignment with the goals of the Paris Climate Agreement while meeting our requirements to invest profitable and securely.

- Annually monitor with our asset managers climate and ESG approaches and performance.
- Engage with the asset managers based on annual reports and our climate analytics.
- Expect our asset managers to increasingly report on climate performance and net zero commitments and action. Examples of metrics include carbon foot printing, forward looking climate metrics, and stewardship and advocacy activities.
- Encourage the asset managers to take part to industry collaborative efforts on engagement and advocacy of stakeholders in the financial system to promote net zero alignment.
- In 2021-25, develop our approaches further across asset classes, including different externally managed assets.

Engagement and stewardship

Engagement is an important part of driving real-world change and transition towards low carbon economy. Our engagement on climate includes various levels of the company from top management to thematic experts. In our view robust climate action comprises of transparent climate strategy including target setting, monitoring, and reporting and overall governance from the top management. In our view the following are part of such strategy, and we expect companies to work towards:

- Public commitment and target setting to greenhouse gas emissions reductions that are aligned with reduction pathways for limiting global temperatures rise to 1.5 degrees or well below 2 degrees compared to pre-industrial level temperatures. Target setting applying Science Based Target is recommended standard where possible.
- Measuring all relevant GHG emissions.
- Communicating and reporting at least annually on climate performance, preferably based on Task Force on Climate Related Financial Disclosures, increasingly including scope 3 emissions.
- Continuous development of company climate approaches, taking into account changes in the operating environment, evolution of climate science and best industry practice.
- Climate change is interconnected with other environmental and social issues. We also consider important that companies consider other environmental issues such as biodiversity and natural capital and aim for high overall ESG performance and comply with international norms.

We engage directly with companies by ourselves, with other investors such as Nordic Engagement Co-operation, and as part of broader group such as Climate Action 100+. Our engagement approach is holistic, i.e., engagement is carried out by number of Ilmarinen staff including portfolio managers, thematic specialists and management. We are also revising our stewardship policy on voting and aim to increasingly vote in AGMs with meaningful climate relevant topics.

We also engage in dialogue with data and analytics and index providers, rating agencies, consultants, and other stakeholders to continuously improve climate data and analytics. This advocacy is typically carried out via dialogues, consultations, and collaborations.

Advocacy and collaboration

No single stakeholder or industry can achieve the scale of transformation required in the global economy. Advocacy and collaboration are crucial parts of global investor climate action seeking global economy limiting emissions in alignment with the Paris Climate Agreement. Financial industry has an important role in global climate action but no single stakeholder or even an industry can alone create the scale of transformation of the global economy that is necessary. One element of our climate approach is the participation into

policy dialogue and campaigns aiming to advocate to climate action and net zero policy and regulation and enabling environment for low carbon solutions with policy makers, investment industry and other stakeholders.

We are members of organizations such as IIGCC Paris Aligned Investment Initiative, Transition Pathway Initiative and Climate Leadership Coalition. We have joined the IIGCC with the view to together with other institutional investors find most effective portfolio decarbonization methods. We participate in various working groups under the IIGCC and take part in advocacy efforts. We are also member of other climate relevant forums and industry associations such as PRI, Finsif, Finance Finland and Tela.

Monitoring, reporting and continuous improvement

We utilize both top down, portfolio level and bottom-up asset level climate analytics. We use climate data and analytics from several service providers and integrate these into our investment decision making, portfolio monitoring and risk management. We continuously work in collaboration of our data service providers to ensure continuous development and learning.

We expect that progress in attaining climate targets will not be linear by nature. In practice this means that at times our progress will exhibit leaps while at other times it is only incremental. Due to this we have set milestones for 2025 and 2030. To monitor our progress, we have established detailed performance indicators. Based on the principle of continuous learning and development we review our climate strategy and performance indicators periodically. We assess the effectiveness of measures we have put in place with the readiness for modifications where necessary.

Climate science, investor applications, including data and analytics, and our understanding continuously evolve. Our climate strategy and asset class specific roadmaps are living documents based on continuous learning. A number of global efforts are on-going, namely e.g. IIGCC, to establish investor best practices on climate. Currently these approaches do not yet cover all asset classes. We establish further asset class specific roadmaps in the period of 2022-25.

We report annually on our climate performance as part of our annual report including Climate Related Financial Disclosures (TCFD) reporting. We have carried out TCFD reporting since 2019 (for 2018 portfolio) and continue committed to the reporting framework.

Ilmarinen's Annual reports

Ilmarinen's PRI reports

In climate reporting number of choices affect the results. These include for example choice of methodology, scopes, which greenhouse gases are included (Kyoto or also other gases with atmospheric warming potential) or selection of sample, i.e., which assets are chosen for the calculation. There are various methods of calculating the carbon footprint of an investment portfolio. To increase transparency of reporting, Ilmarinen notes in its annual reporting, the choices made in collecting carbon footprint information. We report asset classes separately, when possible. This means for example reporting separately directly managed listed equity and externally managed listed equity climate performance.

Governance

The underlying asset class specific roadmaps and other actions are implemented by respective teams in the Investment Department. The Responsible Investment Executive Committee and, at the highest level, the Board of Directors of Ilmarinen oversee the climate roadmap implementation in alignment with our 2035 net zero goal. We report our progress annually. Our climate strategy is a living document that we assess, adjust and develop on continual basis as climate science, international investor' best practice and our learning evolve.



Listed equity climate roadmap

Foreword

Environment, social and governance (ESG) aspects are integrated into all our investments in Ilmarinen direct listed equity portfolio. Climate risk and related opportunities of low carbon economy are an important aspect of our ESG and responsible investment approaches. We as a pension insurance company have long term investment perspective. We believe that long-term shareholder value protection and generation is aligned with companies accounting for climate risks and grasping related opportunities.



Annika Ekman, Director, Listed Equity Investments

Introduction

Ilmarinen has board approved commitment of net zero portfolio 2035. To operationalize the climate goal Ilmarinen is establishing asset class specific roadmaps. Ilmarinen direct listed equity portfolio value is more than 20 % of our total pension assets under management and therefore plays an important role in our climate action. This roadmap describes our climate commitments, action we are taking and how we monitor and measure our climate progress through milestones and performance indicators on our direct listed equity portfolio.

Taking climate action both in considering climate risk and in seeking exposure to climate solutions are considered commercially beneficial investment strategy for Ilmarinen. Our pension liabilities span decades and we are an investor with long term view. We consider that robust climate strategy and action by our investees and long-term shareholder value protection and generation are aligned goals.

We aim to realize our climate goal through own action on portfolio construction and through collaboration, engagement, and advocacy. We are members of various global investors alliances and collaborative efforts, e.g., Institutional Investor’s Group for Climate Change which is a collaborative effort to find practical measures for net zero portfolios. Among other asset classes, listed equity approaches are included in the current IIGCC scope. Our approaches aim to be aligned with best international investor practice.

Our climate roadmap is a living document that we assess, adjust and develop on a continuous basis as the climate science, international investor best practices and our learning evolve.



Our approach is built from the following key themes

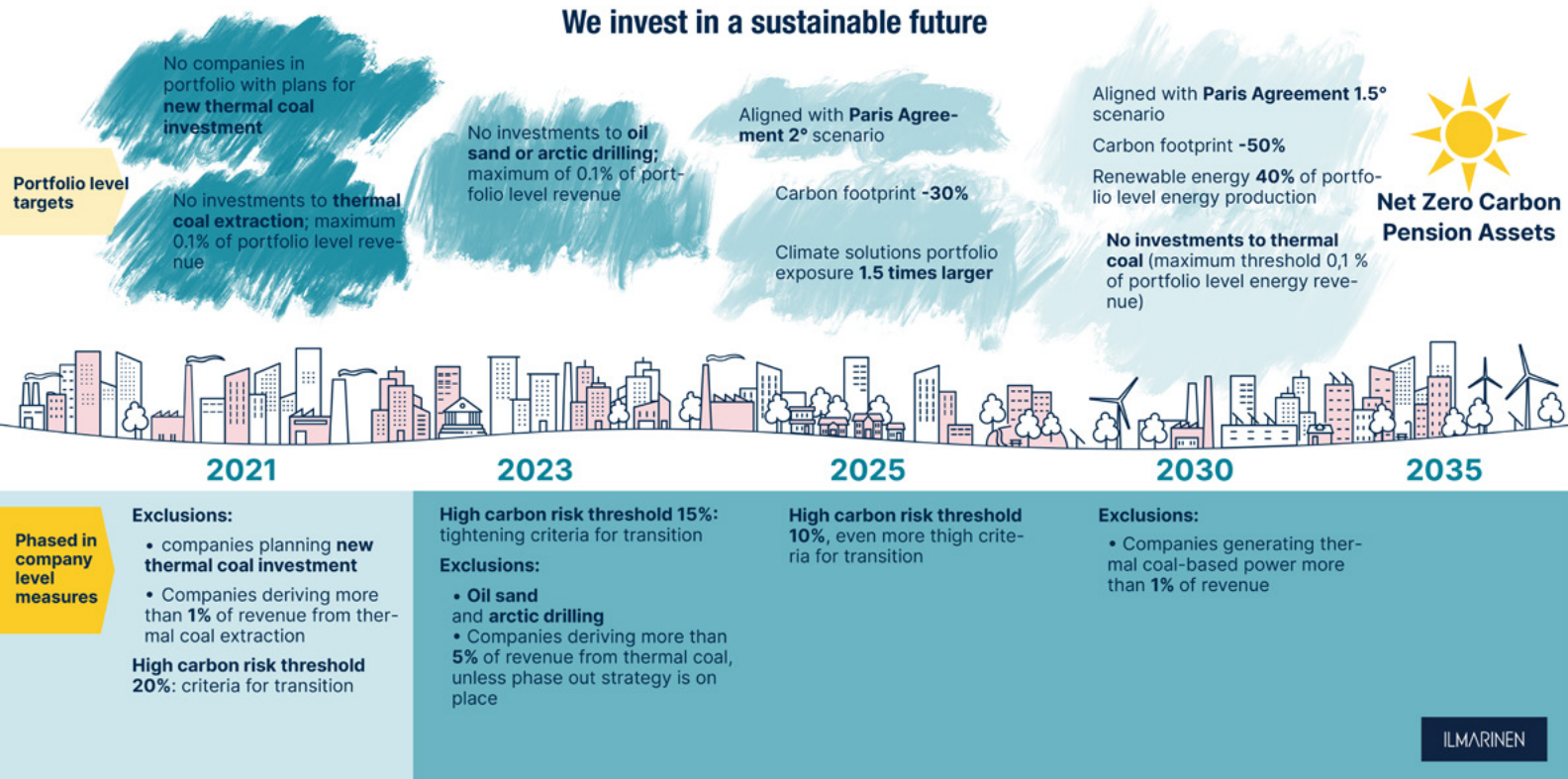
Portfolio construction: analysing and mitigating climate risk and exposure to climate solutions and companies in climate transition

Engagement and stewardship: engaging through various channels and active ownership integrating climate considerations

Advocacy and partnerships: memberships in various collective efforts in the financial industry working towards net zero portfolios and advocating climate action by all stakeholders

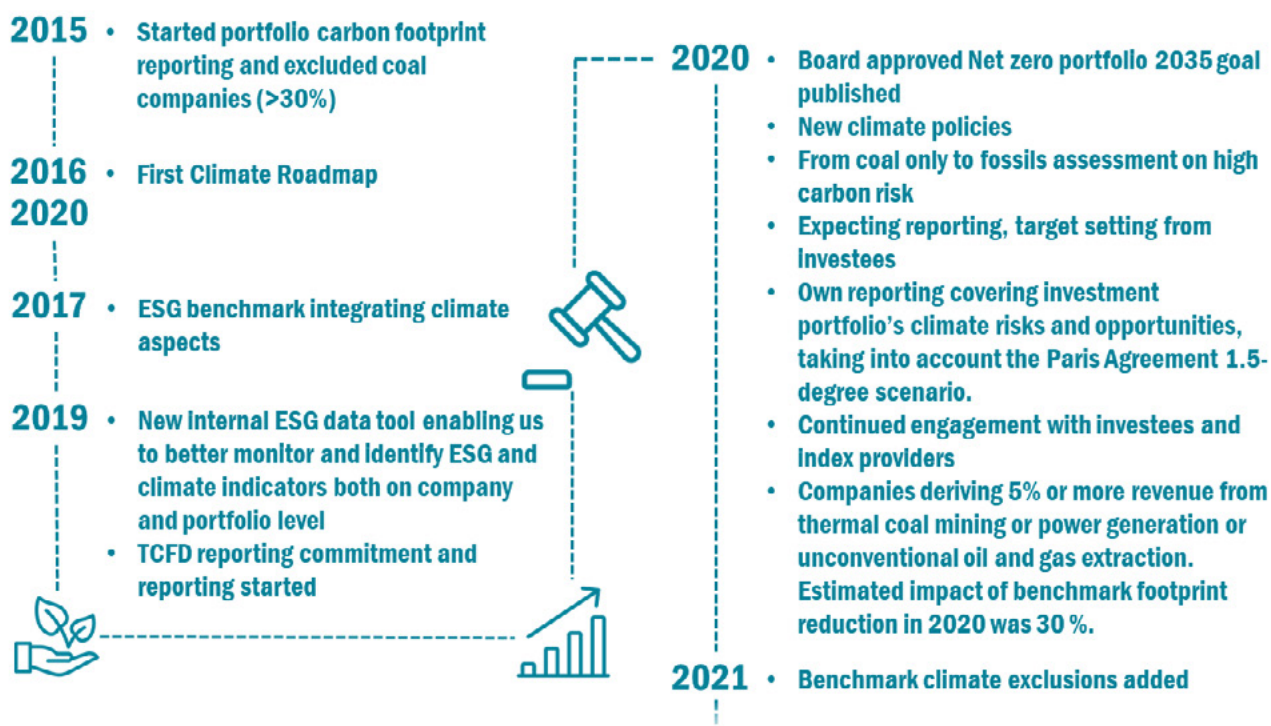
Portfolio level key targets for direct listed equity portfolio:

We invest in a sustainable future



Prior climate action on direct listed equity

The previous climate roadmap was established in 2016 and ended in 2020. The outcome of the roadmap was reported in the 2020 annual report, and we reached most of the goals. The portfolio carbon footprint (WACI) for direct listed equity declined⁴ and the SDG contribution was nearly doubled. The goal on full Paris alignment of selected hard-to abate sectors (fuel, utilities, road vehicles) was not met as the Paris alignment of the selected sectors varied between 30 and 67%.



Key direct listed equity climate action

Defining our investable universe and portfolio construction policies

- We apply ESG ratings and other climate data and target best performing companies. Climate is integrated into the ESG ratings.
- Climate policies
 - * We are aligned with IIGCC PAII and identify most material sectors from climate emissions perspective by applying revenue based high carbon risk screening⁵. The threshold will be gradually lowered between 2021 and 2025. For companies exceed-

⁴ The footprint reduction (WACI) was approximately 6% noting that our portfolio changed significantly due to a merger in 2018. The merger resulted in significant changes in the portfolio so that the baseline from prior to the merger is no longer comparable

⁵ We can only invest in a company exceeding our threshold of high carbon risk operations based on a more detailed assessment where we evaluate, among other things, company's emission reduction targets, intensity evolution and position in its peer group. We use the methodology and categories provided by MSCI. Further information can be found on our responsible investment guidelines [Responsible Investment Guidelines \(ilmarinen.fi\)](https://www.ilmarinen.fi/Responsible-Investment-Guidelines)

ing threshold we screen company climate targets and climate performance against peers and will tighten the criteria by 2025.

- We address coal and fossil fuels through specific policies and exclusions.
 - * Screening for companies planning new thermal coal investment with portfolio level exit by end of 2021
 - * Screening for thermal coal extraction revenue with portfolio level exit by end 2021⁶
 - * Screening for oil sands and arctic drilling-based revenue with portfolio level exit by end of 2023⁷
 - * Screening for thermal coal power generation revenue with portfolio level exit by 2030⁸
- We screen for norm violations, including environmental norms. Norm violators can be invested in and held only if engagement process is on-going or can be started and progresses.
- Benchmarks:
 - * We are applying since 2017 ESG index benchmarks that in 2020 integrated further climate consideration. From 2021 onwards we continue to work on climate benchmark development observing e.g. Paris Aligned Benchmark guidance by the EU and other market practice.
 - * Wide range of sectors are needed in global economy, thus we do not apply sector exclusions or strong sectors tilts that avoid the hard to abate sectors and, thus, create index level carbon footprint reduction through avoidance. Our approach emphasizes engagement for emission reductions in the hard to abate sectors.

In addition, we investigate and develop following themes and approaches in the coming years:

- Developing targets and indicators for engagement and transition,
- Benchmark index analysis,
- Analysis of feasibility to set a science-based target,
- Analysis on potential new exclusions on e.g. fossil expansion and unconventional fossil fuels and further thermal coal value chain activities,
- Assessing use cases on utilizing absolute emissions thresholds,
- Continue developing approaching on measuring climate solutions.

We integrate climate and ESG considerations into investment decision making

- ESG and climate integration:

We have data systems that enable ESG and climate data feed directly into the trading platform. We have company level backward and forward-looking analysis on carbon footprint, performance against peers and temperature pathway, including alignment with the Paris Climate Agreement and data on climate solutions including EU taxonomy or other frameworks. We continuously develop our data systems to integrate the most material data.

- Management or risk and exposure to opportunities:

We aim to both manage climate risk and gain exposure to low carbon solutions. Climate risk management includes guiding policies on investment selection at company level, such as intensity metrics, performance against peers, climate goals and temperature rating. Climate solutions requires exposure to companies generating revenues from products and services

6 Portfolio level revenue threshold 0.1%

7 Portfolio level threshold 0.1%

8 Portfolio level threshold 0.1%

that provide solutions for low carbon economy.

- Climate transition:

While managing climate risk and gaining exposure to climate solutions we invest in companies in transition or with potential to take significant action on transition. This means in practice companies that are significant emitters today but have a pathway to transform their business to become compatible with low carbon economy. In our current approach we analyse companies with high carbon intensity and tighten the intensity threshold stepwise to 10% by 2025. The high carbon intensity companies are analysed based on their climate performance against peers and their climate target setting. Transition analysis will be developed further and potential items in transition analysis include e.g. climate target setting in short, medium and long term that is aligned with Paris Climate Agreement and is based on Science Based Targets; climate strategy and reporting, including investment planning in alignment with the climate strategy and reporting on absolute and relative emissions evidencing the implementation. Also, governance aspects are relevant in transition analyses, including management remuneration schemes, defined role of management and board of directors.

- Divestment:

In management of climate risk divestment is one tool in our toolbox. This means reducing exposure to thermal coal and fossil dependent companies that do not consider climate risk to their business. The divestment may result from internal policies that deem company entailing too high and unmitigated climate risk and/or from unsuccessful climate themed engagement.

Ilmarinen as an institutional investor has highly diversified portfolio and invest in global value chains. For decarbonizing the global economy, high-emission sectors also need capital to enable low carbon transition. In practice, for example, windfarms require inputs from high emitting sectors (e.g. materials such as steel and concrete). Thus, we continue to invest into sectors where decarbonization is crucial yet challenging. Therefore, deeper analysis of technologies and policies help us to identify the best performers within these sectors.

Monitoring and reporting

We utilize both bottom-up, i.e. company level, and top-down, i.e. portfolio level analysis to monitor our portfolio. We have internal company and portfolio level climate and ESG specific analysis tool that enables different levels of analysis at portfolio level or e.g. at sub-portfolio or sector level. This analytics enables internal monitoring and periodic reviews against our targets. We use both backwards and forward-looking data in monitoring, including e.g. climate performance, target setting and Paris alignment.

We are committed to reporting as per Task Force for Climate Related Financial Disclosure (TCFD) principles. In climate reporting number of choices affect the results. These include for example choice of methodology, scopes, which greenhouse gases are included (Kyoto or also other gases with atmospheric warming potential) or selection of sample, i.e. which assets are chosen to the calculation. For carbon intensity there is also various methods to calculate the intensity. To increase transparency of reporting Ilmarinen notes in its reporting the choices made. We report assets classes separately, when possible. This means for example reporting separately directly managed listed equity and externally managed listed equity climate performance.

As monitoring indicators we use e.g. carbon footprint (WACI), power mix, thermal coal-based power revenue, thermal coal extraction revenue, oils sands and arctic drilling revenue, climate solutions revenue, portfolio level scenario modeling on Paris alignment.

Active ownership and stewardship

We engage with companies on various ESG themes, including climate action. Our portfolio managers frequently discuss with portfolio companies on climate matters: See our company climate action expectations below. We engage both through collaborative efforts, services providers and directly. We consider that company robust climate strategy and action and long-term shareholder value protection and generation are aligned rather than mutually exclusive. In 2021-22 we aim to further develop our engagement practices, including targets and monitoring indicators.

We identify potential climate laggards through climate analytics available, comparing company climate performance and sector and peer performance. We engage with climate laggards either through collaborative efforts, directly or through both channels.

We actively exercise our voting rights, including matters on company climate actions. In 2021-22 we aim to further detail our voting practices.

In Finland we participate in several nomination committees and through the nomination committees work in collaboration with other committee members to ensure sustainability and climate competence at board level.

We consider that company robust climate strategy and action and long-term shareholder value protection and generation are aligned

Investee climate action expectations

- Public commitment and target setting to greenhouse gas emissions reductions that are aligned with reduction pathways for limiting global temperatures rise to 1.5 degrees or well below 2 degrees compared to pre-industrial level temperatures. Target setting applying Science Based Target is recommended standard where possible.
- Measuring all relevant GHG emissions.
- Communicating and reporting at least annually on climate performance, preferably based on Task Force on Climate Related Financial Disclosures, increasingly including scope 3 emissions.
- Continuous development of company climate approaches, taking into account changes in the operating environment, evolution of climate science and best industry practice.
- Climate change is interconnected with other environmental and social issues. We also consider important that companies consider other environmental issues such as biodiversity and natural capital and aim for high overall ESG performance and comply with international norms.

Advocacy and partnerships

We engage in dialogue with various market participants and stakeholders, for example ESG and climate data providers, index providers, asset managers and non-governmental organizations to ensure continuous development of climate approaches of the financial industry.

We participate to number of important investor alliances on climate to advocate both public and private sector climate action to meet the goals of the Paris Climate Agreement.

Governance

This Climate Roadmap for direct listed equity investments is part of Ilmarinen Climate Roadmap and Responsible Investment Policy. Our Responsible Investment Executive Committee, including CEO and CIO, receive reporting and monitor the implementation of the Roadmap. At the highest level, the Ilmarinen Board or Directors receives reporting on and monitors of the Climate Roadmap and the underlying asset class specific climate roadmaps with the view to attain the 2035 target.

The Listed Equity Team, in collaboration with the Responsible Investment Team, establishes, implements and monitors the Roadmap.



Finnish Real Estate Climate Roadmap

Foreword

Published in October 2021, Ilmarinen's climate roadmap for Finnish real estate is one of a series of Ilmarinen's climate roadmaps. In this roadmap we describe our interim targets, the actions identified to achieve them and the indicators we use to monitor our progress towards our net zero carbon target in the investment of pension assets by the end of 2035.

The climate actions in our roadmap are highly dependent on multiple factors beyond our control. These include, for example, city planning and the climate action taken by the construction and energy sectors, as well as by materials suppliers. Taking these factors into consideration has been an important part of drawing up the roadmap.

At this stage, the measures concern the most significant sources of emissions. It is clear, however, that as the work progresses, we will leave no stone unturned. Going forward, we will increase our collaboration with industry actors who share our ambitions and will help us achieve our goal. Collaboration between various sectors and value chains plays an essential role in achieving both the climate goals set out in the Paris Agreement and Finland's national climate goals.

Tommi Aimonen, Head of Domestic Real Estate Investments



Introduction

Ilmarinen is committed to achieving a net zero carbon investment portfolio by the end of 2035. Our climate roadmap and asset-class-specific roadmaps describe how we will reach that goal. The documents are updated on a continuous basis. We take into consideration the continuous development of climate science, climate policy, technical solutions and the data available in the financial sector.

This asset-class-specific roadmap is part of the climate roadmap that covers the investing of pension assets as a whole. Our Responsible Investment Policy and related guidelines describe in further detail how sustainability is integrated into each and every investment decision. In addition to climate issues, the policy and guidelines encompass other environmental, human rights and stewardship themes. Further guidelines on real estate investments can be found in our guidelines for combating the grey economy.

[Ilmarinen's Responsible Investment Policy and Guidelines](#)

[How we operate: Combating the grey economy](#)

Sustainability and climate aspects guide our real estate investments. They are taken into consideration throughout the building's life cycle from design to construction and from use to demolition.

The built environment plays a major societal and economic role. The real estate and construction sector is responsible for more than 40 per cent of all greenhouse gas emissions globally. The built environment is responsible for more than a third of the energy consumption in Finland while causing about a third of the climate emissions from Finnish consumption. Currently, the majority of the emissions in the sector come from in-use energy consumption.

In 2020, real estate investments accounted for 12% of the invested pension assets. Finnish real estate made up 9% of the entire investment portfolio. Ilmarinen is one of the largest real estate owners and developers in Finland.

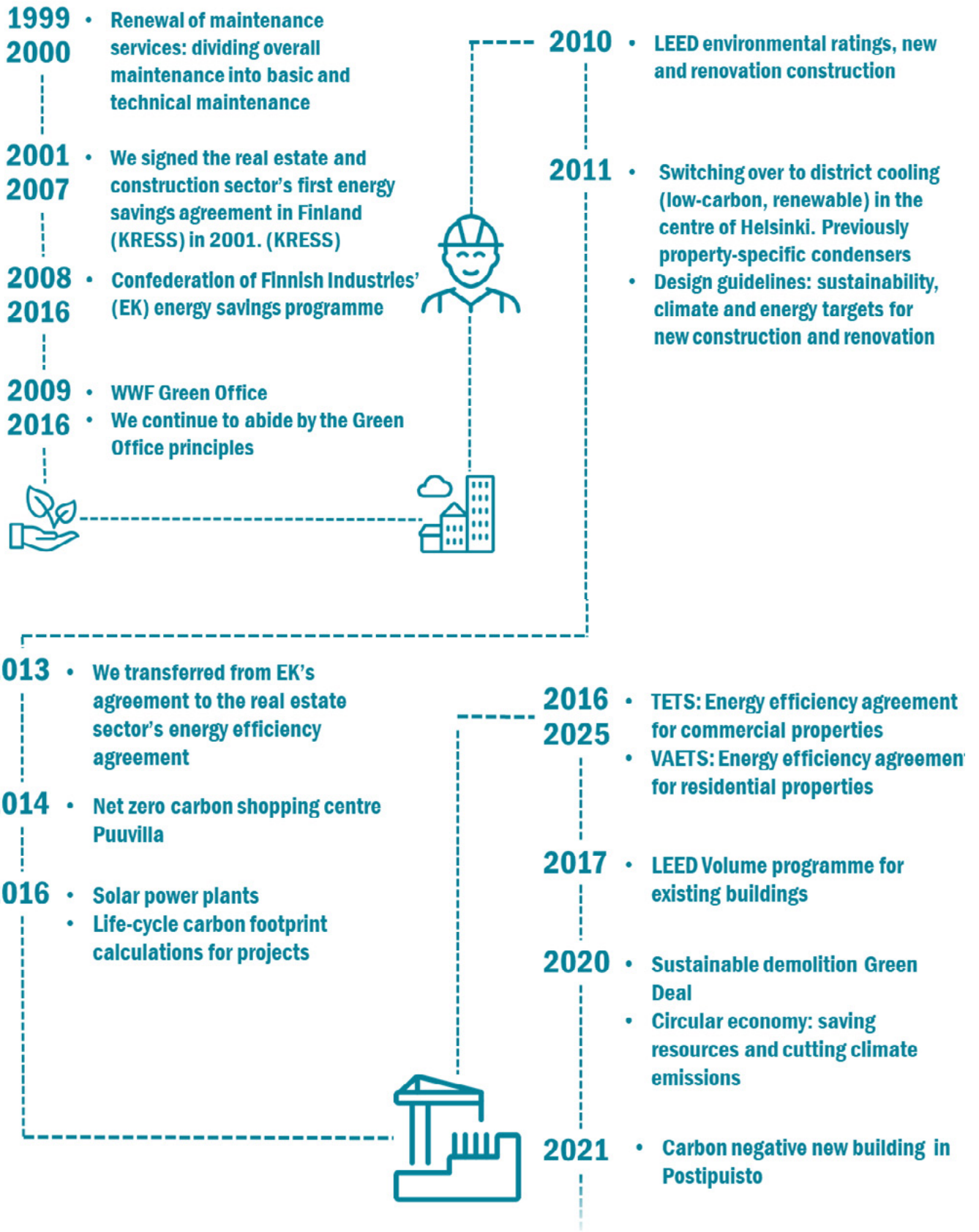
We want to be an inspirer and a leader. Together with our partners and the construction value chain, we want to create future climate solutions in the real estate sector. The transformation of the sector requires us to think outside the box.

Our climate roadmap takes the building's entire life cycle into consideration. We aim to reduce both use and construction phase emissions. We aim to adopt construction solutions that are as low-carbon and sustainable as possible. The optimisation of energy efficiency also plays a major role. Structural energy efficiency and sensible in-use energy consumption go hand in hand with a low-carbon economy.

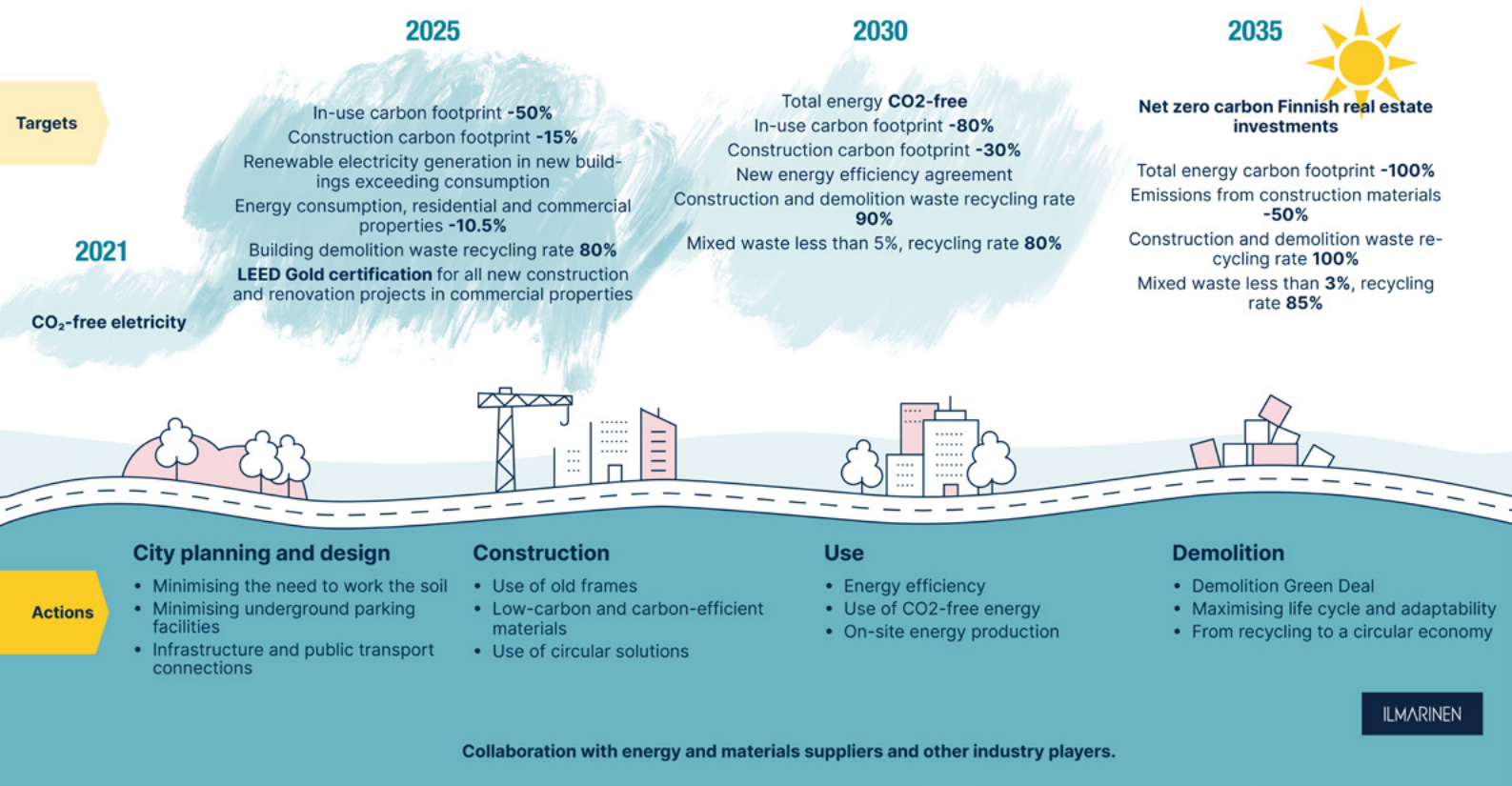
Increasing both energy and material efficiency and decarbonising the energy and materials used are key. The transition to a net zero economy will take place gradually. The first step is to achieve net zero carbon real estate investments for in-use electricity in 2021. For district heat, the net zero carbon target will be reached by the end of 2030 at the latest. It is possible that the life cycle of buildings will not be fully decarbonised by 2035. That is why compensation can be used as a complementary solution to achieve a net zero carbon life cycle for buildings.

The principles and targets set out in the roadmap will be implemented through internal guidelines concerning maintenance, design and property development.

Extensive co-operation throughout the value chain is required to achieve the climate goals. For the roadmap, we interviewed our key partners and stakeholders, such as energy utilities, materials suppliers and other real estate owners, as well as expert organisations in the industry. The roadmap is also backed by a comprehensive written fact-finding study. We take note of the climate roadmaps of other industry players and the future changes in energy emission factors. We have outlined the capabilities and the timeframe we have for reaching the lowest possible emissions and in-use energy consumption together with other market participants. These discussions have opened new doors for co-operation and allowed us to share ideas for a low-carbon built environment.



We invest in a sustainable future – We build sustainably



Backed by a long track record of sustainable and responsible real estate investment

We have engaged in systematic sustainability and climate action for more than 20 years. Our role and our track record in developing the industry have been recognised by, for example, the Developer of the Year 2019 award granted by RAKLI (Finnish association for professional construction and real estate). This is a solid foundation to work towards even more ambitious goals.

Commitments and collaboration

Collaboration between all the societal parties is required in order to reach the goals of the Paris Agreement. We are members in several groups that promote construction sector collaboration and climate solutions.

We are a member of Green Building Council Finland and we are considering joining the Net Zero Carbon Buildings Commitment, which is a promise to decarbonise the energy use in buildings by 2030.

We have also joined the Green Deal, which promotes sustainable demolition.

Furthermore, we are an ambassador of the FIGBC #BuildingLife project. The joint project involving ten European Green Building Councils aims to make the reduction of emissions from materials a key climate goal for the EU, its member states and companies.

Ilmarinen is also a member of the IIGCC. IIGCC members work together to find ways to achieve a net zero carbon investment portfolio, including real estate investments.

Climate goals must be sound. In 2021–22, we will look into the setting of a verified climate goal in line with the Science Based Targets together with our partners.

Key goals

2025 Low-carbon materials, low-emitting electricity, waste and resource efficiency

- Carbon footprint⁹
 - * The construction phase carbon footprint decreases 15%¹⁰
 - * The use phase/in-use carbon footprint decreases 50%¹¹ compared to the average in 2018–2020
- In-use energy
 - * The specific emissions from the district heat used by our buildings will be reduced by -33% by the district heating utilities compared to 2021
 - * Electricity¹²: 100% CO₂-free from 2021 on
 - * Renewable electricity generation in new residential buildings¹³ exceeding their own consumption
 - * In other new buildings and in existing buildings, we aim to make use of on-site renewable energy generation opportunities¹⁴
- Energy efficiency
 - * In addition to lower-emitting energy, the energy efficiency measures taken in buildings are crucial
 - * Commercial properties (TETS): Energy savings of -10.5% by 2025 compared to 2017 (minimum under the programme 7.5%).

⁹ In target setting and reporting, we use specific emissions per net square metres.

¹⁰ The benchmark we use is based on the average actual and estimated footprint of the construction of residential buildings completed in 2020–2022.

¹¹ Includes purchased heat and electricity. Weighted average with the real estate type allocation in 2018.

¹² All of the targets concern Ilmarinen's own electricity (Scope 2). We take into account the fact that in some buildings, all of the electricity is currently supplied by Ilmarinen and that the electricity consumed by the tenant and Ilmarinen cannot be told apart. In future, the tenant will be able to purchase their own electricity themselves in all the buildings. We encourage and guide our tenants to purchase electricity with the lowest possible emissions.

¹³ Applies to buildings where own electricity generation is technically feasible and permitted.

¹⁴ Applies to buildings where renewable energy generation is technically feasible, permitted and financially sound.

- * Residential buildings (VAETS): Energy savings of -10.5% by 2025 compared to 2017 (minimum under the programme 7.5%).

In 2021, already more than half of new residential buildings generated electricity in excess of their consumption using local renewable energy solutions

- Waste

- * Construction and demolition waste recycling rate 80% (design guidelines)
- * Waste management for existing buildings, mixed waste less than 9% and targeted recycling rate 75%

Our current design guidelines and contracts require a construction and demolition waste recycling rate of 70%. In 2021, the outcome is close to 70%. The target is 80% by 2025.

Simply switching over to renewable energy is not enough. Improving energy efficiency in new construction and renovation is crucial. In addition to increasing energy efficiency, the aim is to make use of all possible renewable energy sources.

2030 CO2-free heat and electricity

- Carbon footprint

- * The construction phase carbon footprint decreases 30%¹⁵
- * The use phase/in-use carbon footprint decreases 80%¹⁶ compared to the average in 2018–2020

- In-use energy

- * CO2-free
- * The specific emissions from the district heat used by our buildings will be reduced by at least -70% by the district heating utilities compared to 2021. Any remaining share of fossil energy will be replaced by purchasing CO2-free district heat.
- * Electricity: CO2-free from 2021 on
- * Renewable electricity generation in new residential buildings¹⁷ exceeding their own consumption
- * In other new buildings and in existing buildings, we aim to make use of on-site renewable energy generation opportunities¹⁸

- Energy efficiency

- * In addition to low-emitting energy, it is essential to improve the energy efficiency of buildings. The current energy savings agreements in place in the real estate sector will end in 2025. At that point, we will examine joining the next programme and set more detailed targets for improving energy efficiency.

¹⁵ The baseline is based on the average actual and estimated footprint of the construction of residential buildings completed in 2020–2022.

¹⁶ Includes purchased heat and electricity. Weighted average with the real estate type allocation in 2018.

¹⁷ Applies to buildings where own electricity generation is technically feasible and permitted.

¹⁸ Applies to buildings where renewable energy generation is technically feasible, permitted and financially sound.

- Waste
 - * Construction and demolition waste recycling rate 90%
 - * Waste management for existing buildings, mixed waste less than 5% and targeted recycling rate 80%

Net zero carbon 2035: Energy-efficient and safe buildings that are made from carbon-free or carbon-efficient materials and which use and generate renewable energy

- Materials
 - * Emissions from materials will decrease by 50% from 2017, in line with the industry target
 - * In-use energy
- We expect the district heating utilities we use to supply CO2-free energy in 2035
- Electricity CO2-free from 2021 on
- The total energy carbon footprint will decrease by 100% compared to the average in 2018–2020
- Energy efficiency
 - * The real estate energy efficiency programmes will continue
- Waste
 - * Construction and demolition waste recycling rate 100% of recyclable waste
 - * Waste management for existing buildings, mixed waste less than 3% and targeted recycling rate 85%

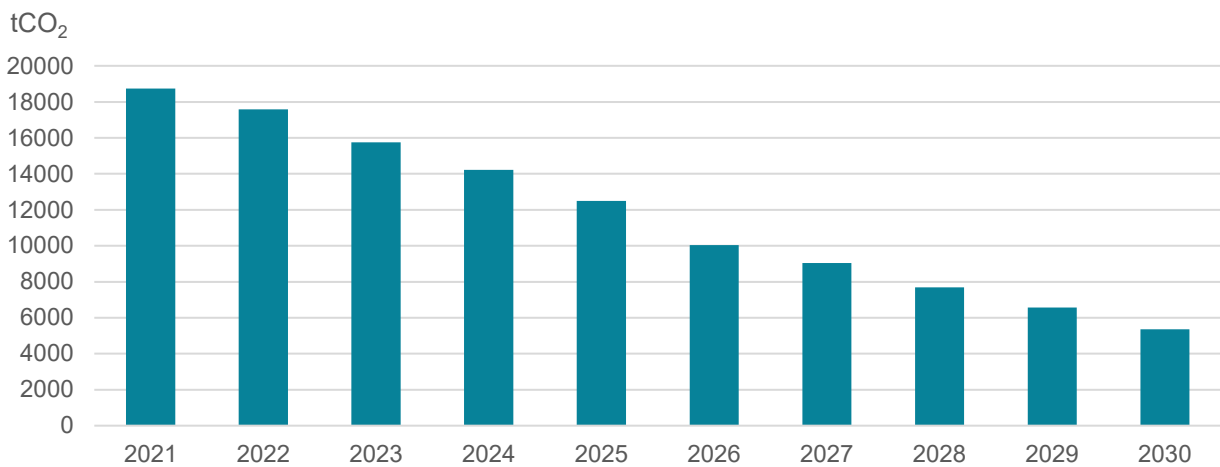


Figure 1 The cumulative specific emissions from district heating for the Finnish real estate portfolio, estimated based on the energy utilities' emission factors 2021–2030, the real estate portfolio in 2021 and the property-specific energy consumption in 2020

In our climate action related to energy, we apply the principle of mitigation hierarchy:

- Energy efficiency measures
- Increasing our own renewable energy
- In addition, purchased and ear-marked renewable energy through, for example, a wind power PPA
- Purchased renewable energy with a guarantee of origin
- What cannot be avoided or reduced will be compensated for

Actions and targets by phase

City planning and land use

A change in the regulatory environment is required in order to take into account and optimise low-carbon and circular economy solutions and bio-diversity already at the city planning stage and subsequent design steps. A new kind of climate-smart regulatory framework is needed.

Land use is a key determinant of carbon footprint. City planning that affects land use is carried out by towns and cities and various actors together.

We aim to engage with city planners to promote the integration of climate issues. In general, the engagement takes place through discussions with authorities and in particular, through collaborative city planning by identifying the climate impacts of the proposed plan and calculating the carbon footprints already when preparing the city plan. We bring our own strong climate goals and approaches to the table.

In our own city plans, we also aim to integrate other significant sustainability themes in addition to climate issues. These include biodiversity, social aspects, accessibility and green areas. For example, we aim to allocate roof tops either for solar power generation or for use as green surfaces.

In the city planning phase, we look into the low-carbon properties of the materials. We do not commit to a single material in order to be able to choose the best solutions with the lowest carbon emissions for every building.

Practical examples of climate action in the city planning phase

- Minimising the need to work the soil (foundation conditions)
- Preserving unbuilt land on the plot to enable the management of storm water and the growth of trees
- Taking into account existing and future infrastructure and public transport: the best possible existing or future connections
- Structures that are already in place on the plot will be preserved where possible or the materials will be utilised on-site in, for example, conversions
- Increasing the efficiency of land use through infill construction
- Maximising green areas beyond standard requirements: e.g. green roofs and evergreen yards, taking into consideration the use of pollinator-friendly plant species
- Parking space solutions: e.g. avoiding underground parking facilities, because they require the use of high-emitting materials
- Taking into consideration the energy solutions, i.e. heating and electricity: e.g. the opportunities to build and use renewable energy

Design

Our starting point is to take climate aspects into account in our design guidelines in addition to other key targets. The aim is to achieve long-lasting and material- and energy-efficient solutions. The end product is always healthy, safe and adaptable and retains its value. We

invest in properties located in growth centres near good public transport connections and services, and with completed or planned infrastructure. In line with our current design guidelines, we calculate both the construction phase and life-cycle carbon footprint for each project. Going forward, we will implement the targets of our climate roadmap within each project through design guidelines and agreements.

Most of the choices affecting in-use greenhouse gas emissions are made in the design phase. We aim to minimise the carbon footprint through design solutions, especially construction materials and in-use energy. In connection with new construction projects, we simulate energy architecture decisions and assess what renewable energy options are available to us, such as solar energy and geothermal heating and cooling.

The integration of climate, circular economy and biodiversity targets and guidelines was started in 2020. Key aspects in Ilmarinen's design guidelines are reuse and zero waste planning, system-level sustainability, i.e. replaceability of spare parts and the use of renewable energy – a sustainable circular economy is not possible without renewable and clean energy.

We will integrate climate, circular economy and biodiversity targets and guidelines into Ilmarinen's design guidelines.

Designing for the circular economy is continuous learning. In the design phase, it is crucial to unlearn old ways of doing and thinking. A shift in mindset and thinking is required to adopt a climate- and circular-economy-efficient approach in the design phase. Collaboration and dialogue are two further key elements in the design phase. Together with the entire value chain and material manufacturers, we aim to develop the best solutions in terms of the climate emissions of the projects throughout their life cycle.

We take accessibility into account already in the design phase. We have collaborated with the Finnish Association of People with Physical Disabilities FDP's Accessibility Centre ESKE on design since 2016.

Practical examples of climate action in the design phase

- We require a high-level environmental certification of all of our commercial properties for new construction and renovation (LEED Gold)
- We use in our in-use certification of properties the LEED v4 tool kit version, which has the strictest criteria of the versions in use.
- With LEED v4 certification, properties' tenants can impact their own premises and develop their sustainability. At the same time, the involvement of the property's users is a requirement for receiving in-use certification: in addition to technical solutions, especially the daily activities of the property and its users are monitored.
- A building's environmental rating, which is in force for five years at a time, is proof of comprehensive sustainability in the maintenance of the building.
- For Ilmarinen, the LEED certification is part of broader sustainability work that also takes into account other aspects related to the functioning of the building, in addition to energy efficiency. These include, for example, recycling and the environmental load caused by

cleaning. Accessibility using public transport and good traffic connections are further important considerations.

- The design solutions must always meet the following requirements: maintainability, serviceability, availability and replaceability of spare parts, energy efficiency, renewable energy solutions, carbon-efficient materials and solutions that stand the test of time.
- In the design phase, we examine the various alternative construction materials, systems and energy systems from the perspective of their carbon footprint and energy efficiency
- Long useful life requirements: at least 100 years for frames and load-bearing structures, 50 years for replaceable facades and at least 25 years for building services.
- The carbon footprint of every new construction project is calculated in the design phase. This supports designers when planning the project and the carbon footprint calculation will be adjusted to reflect the final plans. The objective is to expand the calculation also to renovation and conversion projects.
- The design takes into consideration the preparation for the weather stresses brought about by climate change (e.g. variations in precipitation, air humidity, storm winds)

Practical examples of integrating biodiversity and natural capital during the building life cycle

- City planning has a major impact on biodiversity and natural capital. We avoid unnecessary clearing of land to preserve old trees and the landscape in virgin environments.
- In conversion city planning we aim to preserve the buildings' old frames. This reduces the need for clearing new areas.
- We preserve unbuilt land.
- We preserve old trees.
- We follow the contours of the land when planning.
- We take into account the need for green areas from the perspective of, for example, pollinators.
- On-site solutions, e.g. local soil production in soil factories, insect hotels and other similar solutions to suit the building.
- Circular economy solutions and the use of circular products can reduce the need for new materials and thus preserve natural capital.

Adapting to climate change

According to estimates, the average global temperatures have already risen by one degree Celsius, and climate change adaptation is something that needs to be addressed today, considering the long life cycle of buildings. For real estate, key issues include flooding and changes in precipitation, wind and temperature conditions. When choosing materials in the design phase, we take into consideration protection from wind-driven rain, for example. This has an impact on the choice of surface materials and on energy solutions through a possibly increasing need for cooling in summer.

Design and city planning targets and indicators

In terms of city planning and design, we have set the following targets for real estate investments:

- Certification
 - * LEED Gold certification for all new construction and renovation projects in commercial properties by 2025
 - * LEED Volume certification for 50% of existing commercial properties by 2025, 100% by 2030
 - * We are working to find a suitable certification system for residential buildings
- Energy efficiency
 - * Residential buildings:
 - » As of 2022, all of our new construction projects will be implemented with an E value of ≤ 80
 - » In renovation projects our aim is to get as close to an E value of ≤ 80 as possible
- Commercial properties:
 - * A energy class for all new construction and renovation projects
 - * At least 30% relative improvement in energy efficiency in all of our renovation projects.
- Carbon footprint
 - * We develop project-specific life-cycle carbon footprint targets for new construction and renovation projects

Construction

We collaborate with construction companies. We engage in property development through a negotiated procedure or through competitive bidding. In construction phase climate action, the requirements and expectations on designers and construction companies are key. We integrate sustainability, responsibility and decarbonisation targets into the procurement procedure in all property development procurements, regardless of their form.

According to the calculations of the Confederation of Finnish Construction Industries (RT), construction accounts for around a quarter of the carbon footprint of the built environment. The majority (65%) of this, or two thirds, comes from materials and a third from worksite operations, transport and waste. Among these, the most significant carbon footprints are related to concrete and steel. These high-emitting materials are used in building foundations and parking solutions, in particular. This is why we calculate the carbon footprint for the entire building according to the permit process, both for the construction phase and over the life cycle of the completed building. We naturally include the foundation and the parking solutions in the carbon footprint calculation, because we want to disclose the carbon footprint in its entirety.

Close collaboration with materials suppliers is key to finding low-carbon materials solutions. We aim to use circular materials. The circular solutions currently in use need to be developed and expanded to evolve into large-scale solutions. Collaboration between social actors and a smart regulatory framework are key enablers in creating innovative solutions and making them mainstream. Individual players cannot do this alone. Low-carbon materials must always be healthy, safe, durable and economic.

When it comes to worksite operations, learning and sharing best practices across the value chain plays a key role. Engagement in worksite operations is primarily related to logistics, equipment and the worksite's energy consumption.

We pay attention to the energy consumed at the worksite, low-emitting logistics and electrical machinery, among other issues. In this, collaboration with construction companies is key. Another key aspect is a common mindset across the construction industry – the more building developers require strong climate action, the faster the industry’s decarbonisation and creation of new practical solutions will be.

The real size of the carbon footprint needs to be taken into account: 10–45% of the carbon footprint will be ignored if foundations and parking facilities are not included in the calculation. Finland is well on its way towards a low-carbon society. Construction plays an important role in achieving that goal. Reducing the life-cycle environmental impact of buildings will bring us closer to new kinds of cities built in line with the principles of sustainable development. However, a holistic approach to land use and construction is required to achieve a successful end result. There is a risk that the reform being prepared in 2021 will focus on the carbon footprint of individual building subsystems, omitting land use and the underground structures at the construction site from the overall estimate.

We have made calculations for more than 30 properties we have built. According to our calculations, not taking into account the share of underground structures means omitting 10 per cent at minimum and close to 45 per cent at maximum of the carbon footprint. Failing to take into account the real size of the carbon footprint will not promote the climate goals of Finland and the real estate and construction sector.

Practical examples of climate action in the construction phase

Reuse of old frames: reduces the construction-phase carbon footprint.

Change in requirements and industry mindset: requirements concerning low-carbon, sustainable and circular activities for construction companies and materials suppliers.

Use of circular materials to the extent possible, e.g. waste, excess and demolition materials

Zero-emission energy in the construction phase and low-emission and zero-emission work machinery and equipment

Low-carbon and carbon efficient materials

Logistics requirements: optimisation and decarbonisation of logistic transports

New energy and construction solutions

Designing the worksite area to enable recycling by material type

Guidance and training for main contractors’ and subcontractors’ worksite personnel

Collaboration with the energy industry.

Take a look at a completed project: Pasilan Postipuisto

Collaboration with the materials industry (launched as a result of the roadmap process)

Monitored targets and indicators related to construction

All construction projects net zero carbon in 2035

- Materials

- * Our aim is to use steel and concrete with less and less carbon. It is important to us that our key partners set a net zero carbon target that is aligned with our target. We already expect a year-on-year carbon footprint reduction of at least three per cent for materials compared to the 2020 baseline. We carry out carbon footprint calculations for each project based on the benchmark data. As a first step, we aim to create a baseline for key materials, such as steel and concrete. According to current information, the emissions from materials can be reduced -50% by 2035 compared to 2017.

- * In 2022 and 2023 we aim to calculate a baseline for key materials and set emission reduction targets for our own activities in line with the current industry best practice.

- Worksite operations

- * We calculate the carbon footprint for each project. At present, however, we do not know how large a share the carbon dioxide emissions from worksite operations make up of the project-specific carbon footprint. Measuring the emissions from worksites is currently a common challenge for the construction sector. Together with our partners operating in the industry we aim to calculate a baseline for the emissions from worksite operations and to create measurable reduction targets for them.

- Waste

- * According to our design guidelines, approximately 70% of worksite and demolition waste is recycled.

- * Targets for the construction and demolition waste recycling rate:

- » 2025: 80%

- » 2030: 90%

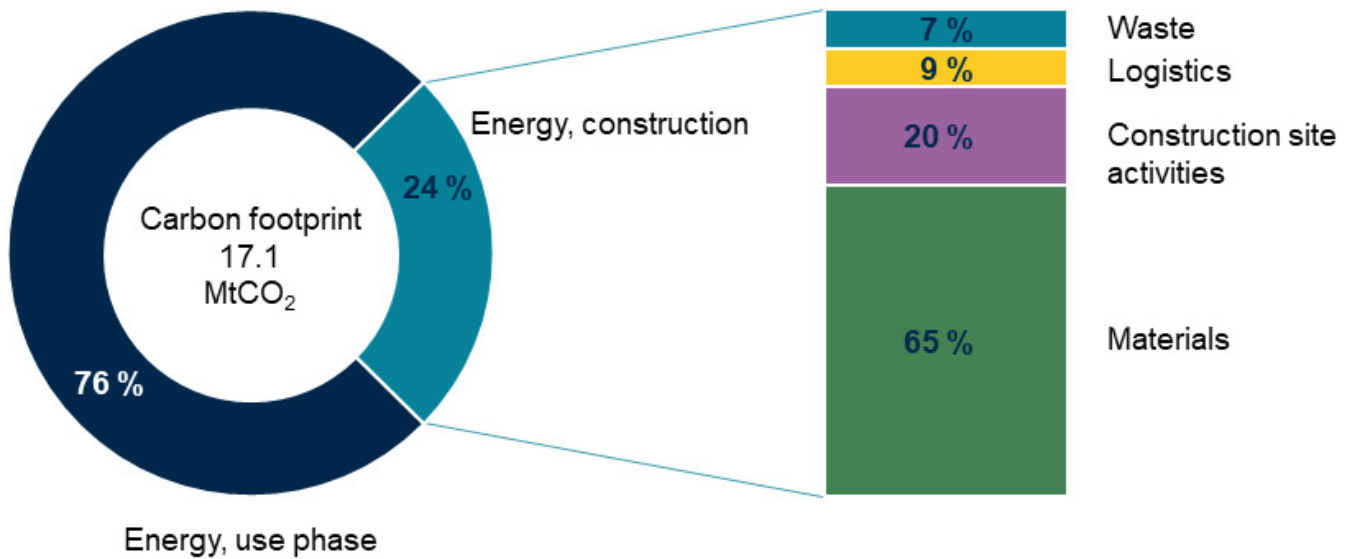
- » 2035: 100% of recyclable waste

Within the current regulatory framework, achieving a 100% recycling rate is not possible, because it does not allow for the recycling of all substances and materials.

Use phase

The most significant part of the carbon dioxide emissions from the built environment comes from the buildings' in-use energy consumption, with heating being the most important source of emissions. We outline policies in the design phase that will be decisive for the use phase.

The climate roadmaps of energy suppliers are an important foundation for our efforts to reduce the energy emissions from existing buildings. As part of our roadmap process, we collected the current and estimated future energy factors for our buildings from our energy suppliers. This allows us to identify the low-carbon solutions our energy suppliers can provide us with and what additional measures are required to complement them in order to reduce the carbon footprint caused by the energy consumption of our buildings. These additional measures include, for example, energy efficiency measures, certified renewable energy and our own energy generation solutions together with energy producers.



Total carbon footprint of construction and real estate (2017)

Source: Gaia Consulting

Practical examples of climate action in the use phase

Energy efficiency

We work actively to improve the energy efficiency of our real estate. Thanks to our successful measures, we exceeded the set targets. On the part of commercial properties, we exceeded the interim target (TETS) for 2020 (277%) and the final target for 2025 (184%). On the part of residential properties, we exceeded the interim target (VAETS) for 2020 (148%) and the final target for 2025 (99%).

The abbreviations refer to the Ministry of Economic Affairs and Employment's energy efficiency agreements that we have committed to. The target was to cut consumption by 7 per cent by the end of 2020 and by 10.5 per cent by the end of 2025 compared to the 2015 baseline.

Heat

We have compiled emission factors for all heat generators, which will enable us to move towards CO₂-free heat. Specific emissions from district heating will decrease 33% by 2025 and 70% by 2030.

Electricity

The electricity consumed by our real estate will be 100% CO₂-free by the end of 2021.

Local energy production

We aim to make use of all technically and economically feasible opportunities offered by the buildings for local renewable energy production. One example is the rooftops of logistics centres that can be harnessed for solar energy generation together with local energy utilities.

Cooling

In our properties located in the centre of Helsinki, we use net zero carbon district cooling, a solution that we switch over to whenever possible.

Environmental ratings

The commercial properties in the centre of Helsinki have Leed Volume certification. We are working to find a suitable system for residential properties.

Waste

Sorting waste at source, instructing and guiding customers.

The opportunities for and ease of sorting waste fractions in the properties' waste collection room are being improved together with waste industry operators. In the centre of Helsinki, for example, there is limited space for waste management. We will review the achievement of the target in each property. Mixed waste must be brought on a downward trend. Making tenants aware of the current situation and the targeted situation.

Occupancy rate

We aim to keep the real estate portfolio's occupancy rate as high as possible, at least on a par with the market.

Tenants

We will enable our tenants to purchase low-emission electricity, we will encourage their transition and inform them of the climate impacts of their choices.

We will provide tenants with property-specific carbon footprint information.

We will develop a carbon indicator for tenants

Targets and monitored indicators for use, maintenance and repairs

- Environmental ratings
 - * LEED Gold certification for all new construction and renovation projects in commercial properties by 2025
 - * LEED Volume certification for 50% of existing commercial properties by 2025, 100% by 2030
- Energy
 - * 2025
 - » District heating: specific emissions will decrease by 33% from 2021
 - » Electricity: 100% CO2-free from 2021 on
 - * 2030
 - » The specific emissions from the district heat used by our buildings will be reduced by -70% by the district heating utilities compared to 2021. The remaining share of fossil energy will be replaced by purchasing CO2-free energy.
 - * 2035
 - » We expect the district heating utilities we use to supply CO2-free energy in 2035
 - » Electricity: CO2 from 2021 on
- Biodiversity
 - * As of 2023, biodiversity will be taken into account in the modification work on outdoor areas
- Water
 - * 2025: We will reduce water consumption by 15% compared to 2017
 - * 2030: We will reduce water consumption by 30% compared to 2017

- Waste
 - * Waste management targets for existing properties:
 - » 2025: mixed waste less than 9% and targeted recycling rate 75%
 - » 2030: mixed waste less than 5% and targeted recycling rate 80%
 - » 2035: mixed waste less than 3% and targeted recycling rate 85%
- Repairs
 - * We will achieve at least 30% relative improvement in energy efficiency in all of our renovation projects.

CO2-free and renewable energy

In-use energy makes up more than 75% of a building's life-cycle climate impact.

The electricity consumed by our real estate will be 100% CO2-free by the end of 2021.

As for heat, we have looked into the emission factors of energy companies. In 2020, coal-based heat accounted for 35%, natural gas for 34%, wood, biofuels and other renewable sources for 15% and waste for 5%. According to Finnish law, the use of coal in energy production must be phased out by 2029. Specific emissions from energy utilities will decrease at least 33% by 2025 and at least 70% by 2030. Any remaining share of fossil energy will be replaced by purchasing CO2-free district heat by 2030.

Ilmarinen is developing an innovative partner solution for producing new renewable energy. Solar power plants are created on the rooftops of Ilmarinen's properties and Ilmarinen purchases or consumes the emission-free energy generated. This allows us to participate in the creation of new renewable energy generation.

In addition to renewable energy purchased from the grid, we are also looking for opportunities to generate new renewable energy through partners with a power purchase agreement (PPA).

Demolition

Little attention has been paid to the demolition of buildings from a carbon footprint perspective. When designing and constructing a building, demolishing it is not the first thing that comes to mind. However, it is in the design phase that the most crucial choices are made, even from this viewpoint. The more sustainable choices we make, the longer the period over which the environmental load caused by construction will span. The best solutions from the climate and circular economy perspectives are often those that do not require existing buildings to be demolished; instead, they can be repaired and converted to give them a new lease of life. It is also important to design buildings so that their structures can be reused to the highest degree possible. Demolition is a last resort, and we assess the need to demolish a building also from the climate perspective. The decision to demolish a building is affected by a number of factors, and sometimes demolition can also be the most climate efficient thing to do.

The demolition Green Deal was introduced in 2020, making recycling one of the criteria for projects.

Key means:

- Avoiding demolition
- Increasing the efficiency of land use through infill construction, thus also creating new,

- more energy-efficient buildings
- Maximising the building's life cycle in the design phase and designing for solutions that enable conversions, e.g. materials passport
- Circular economy
- Minimising demolitions, using the frames

Targets and monitored indicators for the demolition phase

According to the design guidelines for construction and demolition waste, a 70% recycling rate is required. In 2020, the recycling rate was around 70%.

Targets:

- 80% in 2025
- 95% in 2030
- 100% of recyclable waste in 2035

We are also looking into opportunities to set targets for the reuse of recycled and waste materials in the future.

Enablers and dependencies

In order for us to reach our goals, the regulatory framework and industry must also keep up with the development. EU legislation, including emission trading, has an impact on the decarbonisation of the industry and speeds up the sector's climate action.

In terms of industry, steelmaking, for instance, is a major source of emissions, and recyclable steel structures are a low-carbon solution. Another example is the development of hybrid materials by partly replacing high-emitting materials through renewable materials. This requires the harmonisation of construction design and its regulation, however.

Climate-friendly solutions can also be cost neutral

New solutions and materials can bring moderate additional costs before being scaled for the markets. In our experience, overall project cost levels can be optimised in project design such that climate-friendly real estate projects are cost neutral on an overall level.

Materials innovations are key – low-carbon materials must be developed. The full decarbonisation of high-emitting materials, such as steel, cement and concrete will probably require carbon capture, storage and utilisation (CCS, CCU). These technologies still need to be developed into scalable solutions. If fully emission-free scalable solutions are not created in the next few years, emission compensation is likely.

Climate action requires increasingly in-depth competence at different organisational levels. To reach the climate goals, the competence related to climate action in the organisation must be supported through, among other things, training. Climate action is taken into account in competence requirements and in the training provided at various levels of the organisation, and in a way that is adapted to different job profiles. Climate action can also be supported and implemented through reward systems.

The sector's ways of thinking and forward-looking attitude are important, especially in the design phase. This will scale up new patterns of thought and approaches that integrate climate considerations.

Low-carbon construction requires operators on circular economy platforms for the processing of demolition and excess materials, for example.

Collaboration across the chain is key for decarbonisation to be seamlessly integrated into all stages of a building's life cycle.

New materials and technologies affect the price through investments and costs. On the other hand, material efficiency can bring savings while sustainable solutions provide industry players with a competitive edge. Cost-neutral low-carbon solutions are a significant enabler of the sector's transition to a low-carbon economy.

New technologies, such as carbon capture and utilisation, play a major role in the decarbonisation of construction and particularly the production of construction materials. We hope to see these innovations come to life, but we do not use them as the foundation for our roadmap. That is why we expect some of the products to continue to cause emissions in 2035 and, with this in mind, we are reviewing compensation solutions.

Data sources

Reliable data is paramount for us to be able to measure our progress towards our goals using the chosen indicators. We work together with data service providers in, for example, calculating the carbon footprint and other environmental indicators. The carbon footprint calculation for new construction projects follows the principles of European standardisation (CEN/TC 350 Sustainability of Construction Works).

For energy, the calculations are based on both measured and computed data.

We also collaborate with key value chain partners. These include materials suppliers, who provide us with high-quality benchmarks for our goals and enable us to measure and monitor annual progress.

We report publicly in our annual report and our reporting is verified.

Glossary

Net zero carbon A situation in which the climate emissions from the activities and the greenhouse gases removed by the activities from the atmosphere (carbon sinks) are balanced, so that the net climate emissions are zero (carbon footprint – climate emission benefits = 0). When using the term net zero carbon, the review period, the calculation limits and the calculation method must always be indicated.

Carbon footprint A carbon footprint describes a product's or service's climate impact converted into carbon dioxide equivalents. The carbon footprint of construction and infrastructure projects usually refers to a life-cycle carbon footprint, but the term is also used to describe the annual emissions of an organisation, for example.

Carbon negative A situation in which the activities remove more greenhouse gases from the atmosphere than they produce during their life cycle, so that the net climate emissions are negative.

Climate emission Climate emissions (commonly also carbon emissions) refer to greenhouse gas emissions that cause climate change (see also greenhouse gas).

Building life cycle A building's life cycle covers all phases from the procurement of raw materials and products to the demolition of the building. The life cycle is divided into four phases: product phase, construction phase, use phase and end of life.

Construction carbon footprint The climate impact caused by construction and the transport of construction products from the manufacturer to the worksite. Includes life cycle phases A4–A5.

In-use carbon footprint The climate impact caused during the use phase of the building. Includes life cycle phases B1–B7.

Demolition carbon footprint The emissions caused during a building's demolition phase by the demolition, transport, waste management and disposal. Includes life cycle phases C1–C4.

Low-carbon energy Energy produced with low or no carbon dioxide emissions; produced with renewable energy sources, nuclear energy and/or waste energy.

Renewable energy Renewable energy refers to energy that comes from renewable, non-fossil sources. These include wind and solar energy (solar heat and solar electricity), geothermal energy, environmental energy, tidal and wave energy and other forms of ocean energy, hydropower and biomass, gas and biogas generated at landfills and water treatment plants.

Compensation In climate compensation, climate emissions are compensated for by investing in projects that have been developed for the sole purpose of reducing emissions elsewhere, for example, by strengthening carbon sinks or increasing renewable energy sources.

