



Viessmann Climate Report

Our LEAP to Net Zero

How we are leading a systems transformation towards net zero buildings





In 2121, we live in clean cities
and our buildings and
economy are climate positive.

2121 Our vision of a climate positive future

In 2121, we live in **clean cities**, and our **buildings and economy** are climate positive. Our buildings can adjust temperature and air quality in real time and bring health, comfort and energy services to people in their homes. These buildings, like the whole economy, are **circular** in their use and re-use of resources: all systems and materials within them are not only designed and manufactured for the long term but are also constantly repaired, recycled or recovered. They generate electricity for their own energy system using only **renewable** sources.

The **energy system** itself is now a network of **different grids** that intelligently collaborate and connect all buildings. The **energy and water grids** enable us to share and recover heat and cold. The **electricity grid** connects all buildings as one regenerative power plant. The **gas grid** enables us to use biomethane and green hydrogen, produced from wind and

solar energy. And the **information grid** enables us to optimise energy usage and to secure a supply of energy at the least cost, at all times, across all sectors.

We still live surrounded by the legacy of the **fossil era**. The disappearance of ice and rising seas, the burnt forests, the growing deserts, the toxic areas, the tens of thousands of extinct plants and animals, the extreme weather, the conflicts over water and food and the millions of displaced refugees. We have lost so much; we came far too close to losing nearly everything and if things had continued, we might have.

Instead, we live on a **healing planet**. Yes, much has been lost, but much has been saved and restored. And what has been saved and healed and made anew has given hope to people. The tide has been turned.



2021 — This is our vision of the future and this report explains how we at Viessmann will do our part to make it come true.

After a letter from our **CEO** followed by a review of the **climate opportunity**, an introduction to **Viessmann** and the company's **climate strategy** "LEAP to Net Zero", we will have a look at the whole range of **sustainability challenges**. Finally, what can we do? We know it is **time for action**, what steps can we take?

Letter from the CEO

As CEO of a more than 100-year old successful family business, I am keenly aware that we are at a climate crossroad and need to act rapidly to stabilize global warming at 1.5°C.

Our purpose of **co-creating living spaces for generations to come** motivates me and the more than 13,000 Viessmann family members across the globe every day. We will use all our passion, commitment, energy, partner networks and our climate solutions to lead a systems transformation to decarbonise buildings. It is our responsibility to provide people with solutions that reconcile our individual needs for warmth, cooling, clean

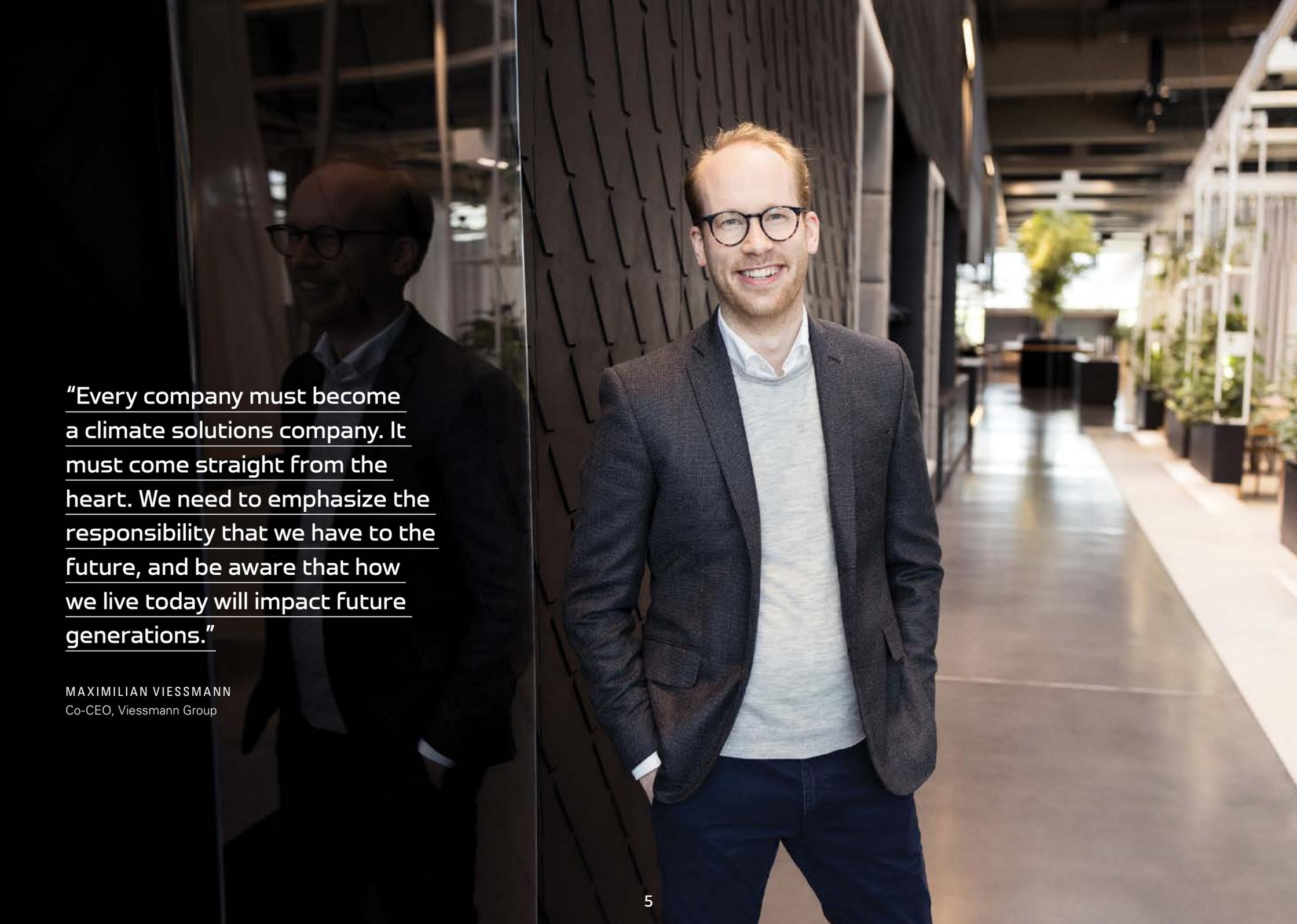
air and water, and energy in buildings with safe and just living spaces that are built on a social foundation and respect planetary boundaries.

Our **“LEAP to Net Zero”** climate strategy is founded on **Leadership, Empowerment, Advocacy** and **Partnership**. Enabling partners, users, communities, homeowners, tenants and the building sector to leapfrog towards climate neutral solutions.

We invite you to join our movement, to challenge and improve our approach and with us accelerate the transformation towards net zero buildings.



MAXIMILIAN VIESSMANN
Co-CEO, Viessmann Group

A photograph of Maximilian Viessmann, Co-CEO of Viessmann Group, standing in a modern office hallway. He is wearing a dark blazer, a light-colored sweater, and glasses, and is smiling. The hallway has a dark, textured wall on the left and a bright, open-plan office area with plants and desks on the right. The lighting is warm and focused on the subject.

“Every company must become a climate solutions company. It must come straight from the heart. We need to emphasize the responsibility that we have to the future, and be aware that how we live today will impact future generations.”

MAXIMILIAN VIESSMANN
Co-CEO, Viessmann Group

Understanding climate science

Science warns us that humankind is changing the climate of Planet Earth. Through greenhouse gas (GHG) emissions, we are heating up the planet and have already done so by 1.2 degrees since the start of the industrial era. Climate science projects that we will reach an increase of 4 to 5°C if we do nothing by 2050. This will lead to irreversible damage and regions of our planet becoming uninhabitable.



Why invest in climate solutions?

Investing in climate solutions benefits not only the environment, but impacts our air, health, economic and fiscal systems also positively. There are many socio-economic benefits, which can be realized through the systems transformation in the building sector. For example, benefits include¹ (all references and additional explanations are found on page 31):

€46-1,195
in annual savings
per EU household
due to lower
energy bills

€37-175 billion
in annual energy
savings due to improved
energy efficiency
at the EU level

€30-40 billion
in fiscal budget
annual savings due
to improved health
in the EU

1 million
jobs created in the
EU by investing €72
billion in building
renovations

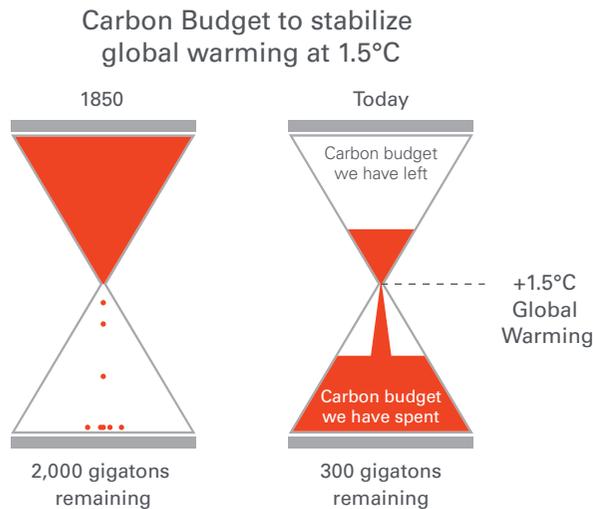
Fortunately, current emission reduction commitments adopted across the globe, if they are implemented, can put us on a 2.0°C to 2.9°C path. This, however, is not enough. And it stands in contrast to what world leaders agreed in the 2015 **Paris Agreement**: to limit global warming to below 2°C, keeping 1.5°C within reach. This is why the 26th UN Climate Summit in **Glasgow** is so crucial: World leaders, companies and people need to walk the talk. Together, we can close the gap with more ambitious emissions reductions.

The **costs of non-action** to combat climate change are far higher than the costs of action. For example, G7 countries would experience an annual average GDP loss of up to €4 trillion, remaining on today's emission levels. To put this figure into context: It is twice the economic loss experienced through the COVID-19 pandemic, and it would occur every year.

Carbon Budget and Net Zero

Two concepts- the carbon budget and net zero- are helpful to understand global warming limits.

At the start of the industrial era in the 18th century, humankind had no impact on Earth's natural carbon cycle - we were actually living in a net-zero world. Through science, we understand that the release of 2,000 Gigatons (Gt) of additional carbon dioxide into the atmosphere will lead to an average global temperature increase of 1.5°C. Adding up the amount of carbon dioxide actually emitted since the industrial revolution (app. 1,700 Gt) means that we only have 300 Gt left today in our planetary **carbon budget** if we want to limit global warming to 1.5°C. At the current rate of emissions released into the atmosphere, this remaining carbon budget will be exhausted in less than 10 years.



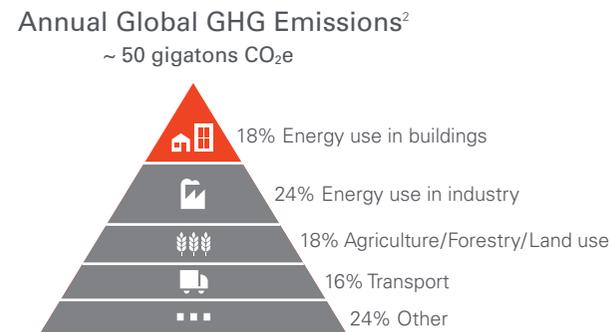
To stay within the budget, every country and every business needs to reach **net zero** as soon as possible. Net zero refers to a state in which the greenhouse gases going into the

atmosphere are balanced by removal of the same amount of greenhouse gases out of the atmosphere- the balanced natural carbon cycle. A country or business that reaches net zero is no longer climate negative but climate neutral.

Understanding those two concepts- the carbon budget and net zero - makes it clear: we urgently need to change paths and drive systems transformation towards net zero across all sectors.

The buildings sector is critical

Today, the **energy use of buildings** contributes to a total of almost 18% of all GHG emissions, making the sector one of the main emitters. When accounting for the embodied carbon of building materials and the indirect emissions of energy use (part of the "other" category in the triangle graphic below), that figure goes up to about 30%. A focus on driving a systems transformation in the buildings sector is therefore important.



The **reasons** for the large amount of emissions of buildings are numerous. Approximately 75% of all buildings and their heating systems in the EU are **not energy efficient** and only 20% are supplied with renewable energy. Yet, more than 85% of today's buildings will still be in use in 2050. Therefore, we

need to make our existing buildings **fit for the future** and ensure that new buildings are fully designed for net zero.

For both **existing and new buildings**, we at Viessmann will be part of the solution to drastically reduce emissions. How? Through our climate, refrigeration and ventilation solutions for living spaces. And this report makes transparent how we plan to do our part for a systems transformation in the buildings sector.

What does systems transformation mean for the building sector?

A transformed, net zero building system is characterized by three aspects :

- 1 Decarbonisation:** Renewable energy is used as the primary input energy for all living space services, on top of energy efficiency.
- 2 Decentralisation:** Electricity and heat generation systems are more decentralised and interconnected with our buildings.
- 3 Digitalisation:** Electricity and heat production and consumption are optimized via digital solutions.

Our company



“Climate neutrality can only be achieved in a collaborative manner. Partnerships and joint responsibility for living spaces for generations to come enrich all of us and multiply opportunities.”

PROFESSOR DR. MARTIN VISSMANN
Chairman of the Board

Over the past century, change has been our constant companion. Looking back at the key milestones in the Viessmann family history, it becomes clear that **enthusiasm for innovation** is embedded in our DNA. This is how we are forging a seamless link between our heritage and our future. We started as a small heating system manufacturer and have become **a global family business** that **co-creates living spaces for generations to come**. As one family with 13,000 global members, we develop climate, refrigeration and ventilation solutions today.

What do we mean by living spaces?

A healthy home, an emission-free environment where we live, work, learn and play; a planet in balance with environmental boundaries.

Viessmann at a glance

A family company with long term focus

- 4th generation of the founding family
- 13,000 family members across the globe
- More than 175,000 partners and installers
- €2.8 billion in total revenue

An enabler of a just energy transition

- 5% of annual revenue invested in research and development
- Energy efficient offerings for all energy sources and every household income level
- A market leader in heat pumps and hydrogen-ready solutions
- A focus on health, indoor comfort, air and water quality

A global business

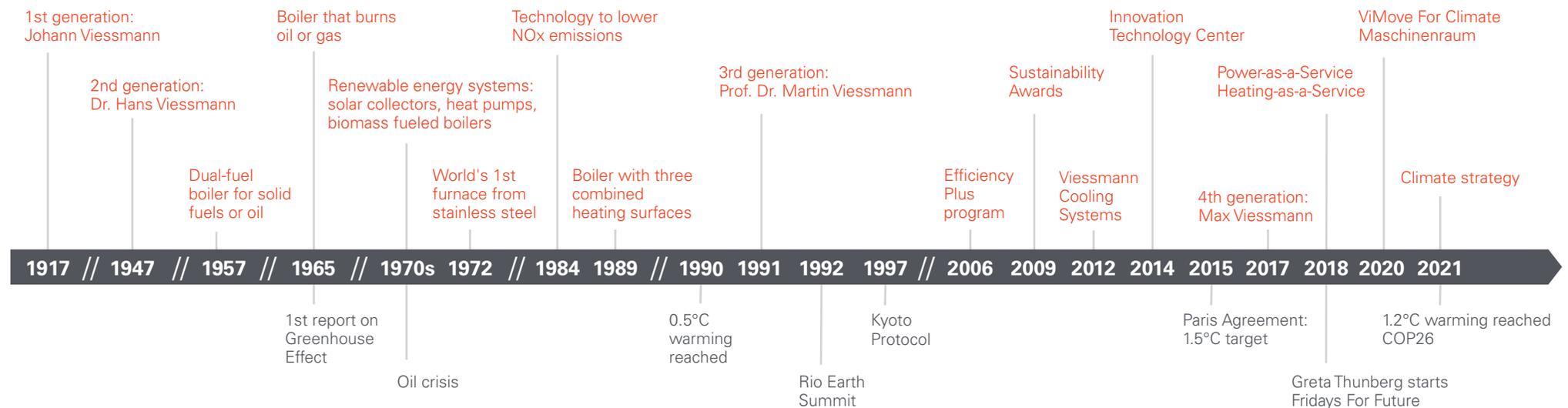
- 3 business areas: Climate Solutions, Refrigeration Solutions, Viessmann Invest
- 2 diversification areas: V/CO, Real Estate
- 1 Family Foundation
- 22 production sites in 12 countries
- 68 sales companies in 31 countries
- Strong growth internationally

A living purpose

- 95% green electricity use in Germany
- 50% decrease of own absolute CO₂ emissions versus 2005
- 33% renewable energy in total energy consumption
- 15+ incubation projects and 3 start-up ventures supported over the past 2 years

Key milestones in Viessmann's history

Our enthusiasm for innovation has enabled us to adapt and innovate in the past, and will do so for the future too. The timeline also shows key milestones of the history of climate change. The same timeline with further details can be found on page 31.



Our climate strategy

Looking at the urgency of climate change and our **heritage of embracing change** makes it crystal clear: **we can and must do more** to scale sustainable heating, ventilation and cooling solutions for everyone. We can and must do more to make our own operations future-fit. We can and must do more to lead a systems transformation towards net zero buildings.

We have gone through a thorough process of co-creation and as a result set ourselves a climate strategy that compiles what we plan to do.

Our **co-creation process** consolidated input not only top down from our company's leaders but also bottom up, from hundreds of Viessmann family members and external stakeholders.

All stakeholders stated clearly that climate action should be the number one strategic focus of Viessmann.

The **result** is our climate strategy **"LEAP to Net Zero"**. It builds upon four pillars for action: **Lead, Empower, Advocate and Partner** – **"LEAP"**: Together with our partners and stakeholders, we want to leapfrog, in other words take a giant step forward, towards reaching net zero in our own operations and the systems that we are a part of.

Our climate strategy visual shows that all four strategic pillars are **connected to our company's purpose**. This is because our purpose has guided our strategy and our strategy enables us to live up to our purpose.

Our LEAP to Net Zero



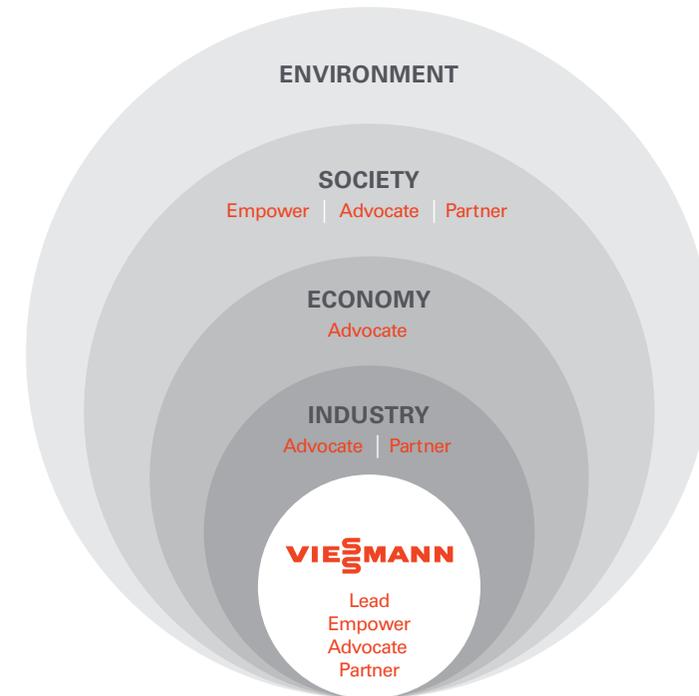
"None of the greatest achievements in history have come without a great deal of courage from individuals and communities. Yet courage is what we do not lack. We have proven it in the past and we will prove it again."

FRAUKE VON POLIER
Chief People Officer, Viessmann Climate Solutions

The envisioned future that we plan to achieve via our climate strategy “LEAP to Net Zero” is in brief the following:

	LEAP to Net Zero strategic pillar	Part of system to be transformed
	<p>We lead by example.</p> <ul style="list-style-type: none"> – Our operations will be net zero, regenerative, circular and embedded in healthy ecosystems. 	<ul style="list-style-type: none"> – Viessmann
	<p>We empower people to act.</p> <ul style="list-style-type: none"> – People will be empowered to radically reduce their CO₂ emissions and be prosumers- through our many climate solutions. 	<ul style="list-style-type: none"> – Society, Viessmann
	<p>We advocate to foster a movement.</p> <ul style="list-style-type: none"> – Employees and partners will be climate heroes. – Our brand will be the trusted partner for climate action. – We will be the thought leader for climate policies. 	<ul style="list-style-type: none"> – Viessmann, Industry, Society – Society – Industry, Economy
	<p>We partner to scale impact.</p> <ul style="list-style-type: none"> – Suppliers and partners will be empowered to radically reduce their CO₂ emissions. – The region around our headquarters will be net zero. – Our venturing and innovation activities will contribute to net zero. 	<ul style="list-style-type: none"> – Industry – Society – Industry Viessmann

Our climate strategy “LEAP to Net Zero” from a systems perspective



This is our envisioned future, the state that we aim to reach through executing our climate strategy. The visual illustrates which layers of the system that Viessmann operates in are influenced and transformed through our four strategic pillars.

Looking at our set climate strategy “LEAP to Net Zero” from such a systems perspective shows that we lead change beyond our own operations. As we are embedded in our industry, economy and society, and we all depend on our environment.

For parts of our climate strategy “LEAP to Net Zero” we have already set **two concrete, time-defined and science-based climate targets**, while for other parts we know where we want to go and are formulating some business models. We know it is the right thing to do, and there is still opportunity to define more details and find partners to help us get there.

Our Climate targets

In our climate strategy, we have committed that our operations will be net zero by 2050 (Lead). To get there, our concrete **first climate target** is to reduce the emissions from our own operations by at least 48% in absolute terms by 2030 (Scope 1 and 2 GHG emissions compared to 2019 levels).³ This means a 75% reduction compared to 2005, despite our high growth.

Also, we commit that we will empower people, partners and suppliers to radically reduce their CO₂ emissions (Empower, Partner). For the emissions reductions of supplying our materials and using our products, we set ourselves a **second climate target**: at least 55% reduction of Scope 3 GHG emissions in economic intensity terms by 2030 (compared to 2019 levels).³

To define our two climate targets, we went through a comprehensive bottom-up process as we did for our whole climate strategy.

We used two globally recognized accounting standards - **Greenhouse Gas Protocol and the Science Based Targets initiative (SBTi)** - to ensure our process is in line with climate science. We determined the emissions we are accountable for across Scope 1, 2 and 3 and what measures we have available to reduce those emissions, at what costs and what payback time. To do so, we analysed 70% of all our factories and buildings.

As a result we found that our corporate carbon footprint today is 79,485 kt CO₂e.



“Our engineering mindset is our best asset for the successful implementation of our climate strategy. We will apply the same thoroughness, tracking and corrective actions for the achievement of our climate targets as for the safe assembly and delivery of our products.”

DR. MARKUS KLAUSNER
Chief Technology Officer, Viessmann Climate Solutions

Our 2030 climate targets towards net zero

~50%
absolute emissions reductions of our operations (Scope 1 and 2)³

Scope 1: own operations and vehicles

Scope 2: purchased electricity, steam, heating, cooling

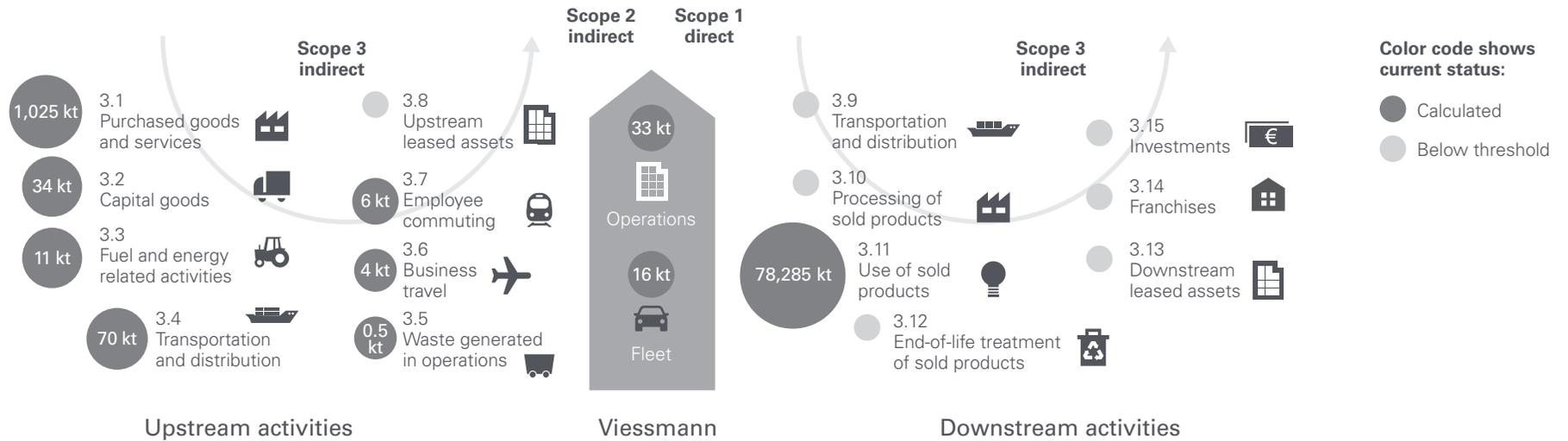
~55%
reduction of emissions intensity for our indirect upstream and downstream emissions (Scope 3)³

Scope 3: emitted indirectly upstream or downstream

Economic intensity: emissions related to a specific economic output

Viessmann corporate carbon emissions⁴

Scope 1, 2, 3 | 79,485 kt CO₂e | Base year 2019



Total Scope 3 indirect upstream emissions: 1,151 kt (1.45%)

Total Scope 2 indirect upstream emissions: 7.6 kt (0.01%)

Total Scope 1 direct emissions: 41.5 kt (0.05%)

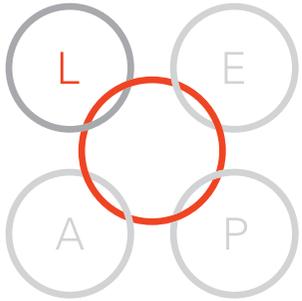
Total Scope 3 indirect downstream emissions: 78,285 kt (98.4%)

The importance of setting climate targets

In order to stabilize global warming at 1.5°C, we have very little of our global carbon budget left. To stay within the budget, every country and every business needs to strive to reach net zero, the state where the greenhouse gases going into the atmosphere are balanced by removal out of

the atmosphere. By implementing our climate strategy to reach our two science-based climate targets by 2030, we will get Viessmann's direct and indirect emissions on track to reach **net zero by 2050**.

In the next chapters, we explain each of our strategic action pillars in detail. Within the pillars Lead, Empower and Partner we will again refer to our two climate targets and explain how we plan to reach those.



Lead by example

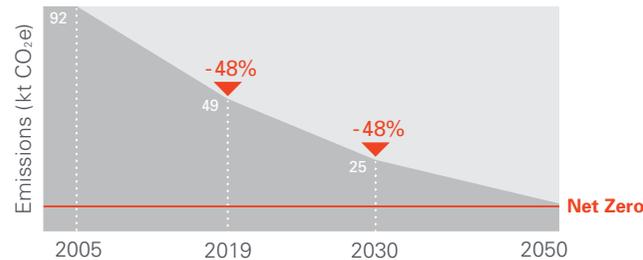
In this chapter, we explain what we do to lead by example to reach our envisioned future. As set within our climate strategy, we aim to reach a state where our operations are **net zero, regenerative, circular** and embedded in **healthy ecosystems**.

Net zero operations

We have a legacy of change that makes us confident to reach our net zero target for our operations: We have already reduced our Scope 1 and 2 absolute emissions over the past 15 years by almost 50% from about 92 kilotons CO₂e in 2005 to about 49 kt CO₂e in 2019. **Now we plan to do the same again:** Starting from our 2019 baseline level of about 49 kt,

we have started and aim to further reduce our Scope 1 and 2 emissions down to 25 kt CO₂e by 2030. This is the reduction level that is required by climate science to align our operations with a 1.5°C pathway.

Scope 1 & 2 emissions reductions



To reach our **first climate target**, we will invest more than **€60 million** over the next 10 years in the following measures:

First, we will continue the shift to **renewable energy** sources for our operations globally through new solar power plants and renewable heat supply, through heat pumps and green gases.

Second, we will further improve the **energy efficiency** of our production equipment and **waste heat recovery** of our facilities through advanced heat exchangers, added insulation, and upgrades of heat supply systems.

Third, we continue the shift towards renewably powered **e-mobility** in our company car fleet, combined with **renewable electricity** and other solutions that optimize manufacturing processes.

Given the demand for highly-efficient climate solutions in the renovation wave over the next few years, we will satisfy growing demand through additional manufacturing capacities. Those additional new factories will be developed and built **carbon neutral** from the beginning whenever possible. Pioneering carbon neutral factories will depend on the co-creation of integrated regional climate and renewable energy strategies - we stand ready as partners for developing those and call on the communities and businesses to join our effort.



"We are investing an additional €60 million to meet our climate targets, beyond what we had committed originally. This is a clear statement of how we are making an extraordinary contribution to climate protection and, in the process, honouring our purpose to create living spaces for generations to come."

DR. ULRICH HÜLLMANN
Chief Financial Officer, Viessmann Group

Regeneration, circularity and ecosystems

We not only want to make our operations net zero, but to go beyond and make them regenerative, circular and embedded in healthy ecosystems. To do so, we build upon our legacy of experience.

Circularity

Transition from linear material flows- from source to waste disposal- towards materials life cycle management. Circular operational models implement the concept of reducing materials use, reusing and recycling materials over and over again.

Regeneration

Operations and life cycle management models, which actively restore and replenish the sources and sinks of our ecosystem.

We are successfully operating an **environmental management system** based on ISO 14001 at group level. This is our starting position towards enhancing circularity and the regeneration of our sites and material flows.

One achievement of continuously improving our operations towards **circularity and regeneration** via our management system lies in recycling. To ensure high value recycling of different waste from our operations today, we are already collecting over 100 different types of waste on all our sites. At our headquarters operations in Allendorf, Germany, we have achieved a waste separation collection quota of more than

EMAS certification

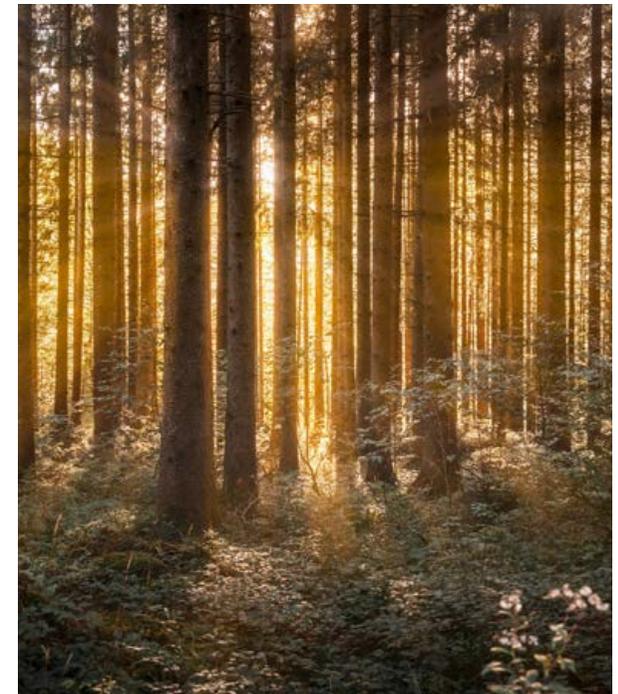
EMAS certification The EU Eco-Management and Audit Scheme is the most stringent global audit scheme. The Viessmann Group was the first company in the heating technology sector and the second company in Germany to obtain EMAS certification in 1995. The Viessmann site in Allendorf is currently the oldest entry in the EMAS register. Since then, we have focused on continuous improvement, stringent validation and transparent reporting around our integrated environmental management and performance. We have worked continuously on increasing the resource and water efficiency of our operations. Since 2005, we have reduced our waste and water intensity by more than 50%. Also, we have reduced the resource intensity of steel, one of our main raw materials, by more than 50% through the introduction of new modular production concepts and continuous efficiency improvements.

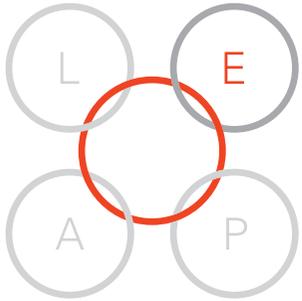


96%, enabling us to successfully recycle and recover over 90% of the waste we collect.

As shown in our systems map on page 11 before, we all depend on the environment. Therefore, reaching a state where our operations are embedded in **healthy ecosystems** is crucial. To act according to our commitment, Viessmann manages several thousand hectares of sustainable forest and moorland.

Our systems, processes and achievements make us committed to continue our path and do more. Going forward, we build upon our achievements and develop concepts which will further move our operations towards circularity, regeneration and healthy ecosystems. Inspired by the pioneering concepts of **industrial biomimicry** - such as "Factories as a Forest" - ultimately, the manufacturing of our products should increasingly utilize those recovered material streams from dispersed sources, evermore energy-efficient processes, fueled by sequestered carbon from fast growing wood plantations and renewable energy, which will help to establish net carbon sinks.





Empower people to act

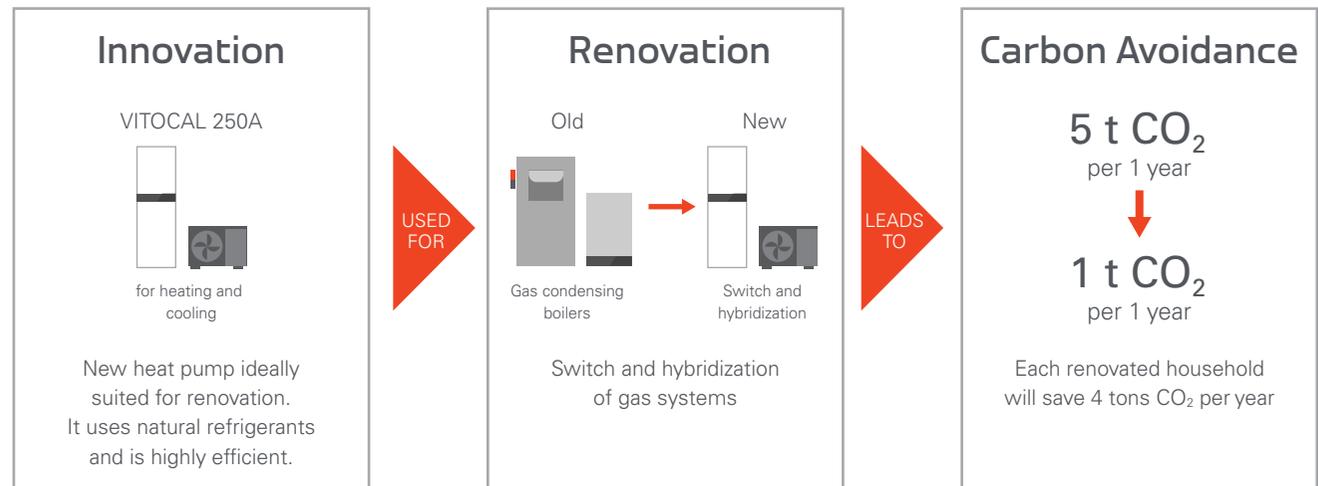
In this chapter, we explain what we do to empower people to act for climate. As set within our climate strategy, we explain the many ways in which our **products and services** enable people to radically reduce their CO₂ emissions and become prosumers.

Prosumers: producers and consumers of electricity

Every household that has a photovoltaic installation produces and consumes electricity at the same time, but also tenants benefit from a shared PV installation.

Today, we empower people by providing affordable climate solutions for every building type and household income level. To do so even more in the future and to lead a systems transformation towards net zero buildings, we have set ourselves a **second concrete climate target**, which we introduced on page 12: We will reduce our current Scope 3 emissions by at least **55%** in economic intensity terms by 2030. These targets - scope 1, 2 and 3 are interim targets in line with climate science to achieve net-zero operations by 2050.

150 million tons cumulative emission savings through Viessmann products in the next 10 years⁵



To reach our Scope 3 reduction target, we will implement three sets of measures: undergo a massive product and service portfolio shift, strive to make the environmental product performance transparent and verifiable and develop new business models.

We understand that we do not control the achievement of this target and that many other variables have an impact, but we will do everything in our power to influence it. **We invite all stakeholders in the building sector to help.** Frameworks, regulations and financing of a continued massive ramp up of renewable electricity generation and adoption of ambitious renovation targets are critical prerequisites and can only be achieved through collaboration and **co-creation at all levels.**



“Our sustainability management program is largely based on the passion of our 13,000 family members worldwide. For such an achievement in the area of climate protection to be possible at all, all areas of the company and beyond must work closely together with the spirit of co-creation.”

THOMAS HEIM
Chief Sales and Marketing Officer,
Viessmann Climate Solutions

What we will do to empower people to act ...
<p>Product and service portfolio shift</p> <ul style="list-style-type: none"> - Renewable electrified heating systems - Hybrid solutions - Green gas and hydrogen systems - Smart home energy management systems - Ventilation, refrigeration relying on natural refrigerants, smartstore concepts and industrial solutions <p>Environmental product and service performance</p> <ul style="list-style-type: none"> - Life cycle assessment framework - Environmental product declarations <p>New business models</p> <ul style="list-style-type: none"> - Climate-as-a-Service - Power-as-a-Service - Heating-as-a-Service 	<p>Integrated system solutions</p> <ul style="list-style-type: none"> - Prosumers - Energy Communities - Energy Districts
... for a systems transformation towards net zero buildings	

Product and service portfolio shift

Renewable electrified heating systems: We focus on shifting our portfolio towards the electrification of heating systems mainly via sustainable heat pumps (Vitocal) based on natural refrigerants. Direct electric heating (Etherma) is also an option for new, highly insulated, active house concepts.

Hybrid solutions: With the objective to double the share of renewable energy in heating, we will shift towards the hybridization of heating systems via coupled gas boilers and heat pump systems (Vitocaldens), photovoltaics (Vitolv) and solar thermal systems (Vitosol).

Green gas and hydrogen systems: We will adapt combustion heaters (oil and gas boilers) to green gases and hydrogen to avoid the lock-in of fossil fuels, and offer additional options for the renovation of existing buildings.

Hydrogen in more detail

All Viessmann gas boilers are already able to run on biomethane and are certified for operation with up to 20% hydrogen (H₂) admixture from the gas grid. We plan to have the gas portfolio 100% green hydrogen ready by 2025. With future-ready systems, Viessmann customers will be fully flexible and future-proof, able to easily switch to green energy carriers once available in their neighbourhoods.

Product and service portfolio shift | continued

Smart home energy management systems:

We will optimise energy flows to reduce energy consumption and increase energy system resilience via home energy management systems, smart controls such as weather compensation and smart demand-response, including e-mobility. We promote the modernisation of aging heating systems.

Ventilation, refrigeration and industrial solutions: Capturing waste energy for utilisation in other energy systems is one benefit of integrated climate solutions for large buildings. For homeowners, we believe that the attractiveness and buy-in of climate solutions integrating heating, cooling and ventilation can be increased further when combined with tangible non-energy related benefits such as increased comfort, higher quality of sleep because of optimal room temperature, and health benefits via optimal indoor air quality. We are, therefore, investing heavily in ventilation, sensors and other health-related solutions.

Environmental product and service performance

We will implement a holistic **life cycle assessment** (LCA) framework of our main products and services, based on the ISO 14044 standard. Integration of the LCA framework enables us to proactively identify and address hotspots in the different life cycle phases and implement design for sustainability initiatives and practices.

To promote a holistic approach in assessing the environmental performance of buildings along all relevant environmental impacts, we will test and develop **Environmental Product Declarations** in line with the European Standard EN 15804 to inform our partners and customers about a building's carbon footprint.

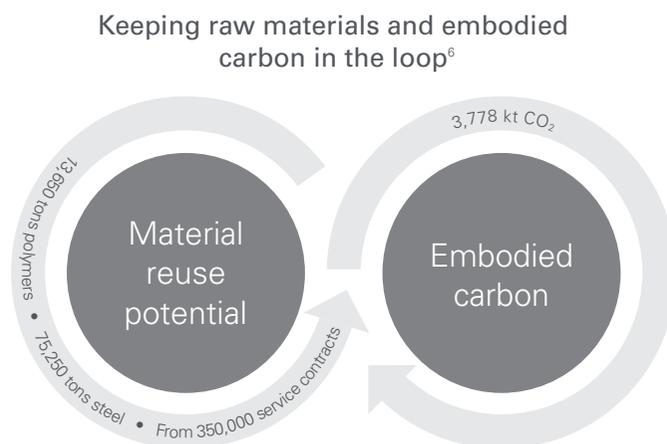
New business models

Climate-as-a-Service: We will further scale up our new Climate-as-a-Service business model. Climate-as-a-Service helps to optimise and scale the use of financial support schemes for the modernization and renovation of buildings.

Power-as-a-Service: Our business model Power-as-a-Service brings together prosumers in an energy community that are passionate to increase self-consumption and be role models in renewable energy.

Heating-as-a-Service: Our new business model Heating-as-a-Service makes efficient heating solutions available on a monthly fee basis, thereby displacing the high upfront investment costs and including a full service to maintain and repair the system, keeping it at optimal operating conditions.

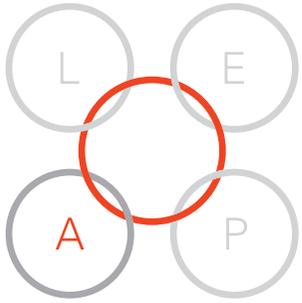
Through leveraging the potential of service-based business models for heating, cooling and ventilation, tremendous material streams, including embedded carbon emissions can be circularized- making buildings more regenerative.



Heating-as-a-Service in more detail

The dematerialization of climate solutions will be an enabler of increasingly circular material flows as we move towards the sale of comfort, e.g. indoor temperature or air quality, instead of hardware. That way, the physical system remains part of a controlled cycle and the system components can be reused and recycled as technical nutrients in our operations. Already today, thousands of households in Europe are using our heating service and looking ahead. Market research suggests that the willingness to switch to service based heating contracts will be at 10% of the heating market by 2030.

Heating-as-a-Service is also instrumental to address two critical elements of the renovation wave: it removes the upfront costs of heating systems and it externalises the management of increasingly complex heating systems. Thereby removing two important barriers to the uptake of low carbon renewable heating systems and securing peace of mind for their users.



Advocate to foster a movement

In this chapter we explain how we foster a movement. We explain how we turn our employees and partners into **climate heroes**, make our **brand** the trusted partner for climate action and become the **thought leader** for climate policies.

Climate heroes

We enable partners, customers and Viessmann family members to become climate heroes- agents of change and multipliers for the net zero transformation in their local communities. To do so, we are doing three things:

- 1 We are currently testing **new services and tools** to empower people to track their CO₂ footprint and take action in a collaborative way,
- 2 We educate and empower more than 130,000 participants per year via the **Viessmann Academy**,
- 3 We incentivise and reward installers for the sale of sustainable, future-proof products via the **partnership program V+.**⁷

ViMove for Climate

We are using our brand and raising the awareness of climate action via our **ViMove for Climate**⁸ campaign. Participants advocate for climate action by playing sports. We reward and incentivise activities by planting trees in our own managed forests. So far, more than 8,000 users from 49 countries have registered for ViMove and have jointly contributed. We have planted 834,703 trees around the world since 2020. By the end of 2021, we will reach 1,000,000 planted trees and start to make our campaign under the name **Move for Climate**⁹ available to other interested companies.



Thought leadership for climate policies

We leverage our long standing expertise and experience to co-create the regulatory framework needed to accelerate the decarbonization on a global scale.

We advocate via the leading organisations in which we are members. Some examples of our advocacy leadership include international groups such as the UN Global Compact, the UN Global Alliance for Buildings and Construction (GABC), the Energy Efficiency Financial Institution Group (EEFIG), and the prime mover group of ENTSO-G. Being present as a manufacturer and having a strong market presence in the EU, the European Heating Industry Association (EHI), Hydrogen Europe and national associations in our main markets, such as the German Heating Association (BDH) and German National Hydrogen Council, offers complementary advocacy pathways to drive and influence the evolution of climate policies on regional and national level. We use those to amplify our commitment and inform policy makers and regulators on the framework conditions required to foster the transformation and co-create a net-zero society.

Further, we are continuously collaborating with leading universities across Europe. From creating a heat generator system for the development of low-emission building energy technology with German universities to developing a patented new foaming concept with a fully automated process with French research institutes, our goal is to provide cutting edge innovation in the sector of heating and cooling.

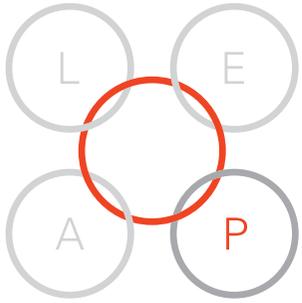
Regulatory frameworks for sustainable heat pumps

Our engagement goes further. Through participation in political and regulatory fora, we strive to fill the knowledge and data gap on heating in buildings and the interaction with the energy system. One focus area is heat pumps: meeting building decarbonization targets requires large volumes of heat pumps. The key for success is that they are sustainable- driven by natural refrigerants, silent, with optimised energy efficiency in actual use, and ready for a future electricity system with demand-side flexibility and coupling of demand to on-site PV generation.

Hydrogen-readiness of combustion technologies

Another focus is hydrogen readiness. We are actively involved with the German National Hydrogen Council and the European Clean Hydrogen Alliance to steer the development of product regulations and standards transforming the market towards combustion technologies that are ready for future-proof decarbonized energy carriers.





Partner to scale impact

We partner to scale impact. **Suppliers and partners** will be empowered to radically reduce their CO₂ emissions. The **region** around our headquarters will be net zero and our corporate **venturing and innovation** activities will further contribute to net zero by creating new business ideas and a cultural change. How we plan to do all this is explained in this chapter.

Etanomics for net zero value chains

We are committed to empowering our partners and suppliers to radically reduce their CO₂ emissions and for that purpose set our **second climate target**: reduction of our Scope 3 emissions by at least **55%** in economic intensity terms by 2030 versus 2019. This target is in line with climate science to stabilize global warming at 1.5°C.

We aim to reach that target through our **Etanomics**¹⁰ subsidiary and our updated purchasing policy. Etanomics combines extensive knowledge and experience from implementing integrated energy and emission management systems and achieving significant reductions in carbon emissions and energy costs. In fact, the Efficiency Plus program that enabled Viessmann to achieve the German

government's energy targets for 2050 in 2012-38 years early-was the birthplace of Etanomics. Beyond the company's work as the central energy management contractor for Viessmann, Etanomics has implemented 600 projects for clients and partners, especially in the industry sectors of health care, life science and hospitality. Going forward, Etanomics will leverage its track record and work with our suppliers and partners to reduce their emissions.

Mission Zero for a net zero region

Our **Mission Zero**¹¹ is a non-profit association that aims to make the Waldeck-Frankenberg district around Viessmann's headquarters climate neutral. The association is a regional alliance of committed and ambitious partners who want to make an active contribution to climate protection. Networking events and support through climate ambassadors bring all the members together. By signing the association principles, members commit to identifying emissions reduction potentials, defining appropriate measures and developing a decarbonisation strategy. Our Mission Zero was officially founded in 2021. The next step is to build up the association and invite interested parties to become members to help us reach our vision: to make our region climate neutral by 2035.

Net zero venturing and innovation

While solutions to mitigate climate change already exist, a successful systems transformation will require many new business ideas and a cultural change within our companies. That is why we have created two organisations:

WattX¹² is an incubator platform for the generation of ideas and innovative business models addressing complex challenges. WattX has successfully supported more than 15 incubation projects and 3 start-ups over the last two years.

Maschinenraum¹³ unites the power of German Mittelstand and family-owned businesses to build sustainable solutions for the future. It does so by building an open peer-to-peer environment for long-term collaborations and innovation. In this shared innovation ecosystem Maschinenraum builds awareness and connections to new realities, it shapes the mindsets and agendas of organisations and facilitates execution and collective action for innovation and courage in Germany.

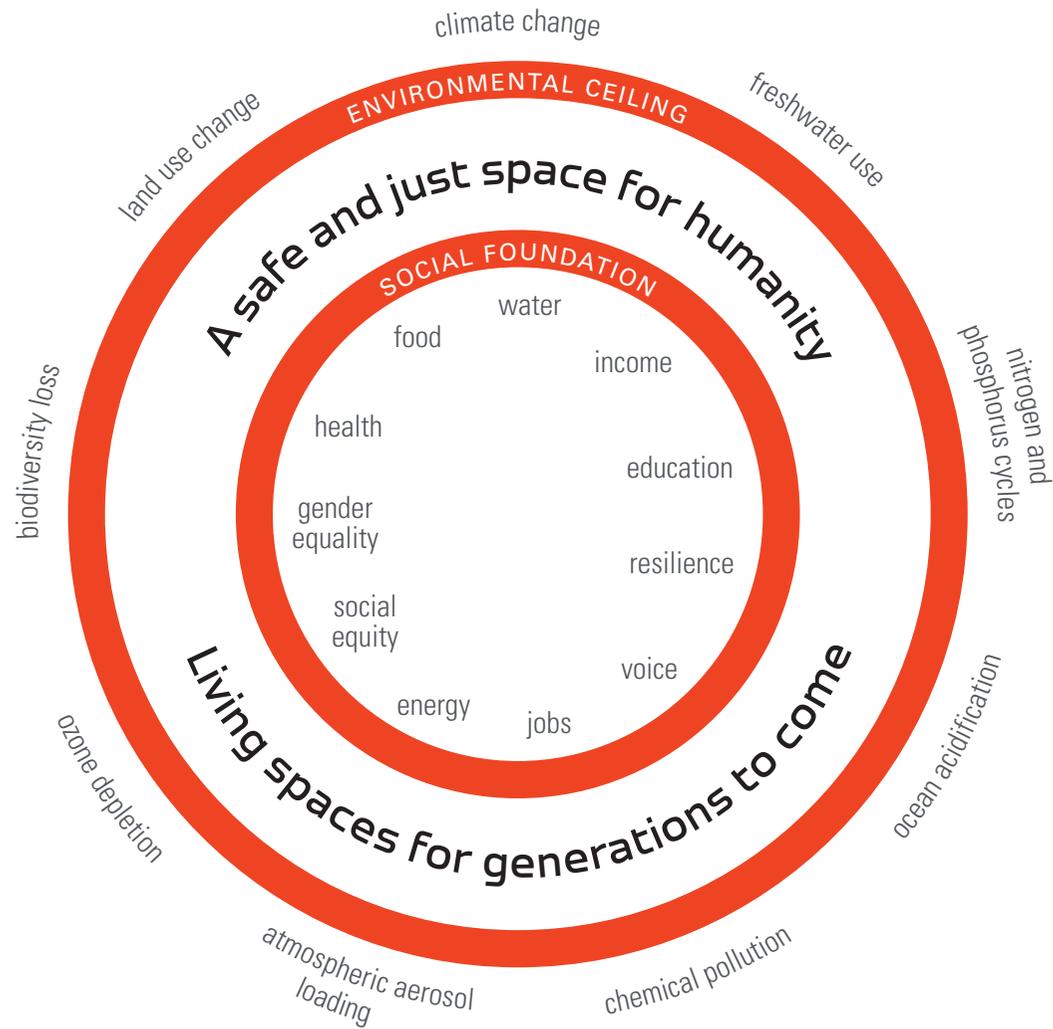
Looking beyond climate

This report makes our climate strategy known to the world. It is yet another step on the sustainability journey of the global Viessmann family, which started more than 100 years ago. We know that the sustainability agenda is broader. We will therefore focus on three things: execute our climate strategy, define the rest of our sustainability strategy and report on progress.

This is how we continue to walk the talk, to co-create a sustainable future, to live up to our purpose to co-create living spaces for generations to come. We invite you to join us. Get inspired on how you can take action for the climate.

The Doughnut Model¹⁴

The “Doughnut model” conceptualizes a sustainable state on Planet Earth for humanity. In a sustainable future, the safe and just space for humanity is built on a social foundation and respects the environmental ceiling, the planetary boundaries. The model provides a first overview on the full range social and environmental challenges that humanity has yet to achieve.



Call to action

W

e need to create living spaces for generations to come. Now. Here are some concrete proposals on how to take action.

As stated earlier, for parts of our climate strategy “LEAP to Net Zero” we know exactly what we will do. For other parts, we know where we want to go, we know it is the right thing to do, and there is still opportunity to find partners to help us get there. So here is our summary of how we can help each other.



What we will do	What we can do together	What you can do
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We **lead** by example.

- Our operations will be net zero, regenerative, circular and embedded in healthy ecosystems.

We know it is still a long journey for us to become circular, regenerative and embedded in healthy ecosystems. Likewise, it will be a challenge to build new factories and buildings that are carbon neutral. For both, we look for **new partners** who can help us accelerate our journey.

As a **business**, get inspired by our example. Get your own operations to net zero and beyond circular, regenerative and embedded in healthy ecosystems.



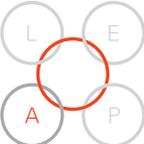
We **empower** people to act.

- People will be empowered to radically reduce their CO₂ emissions and be prosumers- through our many climate solutions.

As an **individual**, you can radically reduce your CO₂ emissions and become a prosumer, get in contact with us or our partners to find out about suitable net zero climate solutions.

As a **business**, follow our example. Assess your portfolio and develop a plan to empower people through net zero climate solutions.

As a **partner**, become a co-creator of local and regional climate strategies, leveraging our solutions and increasing the speed of building modernization and the build-out of renewable energies.

What we will do	What we can do together	What you can do
 <p>We advocate to foster a movement.</p> <ul style="list-style-type: none"> – Employees and partners will be climate heroes. – Our brand will be the trusted partner for climate action. – We will be the thought leader for climate policies. 	<p>As an individual or partner, become a climate hero. Approach us if you want to join our testing phase of new services and tools to track your CO₂ footprint or learn more about our V+ program for partners.⁷</p> <p>As an individual, take climate action: Join our next ViMove For Climate campaign.⁸ Become active and help us plan 1 million trees.</p> <p>As a business, we are starting to test Move for Climate⁹ with interested companies. Approach us if you are one of them.</p>	<p>As an individual, be aware of your carbon budget and how to reduce your carbon footprint, be a teacher and advocate for climate positive solutions in all areas of your day to day life. Become a climate hero.</p> <p>As a partner, train your employees and foster the adoption of new and innovative climate solutions with your customers. Raise awareness with the end users on the positive impact they can have.</p> <p>As a policy maker, support climate policies that accelerate the journey towards a net zero economy. Foster the decarbonization of our living spaces through acceleration of the building renovation and the modernisation of their heating systems, and ensure the continued massive build-out of renewable energy technologies such as wind and solar energy and green gases, to really become the backbone of our economy.</p>
 <p>We partner to scale impact.</p> <ul style="list-style-type: none"> – Suppliers and partners will be empowered to radically reduce their CO₂ emissions. – The region around our headquarters will be net zero. – Our venturing and innovation activities will contribute to net zero. 	<p>As a supplier or partner, work with us to reduce your emissions.¹⁰</p> <p>As a business in Waldeck Frankenberg (Germany), join our Mission Zero and become a member.¹¹</p> <p>As an entrepreneur, use our incubator WattX¹² to get your new solutions for net zero living spaces started.</p> <p>As a like-minded, family or medium-sized business¹³ become a member of our exchange platform Maschinenraum; to join forces on sustainability topics and accelerate your own net zero journey.</p>	<p>As a business, follow our example. Develop a plan to get your own region, corporate venturing, innovation activities and value chain to net zero.</p>

We invite you to join our movement, to challenge and improve our approach and with us accelerate the transformation towards net zero buildings.
We look forward to getting in contact: sustainability@viessmann.com

Glossary

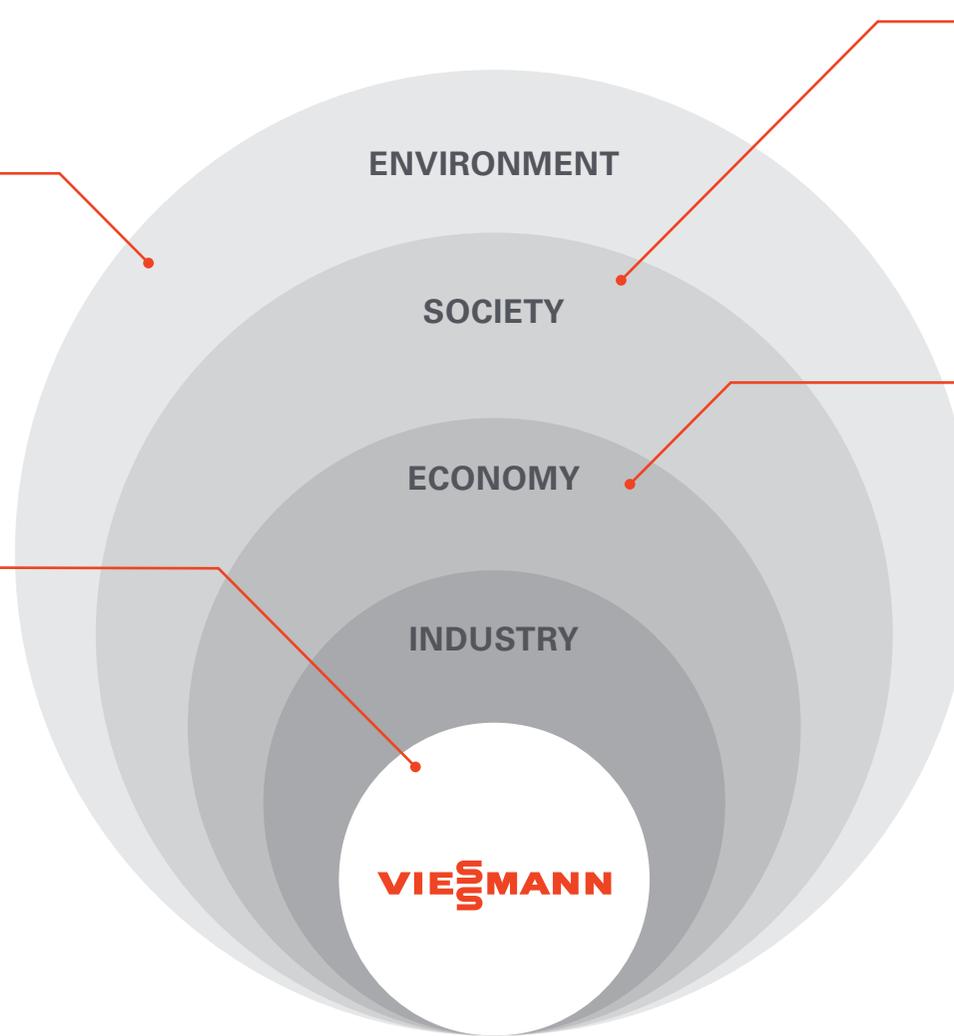
Please click on the words to view the definitions.

Environment

Carbon (Dioxide) budget
 Carbon footprint/ CO₂ footprint
 Circular
 Climate positive
 Climate neutral/ Carbon neutral
 COVID-19
 Greenhouse gas emissions (GHG)
 Green hydrogen
 Natural carbon cycle
 Net zero
 Regeneration
 Sequestered carbon

Viessmann

Climate-as-a-Service
 Climate solutions
 Etherma
 Etanomics
 LEAP
 Maschinenraum
 Mission Zero
 Power-as-a-Service
 Vitocal
 Vitocaldens
 Vitodens
 Vitosol
 Vitovolt
 WattX



Society

Doughnut model
 Energy community
 Energy district
 Energy transition
 EEFIG
 EU
 G7
 Paris Agreement
 Prosumers
 Renovation wave
 Systems transformation
 UN gABC
 UN Global Compact

Business & Industry

BDH
 Clean energy
 Decarbonisation
 Decentralisation
 Digitalisation
 Dematerialisation
 Economic intensity
 EHI
 EMAS
 Energy efficiency
 ENTSO-G
 European Clean Hydrogen Alliance
 Environmental Product Declarations (EPDs)
 Fossil fuel
 GDP
 Green electricity
 Greenfield installations
 Greenhouse gas protocol
 Green offering
 German National Hydrogen Council
 Hybridisation
 Industrial biomimicry
 ISO 14001
 Life Cycle Assessment (LCA)
 Resource efficiency
 Resource intensity
 Science Based Targets initiative (SBTi)
 Technical nutrients

BDH refers to the Federation of the German Heating Industry.

Carbon (Dioxide) budget, A carbon (dioxide) budget, emissions budget, emissions quota, or allowable emissions is an upper limit of total carbon dioxide (CO₂) emissions associated with remaining below a specific global average temperature.

Carbon footprint/CO₂ footprint is the impact of a product or process on global warming, expressed as CO₂ equivalent per a specified unit, i.e. per mass (kg), or volume (m³), or energy unit (kWh). The footprint encompasses direct and indirect emissions relating to that product or process, indirect emissions being "hidden" in the supply chain of materials or energy carriers, or in the end-of-life phase of a product in waste streams.

Circular refers to closed loop material flows where the output of one process is used as an input for another process - as we see in natural cycles. This is the opposite of a linear flow where materials are used in products and processes and then disposed of as waste.

Climate-as-a-Service refers to a Viessmann service for German customers, which optimizes the application of available subsidies for building renovation projects.

Climate positive means that activity goes beyond achieving net-zero carbon emissions to create an environmental benefit by removing additional carbon dioxide from the atmosphere

Climate neutral/carbon neutral refers to the idea of achieving net zero greenhouse gas emissions by balancing those emissions so they are equal (or less than) the emissions that get removed through the planet's natural absorption.

Climate solutions refer to heating, cooling, ventilation and refrigeration solutions offered by Viessmann for buildings.

Clean energy refers to solar, wind, hydro, bio and geothermal energy used to generate electricity and heat, as well as other energy carriers such as hydrogen or methane. Generally, clean energy is characterized by relying on renewable sources of energy, such as solar radiation.

COVID-19, known as coronavirus disease 2019, is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

Decarbonisation refers to the process by which electricity or heat are generated without the release of carbon dioxide, i.e. without using fuels which contain carbon.

Decentralisation refers to the process by which electricity and heat generation plants are more widespread and located with smaller capacities closer to our homes.

Digitalisation refers to the process of connecting and enabling control system information exchange from appliances and machines through information technology, such as computers.

Dematerialisation refers to the separation of a service from a specific set of hardware or machinery ownership.

Doughnut model refers to a concept which conceptualizes a sustainable state on Planet Earth for humanity. In a sustainable future, safe and just living spaces within the environmental limits and in concert with the social foundation are created. It was first conceptualised by British economist Kate Raworth.

Economic intensity characterizes the impact, i.e. CO₂ emissions, per unit of economic output, i.e. value added, gross profit, of an economic entity.

EHI refers to the European Heating Industry Association.

EMAS is the environmental management and auditing scheme of the European Union, which validates the environmental reporting and performance of organizations in the EU and awards conformity labels.

Energy community is a virtual community of electricity producers and consumers, which share excess generation and excess storage capacity to balance supply and demand among themselves. Energy community members can use their own generated solar electricity decoupled from the physical storage capacity of their home or e-vehicle.

Energy district is a local area- like a quarter, suburb, neighbourhood blocks- with a joint energy infrastructure and grids, like a combined heat and power (CHP/Co-Gen) generation unit, providing electricity and district heating at different scales. Future energy districts will also tap into heat recovery from wastewater streams and underground tunnels to enhance district heating systems with large heat pumps. Energy districts could also become owners of large-scale thermal storage units. Smaller scale districts would probably be equal to one street, larger scale districts probably equal to a medium-size city, which would be a quarter in a large city.

Energy efficiency is the ratio between the useful output and input of an energy conversion process.

Energy transition is a significant structural change in an energy system. Historically, there is a correlation between an increasing demand for energy and availability of different energy sources. The current transition to renewable energy, differs as it is largely driven by a recognition that global carbon emissions must be brought to zero. Since fossil fuels are the largest single source of carbon emissions, the quantity of fossil fuels that can be produced is limited by the COP21 Paris Agreement of 2015 to keep global warming below 1.5°C.

ENTSO-G refers to the European Network of Transmission System Operators for Gas.

EU stands for the European Union (EU) and is a political and economic union of 27 member states that are located primarily in Europe.

European Clean Hydrogen Alliance refers to a cross-sectoral group, which aims at an ambitious deployment of hydrogen technologies by 2030, bringing together renewable and low-carbon hydrogen production, demand in industry, mobility and other sectors, and hydrogen transmission and distribution.

Environmental Product Declarations (EPDs) refer to standardised information for products, which explain the impact of the product on the environment. These information sheets are developed according to harmonized rules specified in international standards.

Energy Efficiency Financial Institutions Group (EEFIG) was established in 2013 by the European Commission Directorate-General for Energy and the United Nations Environment Programme Finance Initiative (UNEP FI). EEFIG provides a significant contribution in accelerating private finance to energy efficiency. It addresses barriers

to energy efficiency financing through both policy design and market-based solutions to increase the scale of energy efficiency investments across Europe. Composed of over 300 representatives from more than 200 organisations, EEFIG's strength are its members- spanning public and private financial institutions, industry representatives and sector experts.

Etherma refers to a provider of direct electric heating solutions, which is part of the Viessmann solution portfolio.

Etanomics refers to a provider of energy consultancy and contracting services, which is part of the Viessmann group.

Fossil fuel refers to energy carriers of fossil origin, such as crude oil, natural gas, peat, lignite and coal.

G7 (The Group of Seven) is an inter-governmental political forum consisting of Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

GDP refers to gross domestic product, and is a monetary measure of the market value of all the final goods and services produced in a specific time period.

Green electricity is electricity produced with substantially lower greenhouse gas emissions than conventional fossil fuel power generation, such as solar photovoltaic electricity, electricity from wind turbines, electricity from geothermal energy.

Greenfield installations refer to factories or buildings, planned and constructed as new facilities – as opposed to brownfield installations which would renovate, extend, and upgrade existing facilities.

Greenhouse gas emissions (GHG) are gaseous emissions of Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbon Substances (HFCs), Polyfluorinated carbon substances (PFCs), Sulfur Hexafluoride (SF₆) and Nitrogen Trifluoride (NF₃). Those greenhouse gases are characterized by their ability to absorb heat radiation / long wavelength light, leading to temperature increases in the atmosphere. The main reference GHG is CO₂ – as it relates to the majority of GHG emissions in the atmosphere caused by humans. CO₂ has been established as the reference unit to characterize mixed emissions regarding the global warming potential in terms of CO₂-equivalents (CO₂e). In this report we sometimes state only “emissions” and in such cases always mean GHG emissions. We sometimes use CO₂ emissions and CO₂eq emissions to characterize climate impacts of our operations and products.

Greenhouse gas protocol provides accounting and reporting standards, sector guidance, calculation tools, and training for businesses and government. It establishes a comprehensive, global, standardized framework for measuring and managing emissions from private and public sector operations, value chains, products, cities, and policies. It was initially developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

Green offering is a product or service that has a better environmental performance than comparable products or services. A green offering can only be verified, if measurable and comparable indicators – such as the carbon footprint – are readily available.

German National Hydrogen Council referred to as the Nationaler Wasserstoffrat, NWR in German, was appointed by the German government and acts as an independent, non-partisan advisory board. The board consists of 25 high-ranking experts in the fields of economics, science and civil society. The German National Hydrogen Council's objective is to assist and advise the State Secretaries' Committee on Hydrogen in the further development and implementation of Germany's National Hydrogen Strategy [Nationale Wasserstoffstrategie, NWS].

Green hydrogen is hydrogen that is produced through electrolysis which is powered by renewable electricity – such as wind power or solar photovoltaic power.

Hybridisation refers to the combination of different technologies to achieve a higher efficiency and lower carbon emissions, i.e. the combination of a gas boiler with a heat pump.

Industrial biomimicry refers to the use of natural concepts and strategies in industrial contexts, i.e. the adaption of structures or cycles from nature in industrial processes to optimize efficiencies.

ISO 14001 is a series of international standards for environmental management systems.

Life Cycle Assessment (LCA) refers to an evaluation of environmental impacts of a product or service starting from the mining of raw materials, through production, use and end-of-life recycling or disposal. LCA follows international standards.

LEAP in this report refers to two things: (1) It refers to the four pillars of Viessmann's climate strategy: Lead, Empower, Advocate and Partner, in short LEAP. (2) Our climate strategy's title is "LEAP to Net Zero", and therefore, LEAP is also used in the very meaning of the word: with our climate strategy we strive to leapfrog, to take a grand step, towards net zero of our own operations and beyond.

Maschinenraum refers to the Viessmann subsidiary, providing an open peer-to-peer environment for cross-industrial collaboration and co-creation of sustainability solutions for the German Mittelstand and family-owned businesses.

Mission Zero is a non-profit association that aims to make the entire Waldeck-Frankenberg district and its more than 156,000 inhabitants climate neutral. It is located near Viessmann's headquarters in Allendorf.

Natural carbon cycle is the biogeochemical cycle by which carbon is exchanged among living organisms, soil and minerals, oceans and water bodies, and the atmosphere of the Earth. Carbon is the main component of biological compounds as well as a major component of many minerals. Along with the nitrogen cycle and the water cycle, the carbon cycle comprises a sequence of events that are key to make Earth capable of sustaining life. It describes the movement of carbon as it is recycled and reused throughout the biosphere, as well as long-term processes of carbon sequestration to and release from carbon sinks.

Net zero refers to a state in which the greenhouse gases going into the atmosphere are balanced by their removal out of the atmosphere.

Paris Agreement, often referred to as the Paris Accords or the Paris Climate Accords, is an international treaty on climate change, adopted in 2015. It covers climate change mitigation, adaptation, and finance. The Agreement was negotiated by 196 parties at the 2015 United Nations Climate Change Conference near Paris, France

Power-as-a-Service is a Viessmann service bringing together prosumers in an energy community that are passionate to increase self-consumption and be role models in renewable energy.

Prosumers is an artificial word characterizing a consumer who acts simultaneously as a producer of goods and services. In the context of energy systems, prosumers produce electricity or heat (i.e., through solar panels), and consume part of the energy for their own needs, whilst sharing or selling excess energy.

Regeneration refers to a state of balance where the impact of an activity on natural sources and sinks for materials and energy, is in equilibrium with the ability of those natural sources and sinks to sustain their capacities. Hence a regenerative building is using materials which can be fully recycled and would not pose a burden through creating wastes that would be unfit for use as secondary resources for new buildings. A regenerative building would rely on a regenerative power and energy system converting renewable solar, wind, bio and geothermal energy into usable building energies, such as heat and electricity.

Renovation wave refers to the required modernisation of existing buildings to improve the energy efficiency of the building, as well as to switch the supply of heat and electricity for the building to decarbonized society.

Resource efficiency is the ratio between the useful output and input of a resource conversion process.

Resource intensity expresses and compares the resource efficiency of different products and processes.

Science Based Targets initiative (SBTi) helps companies transition to a low-carbon economic profile by setting greenhouse gas emission reduction targets in line with climate science. Through Science Based Targets (SBTs), companies express their intention to reduce their greenhouse gas emissions to limit global warming to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C.

Systems transformation is a term inspired by the book “The great transformation” by Karl Polanyi, a Hungarian-American political economist in 1944. The system transformation today is used to characterize the fundamental changes required in the social, economic and cultural dimensions to enable a sustainable development for humanity. More specifically for the building sector, a system transformation entails climate neutrality of existing and new buildings, when it comes to materials used for construction and energy used for heating, cooling, ventilation, and appliances. The three enabling factors (3 D’s) characterizing the building sector system transformation are Decarbonization (of building materials, energy supply), Decentralization (of electricity and heat generation) and Digitalization (of controls which balance supply and demand for electricity and heat within the building and the community and interconnects the different grid infrastructures).

Sequestered carbon refers to carbon dioxide taken out of the atmosphere and converted into either mineral or biological forms of carbon.

Technical nutrients refer to raw materials and secondary raw materials used in industrial production processes.

UN GABC refers to the Global Alliance for Buildings and Construction, supported by the United Nations Environment Programme.

UN Global Compact provides a universal language for corporate responsibility and a framework to guide all businesses regardless of size, complexity or location. Joining the United Nations Global Compact means to take an important, public step to transform our world through principled business. Participation makes a statement about values, and it benefits both society and companies' long-term success. The compact's Ten Principles are derived from: the Universal Declaration of Human Rights, the International Labour Organization's Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the United Nations Convention Against Corruption.

Vitocal refers to the brand name of Viessmann heat pumps which come in many different configurations to suit the needs of different applications and heating system requirements.

Vitocaldens refers to the hybrid solution combining a Vitodens gas condensing boiler and a Vitocal heat pump.

Vitodens refers to the brand name of Viessmann gas condensing boilers, which come in many different configurations – the latest product generation is hydrogen and green gas ready, for operation with up to 20% hydrogen or 100% green gases. By 2025, the combustion based systems will be ready for 100% hydrogen combustion.

Vitosol refers to the solar thermal heating solution which offers thermal collectors, for direct use of sunlight for heat generation in building heating systems.

Vitovolt refers to the photovoltaic system solution offered by Viessmann, consisting of multi- and mono-crystalline silicon photovoltaic modules, for direct electricity generation from sunlight.

WattX is an incubator platform and subsidiary of Viessmann for the generation of ideas and innovative business models addressing complex challenges.

Detailed Timeline Explanation

Descriptions below explain in the timeline from page 9 in greater detail. The events in gray represent significant world events that relate to climate change. Those in orange represent major Viessmann events that demonstrate our leadership, innovation, and commitment to meeting the climate challenges of the day.

1917: First generation: Johann Viessmann develops and builds a new generation of steel boilers that deliver heat faster and consume less fuel.

1947: Second generation: Dr. Hans Viessmann takes over the company of 35 employees.

1957: New dual-fuel Triola boiler able to burn solid fuels or oil introduced

1965: First report on “Greenhouse Effect” is published.

1965: New Parola boiler able to burn oil or gas introduced

1973: Oil crisis

1970s: First systems to use renewable energies are developed: solar collectors, heat pumps and biomass fueled boilers.

1972: Viessmann launched world's first steel boiler. It was lighter, highly efficient for fuel and heat output, and easy to clean

1984: Introduction of Renox-System, which achieved lower nitric oxide emissions through cooling the burning flames.

1989: Introduction of the Paromat-Triplex model, the first boiler with three combined heating surfaces.

1990: First IPCC report finds the earth has warmed by 0.5°C compared to the pre-industrial time.

1991: Third generation: Prof. Dr. Martin Viessmann focuses on energy efficiency and international expansion.

1992: At the Rio Earth Summit the conviction for the need of a global policy response is affirmed and UNFCCC is established.

1997: The Kyoto Protocol sets greenhouse gases reduction targets for 34 major economies.

2006: The Efficiency Plus program increases the company's efficiency and replaces fossil fuels with renewable energy. As a result, Viessmann achieves the German government's energy targets for 2050 already in 2012.

2009/10: Viessmann is recognized as a sustainability leader and receives the German Sustainability Award and German Energy Efficiency Award.

2012: A new business area – Viessmann Cooling Systems – addresses the market trend of heating and cooling systems coming together, both technically and in terms of energy efficiency potential.

2014: To ensure the company's innovation capability, the Innovation Technology Center now bundles all activities.

2015: The Paris Agreement sets out a legally binding global framework for 196 countries to avoid climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.

2017: Fourth generation: Max Viessmann sets the course for the future.

2018: Greta Thunberg starts climate strikes and after 4 months, already more than 20,000 students around the world skip school to protest for climate action.

2018: Launch of new business models Power-as-a-Service and Heating-as-a-Service.

2020: The ViMove For Climate campaign is launched, driving citizen activism for reforestation. Launch of Maschinenraum innovation ecosystem

2021: The Earth has warmed to 1.2°C as compared to pre-industrial times. The sixth IPCC report states climate change is widespread, rapid, and intensifying. At COP26 in Glasgow, more ambitious emission reduction targets by 196 countries are expected to close the current gap and keep 1.5°C within reach.

2021: Products and systems can now be seamlessly connected via digital platforms. The LEAP to Net Zero climate strategy commits to investing €60 Mio over the next 10 years to set the course for a net zero future.

Footnotes

- ¹ European Commission. Joint Research Centre. Untapping Multiple Benefits: Hidden Values in Environmental and Building Policies. LU: Publications Office, 2020. <https://data.europa.eu/doi/10.2760/314081>.
- ² Global greenhouse gas emissions by sector, source: Climate Watch and World Resources Institute (2020), adopted after Hannah Ritchie (2020), Our World in Data, <https://ourworldindata.org/emissions-by-sector>
- ³ Viessmann has committed to SBTi's business pledge for 1.5°C, target validation by SBTi pending, <https://sciencebasedtargets.org/companies-taking-action#table>
- ⁴ Adopted after World Resources Institute and World Business Council for Sustainable Development, (2011), Corporate Value Chain (Scope 3) Standard, https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf
- ⁵ Assumed average renovation rate for the scenario analysis is increasing from 10% in 2020 to 95% in 2030, at 10% annual increments until 2027 and then 5% annual increments until 2030. The amount of heat pumps going into renovation will significantly increase over the next years, as replacing old gas condensing boilers like-for-like will get less and less attractive, with falling prices for heat pumps and more stringent CO₂ requirements. In order

to estimate the displaced carbon emissions through the renovation scenario, the displaced emissions are equal to the differential of the like-for-like replacement compared to the respective renovation path in year 1. To reflect the carbon lock-in effect of a like-for-like replacement, the avoided emissions are calculated based on the expected lifetime of the like-for-like of 20 years. Constant 2019 emission factors for natural gas (0.2294 kg CO₂e/kWh_{th}) and electricity (0.278 kg CO₂e/kWh_{el}) are taken as a basis (full lifecycle) and are used as a conservative assumption throughout the year 2030. Emission factors represent EU average, as the main markets are in the EU.

- ⁶ Keeping raw materials and embodied carbon in the loop; Explanation on the assumptions for the calculation: Example calculation for assuming a typical heat pump system for individual households like the Vitocal-200s (5kW) with indoor and outdoor unit, as well as warm water storage, ie. Vitocell 100E, with the following material composition: Heat pump (IDU + ODU): 135 kg steel, 20 kg insulation material / warm water storage tank: 80 kg steel, 19 kg insulation material. Embodied carbon potential (reference unit process data* from oekobaudat LCA database, available here <https://www.oekobaudat.de/en.html>)* Steel embodied carbon = 3.6 kg CO₂e / kg steel and *EPDM foam for boiler, water tank insulation embodied carbon = 256 kg CO₂e / kg EPDM foam

- ⁷ <https://vplus.viessmann.com/zusammen-in-die-zukunft>
- ⁸ <https://www.viessmann.family/en/how-we-co-create/our-responsibility/vimove>
- ⁹ Contact: support@vimoveforclimate.com
- ¹⁰ <https://etanomics.com/>
- ¹¹ <https://www.klimaneutrales-wfkb.de/>
- ¹² <https://wattx.io/>
- ¹³ <https://www.maschinenraum.io/>
- ¹⁴ A visualization of the Doughnut Model complemented with Viessmann's purpose. Explanation of the modell: <https://doughnuteconomics.org/tools-and-stories/11>

A photograph of a sunlit forest with tall trees and a path, overlaid with a solid red rectangular area on the right side. The text is located within this red area.

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