CLADE

Sustainability Report | 2023

Certified

This company meets high standards of social and environmental impact.

Corporation

Introduction

The events of 2023 have delivered an unequivocal message: our planet's climate is changing at an alarming rate, necessitating decisive, immediate action. The World Meteorological Organization's report that 2023 was the warmest year yet, with temperatures exceeding historical averages by staggering margins, serves as a resounding alarm.

As we witnessed the most extreme temperatures on record this past July, the world grappled with the resulting environmental devastations. In Canada, wildfires of an unprecedented scale scorched vast landscapes, while China endured flooding that impacted countless lives. Our oceans, too, signalled distress, with surface temperatures escalating to new highs and contributing to the intensity of storms. The dramatic reduction in Antarctic sea ice and the rise in sea levels stand as testaments to the relentless heat absorbed by our oceans.

Nationally, the United Kingdom's response to this crisis is under scrutiny. The UK's hesitant progress on climate objectives in 2023 is troubling. The gap between its actions and the required trajectory to meet emission targets is widening, reflecting a significant discrepancy that must be addressed. However, the UK has committed to continue schemes to foster public sector decarbonisation, which are commendable steps toward mitigating the carbon footprint of public infrastructure. Yet, it is imperative that these measures be expanded with urgency across the broader economy, with a focus on widespread adoption of heat pumps and the reform of fiscal and regulatory frameworks to support a low-carbon future.

As we progress towards a sustainable future, innovation in technologies such as Clade's natural refrigerant heat pumps will be vital. As will combining economic growth with sustainable practices—in a manner that embodies the essence of a forward-thinking capitalism. This report describes not only our past year's achievements but also charts a course for a future where commercial success is inextricably linked with environmental stewardship.

About Clade

Clade is the leading UK designer, manufacturer and installer of low carbon heating and refrigeration equipment at use natural refrigerants.

With 103 employees nationally Clade serve a broad range of customers from the HQ in Bristol and the Technology Centre in Leeds.

With year on year growth Clade is a flag bearer for the green economy. Combining commercial and ESG as a model for others to follow.

As a B Corp certified company sustainability is at the core of what Clade does each and every day. From waste reduction to optimising customers energy consumption and engaging with our local communities.

2023 Highlights

Nominated our charity of the year – Cancer Research UK

10 employees worked at St Gemma's Hospice Warehouse, in preparation for Christmas

Launched Spruce air handling units

Partnered with Plug Me In, to deliver a heat as a service option to customers

Lifecycle Assessment on our 100kW Acer

Received investment from Groupe Atlantic

Total of 352 trees planted with Carbon Footprint

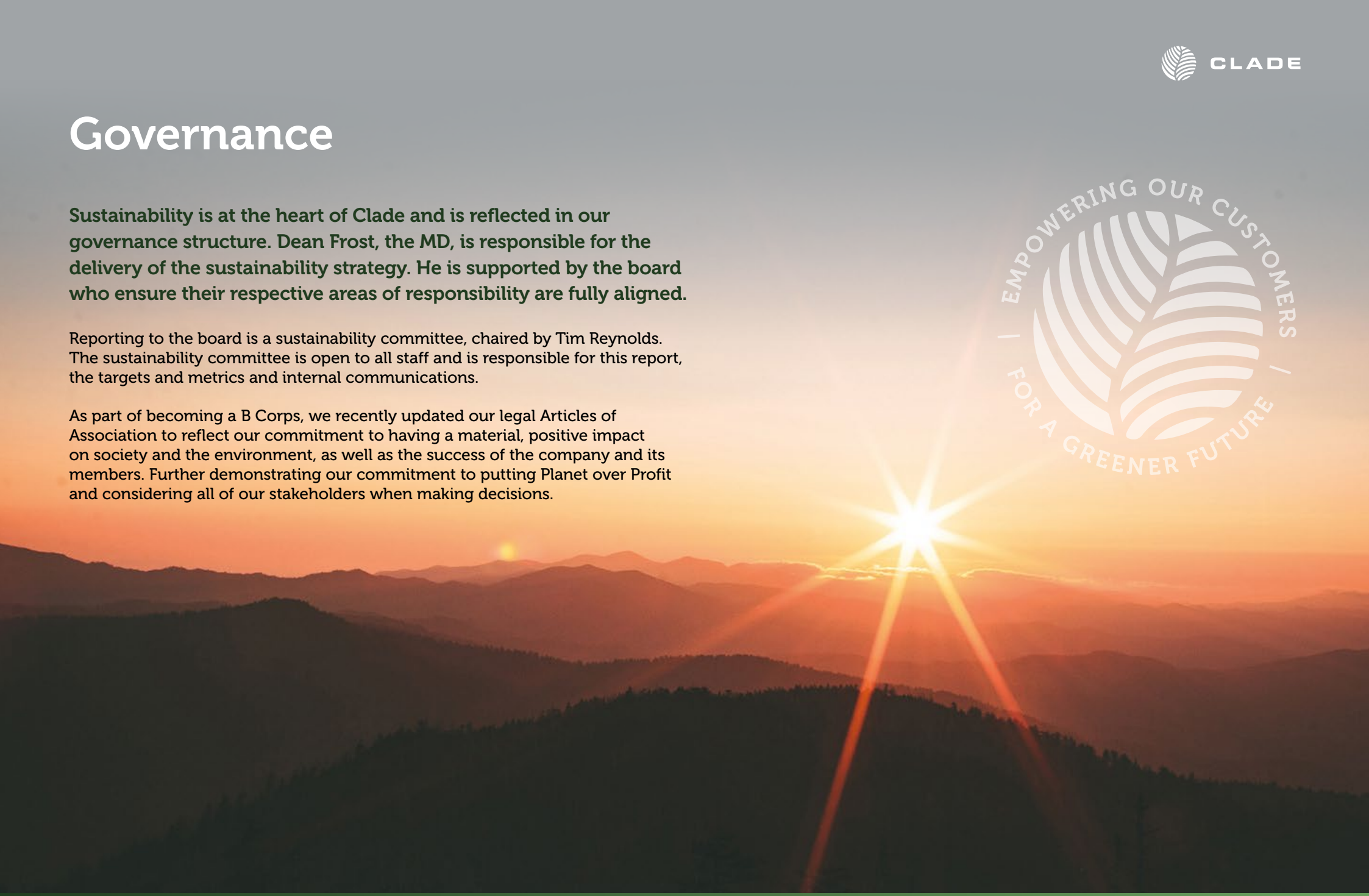
Achieved B Corps certification

Governance

Sustainability is at the heart of Clade and is reflected in our governance structure. Dean Frost, the MD, is responsible for the delivery of the sustainability strategy. He is supported by the board who ensure their respective areas of responsibility are fully aligned.

Reporting to the board is a sustainability committee, chaired by Tim Reynolds. The sustainability committee is open to all staff and is responsible for this report, the targets and metrics and internal communications.

As part of becoming a B Corps, we recently updated our legal Articles of Association to reflect our commitment to having a material, positive impact on society and the environment, as well as the success of the company and its members. Further demonstrating our commitment to putting Planet over Profit and considering all of our stakeholders when making decisions.



Market View

Globally heat pumps have emerged as the leading solution for heat decarbonisation. Their scalability and viability are now beyond question, as reflected in the growing market acceptance. Particularly notable this year is the surge in propane heat pump technologies, marking a significant trend in customer preference and technological evolution.

Governmental support remains a cornerstone for progress in this sector. The UK government's recent confirmation of continued funding for both the Public Sector Decarbonisation Scheme (PSDS) and the Low Carbon Skills Fund (LCSF) illustrates a stable backbone for the UK's commercial expansion in sustainable heat solutions.

Innovation in green finance and enhancements in grid flexibility have begun to make their mark on the market, with impacts that now ripple from domestic sectors to broader commercial arenas. Our strategic partnership with Plug-Me-In stands as a testament to this shift, demonstrating potential for substantial advancements in the integration of eco-friendly energy systems.

However, we must acknowledge certain delays in regulatory progression, particularly concerning new building standards and the DEFRA consultation on F-gas. These lags highlight areas where the UK's policy infrastructure must catch up with the European Union and the United States to maintain competitive momentum.

Private sector decarbonisation is poised for transformation, driven by a synergy of innovative financing, competitive power pricing, and escalating demand for action from consumers, NGOs, and shareholders alike.

The market outlook for natural refrigerants is robust, with projections aligning with an acceleration over the next few years. Confidence in natural refrigerant technology is reinforced by its potential for mass adoption, underpinned by customer demand. This momentum indicates a promising horizon for the Clade, as we anticipate UK market reinvigoration following the national election and continued export growth.

Social Impact & Values

(SDG 3, 5, 11)

In 2023, our engagement with local schools continued, Sarah Sayles (Head of People) also signed up as an Enterprise Advisor with Elliott Hudson Sixth Form College via West Yorkshire Combined Authority. This involved supporting events such as career fayres and workshops which included interviewing skills and CV writing to help young people transition from education to work. The role of an Enterprise Adviser is hugely important for providing support from the world of work by offering expertise and knowledge of the business world within a school environment.

We began the year by selecting a charity to support by asking employees to select a charity close to their heart and the majority opted for Cancer Research UK. Our intention was to organise some fundraising activities throughout the year but when having deeper conversations with our team, it was apparent that money was tight for many, so the focus shifted to giving our time within our local communities. This shift was a really positive step and was supported by our teams as not only were they giving back locally but spending quality time together outside of the work environment.

We sent a team to St Gemma's Hospice Retail Hub in Leeds where donations are sorted, labelled and distributed to the chain of St Gemma's stores or sold via online platforms. We saw sustainability first hand at its finest and were amazed by not only how full the Hub was but also the constant stream of donations that arrived during the day.

When attempting to source a foodbank to offer our time, we were advised that volunteering was on hold as food items were not getting as far as the central Hub. Donations were coming in so fast and going straight back out again and therefore, we set up some donation points and our team generously gave what they could. When delivering the items, volunteering was back on the agenda, so a team are signed up to offer support in 2024.

CLADE

"Working together for a greener and brighter future"

Sustainability

Our aim is to achieve a reduction in our own carbon emissions and climate impact whilst supporting our customers in their own ambitions to achieve Net Zero. We aim to be Net Zero in scope 1 and 2 emissions by 2050. We have also taken steps to identify a baseline for the carbon emissions involved in manufacturing a heat pump. Actions taken to date are:

- Rooftop solar PV supplying power to the Technology Centre.
- A large heat pump has been installed to heat the factory portion of the technology centre, set to replace the gas heating system.
- Increased the use of electric vehicles across the fleet – currently 56%.
- Funding the planting of trees for each product sold.
- Recycling all wood packaging via Leeds Wood Recycling.
- Our general waste is sent to a provider that operates zero waste to landfill.
- We only use natural refrigerants in products we design.
- We work with customers to reduce the carbon footprint of their buildings, beyond heating and cooling.
- Reduction of steel by removing frames from refrigeration packs & heat pumps.

In March 2023, the UK government released its 2030 Strategic Framework for International Climate and Nature Action. This included:

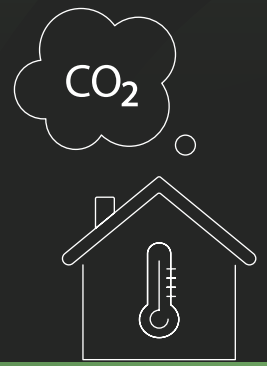
- Commitment to accelerating global sectoral decarbonisation. The Kigali HFC phasedown target is an 85% reduction by 2036, having already phased down 55%.

Clade heat pumps & refrigeration systems use no HFC refrigerant, contributing to this goal.

- Utilising UK expertise to foster international collaboration, knowledge sharing and research.

Clade heat pumps allow the use of less carbon intensive energy sources to produce heat.

The UK Government's Heat Pump Investment Roadmap states that the country intends to be one of the largest markets for heat pumps in Europe. The roadmap also states that heating is responsible for over a third of carbon emissions in the country.



Sustainability

Commitments & Targets (SDGs)

We have continued with the same Sustainable Development Goals (SDGs) that we identified as being relevant to us in 2021 and 2022. These are as follows:

- 3 Good health & wellbeing,
- 5 Gender equality,
- 7 Affordable & clean energy,
- 9 Industry, innovation and infrastructure,
- 11 Sustainable cities & communities,
- 12 Responsible consumption & production,
- 13 Climate action.

The following sections of the report entitled 'Our Impact' are categorised against these SDGs.

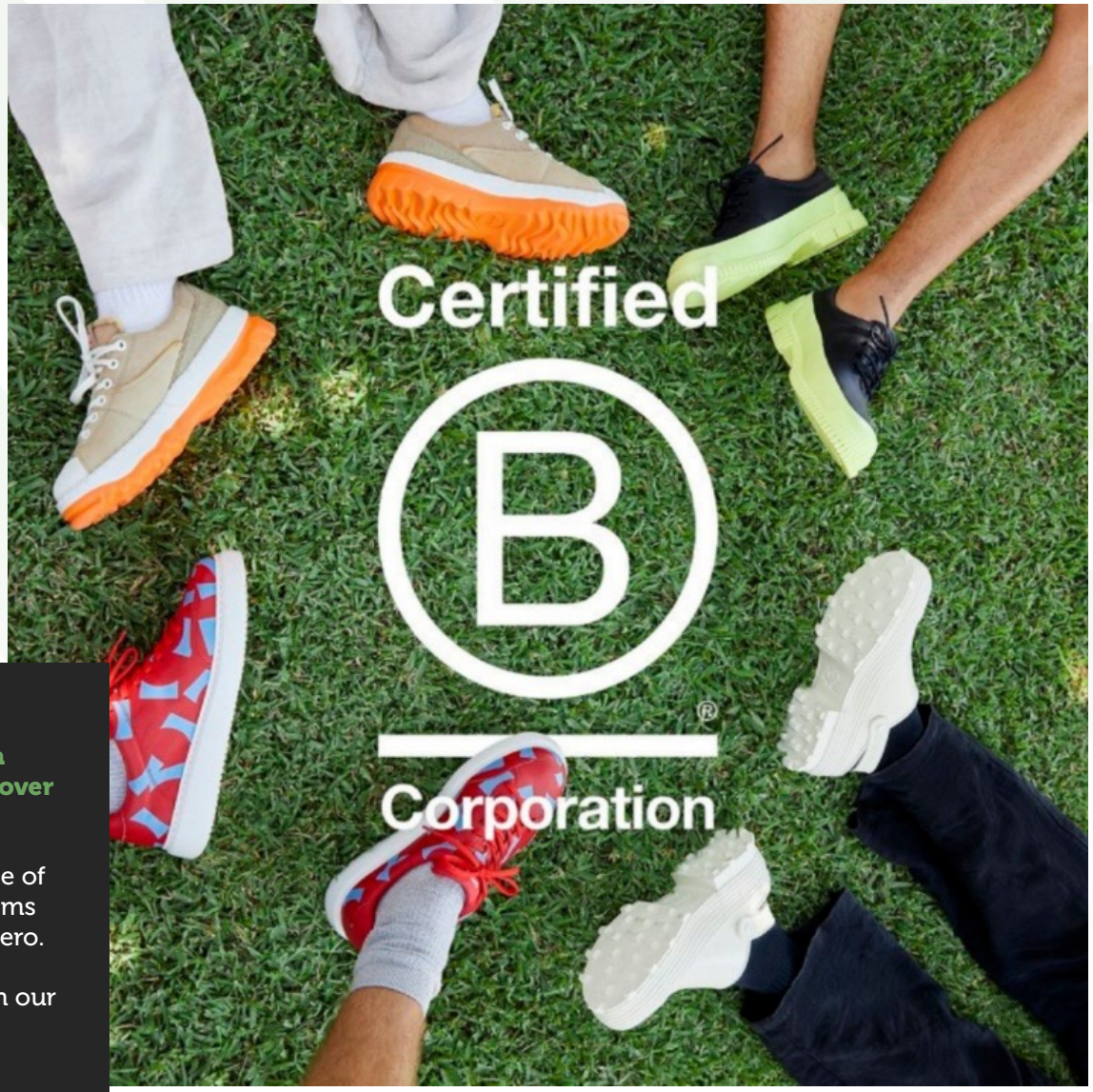
This report contains further information about our commitments and progress against these SDGs.

Future reports will build on this and may add or change reporting criteria as global sustainability reporting matures.

Our Impact – B Corps

There are only 1,500 B Corp accredited companies in the UK which means that we meet the **highest standards for high quality social and environmental business standards.**

We're officially a B Corp! Meaning that it's been certified that our business is a force for good.



We are thrilled to announce that Clade has now been certified as a B Corp organisation with a score of 86! It has been a lot of work – over the last three years – but we don't intend on stopping here!

1. Our continuously growing product range that champions the use of natural refrigerants and the displacement of gas in heating systems are front runners for UK manufacturing, paving the way to Net Zero.
2. We will continue to understand our own footprint and work with our supply chain to improve the industry's global emissions.

Our Impact – B Corps

What makes B Corps unique

Comprehensive Impact Analysis

The B Impact Assessment tool doesn't focus on one product of service but rather the business as a whole.

Mission Lock

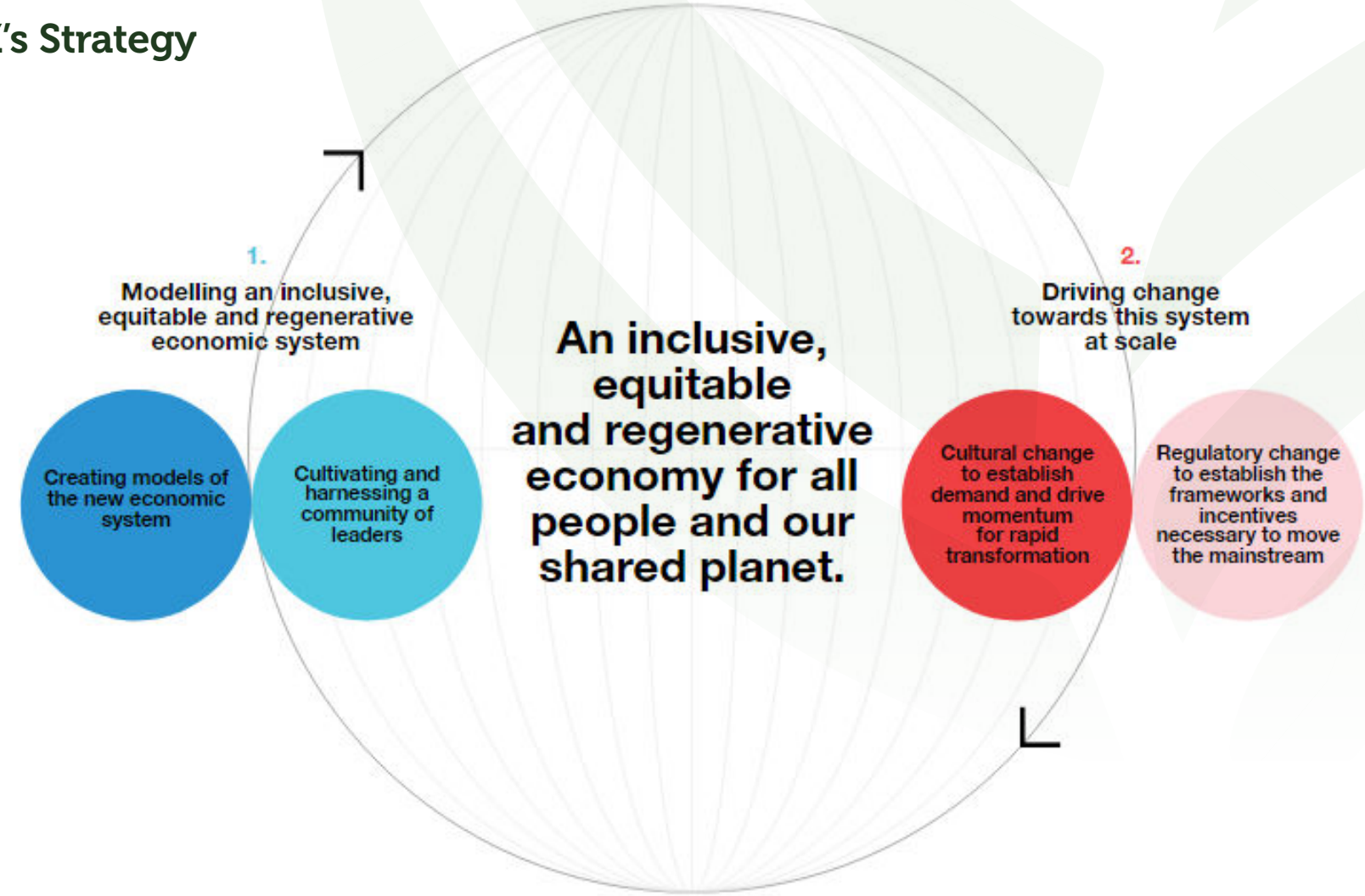
B Corps are legally required to consider the impact of our decisions on all their stakeholders

A Global Movement

B Corp is a global movement of businesses supporting each other to improve and drive global change

Our Impact – B Corps

B Lab UK's Strategy



Our Impact – B Corps

Following the challenging, detailed B Impact Assessment, we achieved 86 points out of a requirement of 80 and updated our Articles of Association to formalise our alignment with the B Corps movement's values, which embeds a stakeholder-focused mindset that separates B Corps from other businesses.

The results of our B Impact Assessment are below which demonstrates where we scored highest and lowest. The latter being something that we are committed to improving in the coming months and years:

Our Impact – High GWP Refrigerant Removal

What is GWP?

Global Warming Potential (GWP) is a measure of the relative global warming effects of different gases. It assigns a value to the amount of heat trapped by a certain mass of a gas relative to the amount of heat trapped by a similar mass of carbon dioxide over a specific period of time. Carbon dioxide was chosen by the Intergovernmental Panel on Climate Change (IPCC) as the reference gas and its GWP is taken as 1.

The leakage of refrigerant during the life of the product is inevitable through decommissioning or service and maintenance. Therefore, the use of high GWP refrigerants can be extremely harmful to the environment, **accounting for around 10% of global CO2 emissions** (according to the BBC).

Certified B Corporation

This company meets high standards of social and environmental impact.

Manufacturing

Everything that we manufacture – from Heat Pumps to Refrigeration systems - use natural refrigerants that have a GWP of 1 or 3, meaning that the impact of any leakage is significantly reduced compared to **widely used high GWP alternatives.**

Installation

During 2023, our Installation team removed 5,700 kgs of high GWP refrigerant – some of which had a GWP of nearly 4,000 Co2e per kg of refrigerant. All of this was replaced with significantly lower GWP, natural refrigerant alternatives.

The Point

As part of our commitment to the environment, we continue to champion the use of natural, low GWP refrigerants and actively work to influence the industry as a whole.

Our Impact – Customer Carbon Savings

(SDG 7, 12 & 13)

In 2023 we delivered products that are proposed to save nearly 800 tonnes of CO2 emissions per year. Below shows those savings for each of our heat pump products:

Unit	Refrigeration	Cost Savings (tonnes/year)
Acer	CO2	241.75
Oak	CO2	264.36
Aspen	Propane	114.81
Larch	Propane & Isobutane	171.75
Total		**792.67**

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The carbon savings have been calculated based on SCOP for each product, using average annual heat output for each product.

This is the equivalent of 189 petrol cars driven for one year, or 13,107 tree seedlings grown for 10 years

– based on EPA greenhouse gas equivalences calculator.

Our Impact – Supply Chain

We have spent time in 2023 engaging with our supply chain to better understand the origination of the items that we use in manufacturing with a particular focus on:

1 **Steel:**

The production of steel is energy intensive – it requires large amounts of water and the emissions produced from blast furnaces are particularly harmful to the environment.

We are in regular talks with some of our main suppliers about ways that we can innovate, improve and reduce the amount of steel needed in our products.

2 **Componentry:**

The origination of our componentry is of concern to us because of the impact a complex supply chain can have in terms of miles travelled to get to the destination.

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Our biggest supplier was able to provide the origination data for everything that we purchased in 2023 and below are the results:

UK 98.59%

Non-UK 1.41%

EU 99.98%

Non-EU 0.02%

This is out of **140,000 components** purchased in 2023.

Our Impact – Emissions Calculations (SDG 7, 12, 13)

Carbon Emissions

Scopes & Descriptions	2023 – Metric tonnes CO2e	2022 – Metric tonnes CO2e	2023 vs 2022	2021 – Metric tonnes CO2e	2022 vs 2021
Scope 1: Direct emissions from owned/controlled areas	0.72	0.85	-0.13	14.98	-14.13
***Scope 2:** Indirect emissions from the use of purchased electricity, steam, heating and cooling	37.50	56.66	-19.16	129.38	-72.72
****Scope 3 emissions**					
Employee commute (fixed place of work)	52.92	42.17	10.75	29.05	13.12
***Business travel (Engineers, Project Managers, Exec etc)	280.34	277.50	2.84	483.49	-205.99
Plant outbound deliveries	22.91	11.30	11.61	14.46	-3.16
Inbound deliveries	55.38	56.12	-0.74	0.00	56.12
Total Emissions	**449.77**	**444.59**	**5.17**	**671.36**	**-226.77**
*****Trees Planted**	**58.67**	**27.17**	**31.50**	**75.50**	**-48.33**
Net Emissions	**391.10**	**417.43**	**-26.33**	**595.86**	**-178.44**

*Includes an estimate for energy used by employees that work from home.

**These categories have been selected based on a level of materiality.

***This includes an estimate for subcontractors. It also includes an element of electricity mix supplied to the grid and any associated grid losses (relating to EVs).

**** This is an estimate based on 352 trees planted in 2023.

Our waste partner does not send any waste to landfill, and we have continued partnering with Leeds Wood Recycling who transform our waste wood into interesting furniture etc.

Post-Covid, we have continued to encourage home working (where feasible) to reduce the hours spent driving a car. Microsoft Teams meetings are always the default now too.

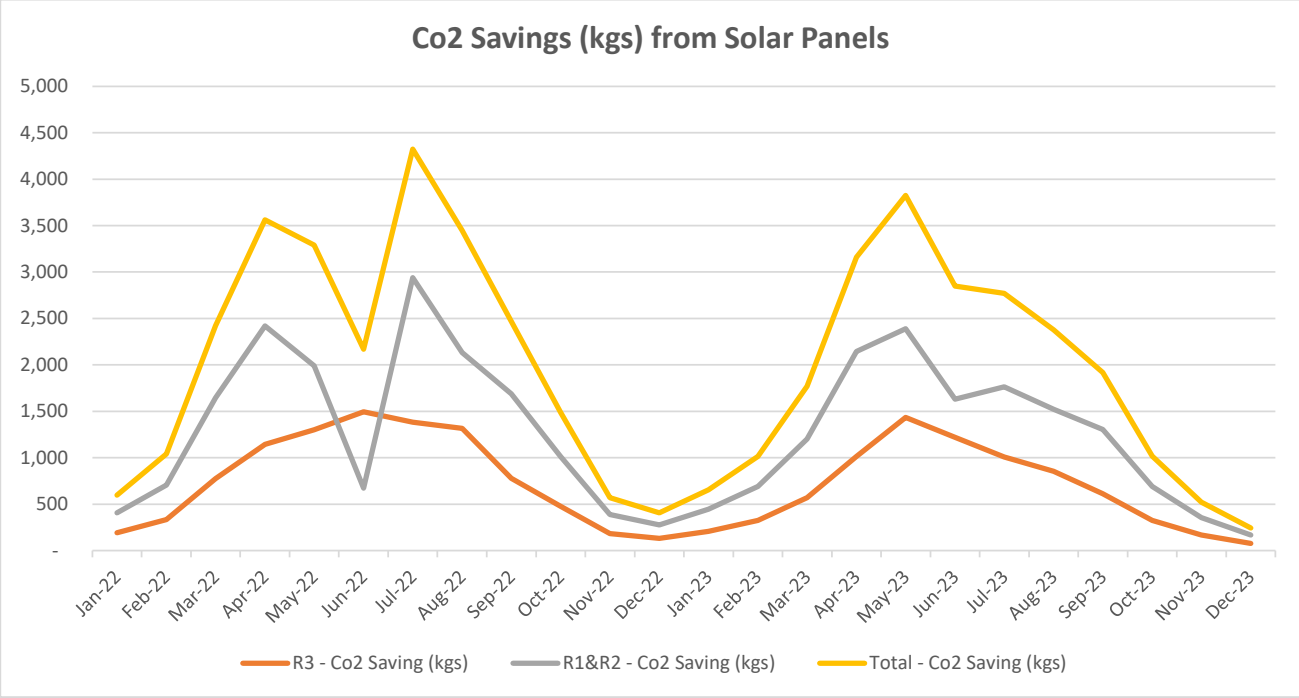
We have calculated the impact of miles travelled from the deliveries of our biggest supplier. The data for this was not available in 2021. We will continue working with them and the rest of our supply chain to make these deliveries as efficient as possible.

The overall reduction vs 2022 is predominantly a result of **planting more trees.**

Our Impact – Solar (SDG 7, 9, 13)

The solar panel array of 137 kWp on the roof of our Technology Centre in Leeds has continued to be an excellent CO2 saving for us throughout the year and we hope to install more.

The carbon saving of this installation is demonstrated in the following graph:

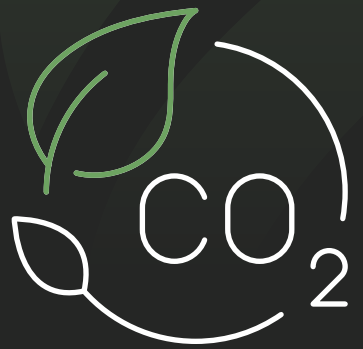


Since the installation in September 2021, we have

saved a total

52,458 kgs

of CO2



Our Impact – New Innovations

(SDG 7, 9, 12)

While our initial commitment involved more TM65 assessments, our Engineering resource has been allocated to the design and launch of our new heat pump range.

This strategic shift necessitated a temporary reallocation of Engineering efforts. Importantly, we want to assure our stakeholders that, despite this pause, we remain steadfast in our commitment to environmental impact assessments. These assessments will provide valuable insights into the lifecycle impact of our latest products, ensuring that we continue to meet and exceed environmental benchmarks.

As we transition away from the discontinued product range, we invite you to explore the details of our new products, where we will provide comprehensive insights into the advancements made, the efficiency gains achieved, and the positive environmental impacts resulting from our strategic product development.

Birch

The Birch serves as our flagship R290 propane heat pump, earning praise for its aesthetic appeal, and is also available in a low-noise version. It is offered in two models: the 85/50 and the 120/75, providing 85 and 120KW at +7°C ambient temperature, or 50 and 75KW at -5°C ambient.

Propane is more suited to retrofit projects, meaning that we can help to decarbonise a wider range of customer sites.

Maple/Rowan

Focusing on propane, the Maple and Rowan heat pumps will be retrofitted to existing buildings where their temperature profile suits it.

Our Impact – A Personal One (SDG 13)

Taking sustainability personally

At Clade, sustainability is not just something that we take responsibility for in our professional lives but also personally.

Our sustainability culture is built on individual passion for improving the world and protecting our environment for the future generations. We encourage all our team members to make conscious decisions to invest in sustainable options. We recognise that everyone will make a contribution in a different way and that any positive action is both valuable and far better than none. We have chosen to highlight one project this year and look forward to sharing more in the coming years.

As well as absorbing carbon from the atmosphere, trees are valuable for their biodiversity contribution, weather protection and produce, they are also vital for mental health. A mature Oak tree is home to over 2,000 other organisms from lichens to insects and birds. Trees cut the wind speed at low level and trap warm air keeping frosts at bay protecting the plants underneath. Trees produce fruit, nuts, timber, leaves (yes, you can each leaves and cows love them too!). They communicate using the fungal network in the soil called mycorrhizal.

Living near Exmoor National Park, our Chief Markets Officer and his family decided to create a new woodland and forest garden. This is a purely family project and doesn't receive any support from Clade, but it does reflect some of the cultural influences that shapes Clade's leadership.

On a few acres of steep hillside over 1,200 trees have already been planted with a further 1,200 being planted this year. The land has only been lightly grazed, not mown and is chemical free.

Over the past few years, wildlife is starting to establish in larger numbers with small mammals, owls, deer, foxes and birds of prey being seen frequently.

Positive Partnerships (SDG 3, 5, 11)

Groupe Atlantic

Clade successfully secured investment from Groupe Atlantic at the beginning of the year.

Together, with Groupe Atlantic's portfolio of commercial brands, Clade will benefit from Groupe Atlantic's experience as UK market leaders with in-depth knowledge of their customers and each stage of the building services supply chain. Groupe Atlantic's investment in Clade will ultimately expand both businesses' offerings and customer reach across the UK, not only in CO2 heat pump technology, but also with green energy solutions.

Carbon Footprint Ltd

Tree planting to reduce our carbon emissions with Wendy Buckley and the team at Carbon Footprint continued in 2023. We planted a total of 352 trees.

A tree can absorb as much as 21kgs of carbon dioxide per year and can sequester 907kgs of carbon dioxide by the time it reaches 40 years old. We plant trees in the Greater Leeds area so that we can give back to the local community.

Plug Me In

We recently partnered with Plug Me In and introduced "Heat as a Service" – a revolutionary approach to sustainable heating.

Say goodbye to upfront capital costs and hello to a greener future. For one single monthly payment Heat as a Service allows you to spread the investment cost over 15 years, guarantees system performance levels and includes a full-service package.

Leeds Wood Recycling

We have continued working with Leeds Wood Recycling. They are an ethical, cost effective and convenient social enterprise in West Yorkshire that diverts wood from going to landfill.

We were their first customer five years ago, and since then we've also supported them with Health and Safety consultation services. We have also worked collaboratively to help additional local charities by creating outdoor furniture from the waste wood that we have collected from our operations.

Future Ambitions and Summary

We have made significant progress over the last 12 months but recognise that there is much more to do. Therefore, we commit to the following activities and will continue to measure and report progress in subsequent reports.

MEETING THE CHALLENGE HEAD ON

#NETZEROBY2050

- To reach Net Zero by 2050,
- Evolve and develop our understanding/ reporting of our scope 3 carbon emissions. We plan to do this by working with our supply chain to better understand the footprint of the products that we manufacture,
- To prevent pollution, minimise waste and recycle, repurpose materials,
- To work to ISO 14001:2015,
- Transition to an all-electric fleet,
- Become paperless within the business and when issuing documents to customers,
- Minimising waste in our manufacturing processes by improving and developing the accuracy of all bill of materials',
- Continue to improve our B Corps score.

Future Ambitions and Summary

The events of 2023 serve as a compelling call to action for nations worldwide to reaffirm their commitment to climate action and to low carbon heat and hot water which is 40% of our carbon footprint.

Clade will deliver in the region of 16MW of natural refrigerant heat pump capacity to the market this year, an increase over the preceding years. This can be attributed to the success of our full service offering and engineering excellence, the rise of natural refrigerants for which Clade is a leading proponent and a slight increase in the general market largely driven by the public sector.

The outlook for the next few years depends on the outcome of the general election and the confidence in the business community. We have experienced several instances of private market buyers holding off on decisions due to the uncertain outlook. The continued commitment to public sector decarbonisation is welcome and will help build confidence in the technology as well as skills in the wider market. Skills development is fundamental to our success. Therefore, Clade will continue to provide training and advice to our customers, installers and consultants. We will be launching our Partner Program to acknowledge those who have the expertise to deliver successful projects using our heat pumps.

Next year Clade will bring new heat pump models to the market. We have already soft launched the Rowan, Maple and Birch heat pumps. The first units of these new models will be delivered to sites early in the year. We expect propane to be a significant part of our market in this coming year.

This past year has been both exciting and challenging for Clade and our teams. We have continued to grow our teams, product portfolio and service provisions as well as striking a major partnership with Plug Me In to finance heat pump installations, making it even easier for our customers to transition to low carbon heat.

Our commitment to sustainability continues and the achievement of B Corps certification is a huge highlight for us. Never has the need been greater for low carbon heating, nor has the opportunity to do good business in a sustainable way. We are excited about the next year!

CLADE

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