



Sustainability Report 2021



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Foreword

As a sixth generation family farm, we are dependent on the Earth. From conversations with parents and grandparents around the dinner table on climate and weather on the farm, we know that the climate is changing here and this is even before we turn on the TV and are bombarded with images of the impact of climate change around the world.

Things have to change. We have to change.

For Mash Direct, this is not a choice between commercial success and environmental sustainability. It is the soil, air and water in this corner of County Down that gives our vegetables their fantastic flavours and the current trajectory shows that we are facing a climate emergency.

As a family-owned business, we are able to take a genuinely long-term view on this rather than solely focusing on short-term profit. At the same time, we need to keep doing the simple things that we do well: keeping supply chains short and getting vegetables from our farm to your table in the shortest and most convenient way.

On top of doing the simple things well, we need to do better in many other ways. We need to become carbon neutral, reduce our water intensity and increase our biodiversity. This document will be the first of our annual Sustainability Reports to set out how we, at Mash Direct, will play our part in achieving these goals.

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Our expertise is in food and farming, not climate science. That is why we will have our targets and accreditations independently verified so that we can benchmark where we are now and where we need to get to. From this, we will learn from best practice, identifying those who have found new and more sustainable ways of growing and use these learnings to achieve even more ambitious targets in the years to come.

We believe that the future will be driven by consumer choice. With this in mind, we will wear our sustainability credentials on our packaging to provide full transparency of how we are performing against our environmental targets, good and bad. These credentials will be independently verified by Mondra and shown on the front of our packaging with the Foundation Earth traffic light system. Foundation Earth is an independent, non-profit organisation established to issue frontof-pack environmental scores on food products, enabling consumers to make more sustainable buying choices. They have brought together expert scientists and leading figures from food production and retail across the UK and EU (European Union) who all share a vision of a future food industry that reduces the negative impact on Planet Earth.

This isn't about saving the Earth – as David Attenborough's 'A Life on Our Planet' illustrated, the planet will rejuvenate and remain here long after we are gone. We need to work together to save ourselves from ourselves. This report sets out how we, at Mash Direct, will be a part of the change that needs to happen.

Martin, Tracy, Lance and Jack Hamilton Mash Direct

Welcome to the new Sustainability Report

This report is our starting position and will form the outline of future update reports on our Sustainability journey. At the end of every year, we will measure and review our performance against our targets, have these assessed independently, and set new targets for the following year.

These reports will show our current position, what we are doing well, what we aren't doing well, what we are doing to make sure we improve and our aims for the future.

As a first step, we will set out our Environmental Pledges, which are linked to United Nations (UN) Sustainable Development Goals and climate targets. As an Agri-Food business, we are directly connected to our environment and therefore one of the greatest risks is the developing climate crisis. As a result, it is not in our interest to make vague claims or to 'green wash', instead we are striving to make tangible change to become more sustainable with the hope that it will also push others to do the same. Where possible, our aims will reflect international guidance and advice, and will be independently accredited against these standards.

The science and the technology around reducing the impact on the climate is evolving rapidly. There may be areas here where we can make further improvements than predicted or new emerging technologies that we are not aware of that could play a crucial role in driving down our emissions, both of which we will adapt to. If you have any suggestions on where we can improve further, we would like to hear them. For these suggestions, please use the below email: sustainability@mashdirect.com

Adam Patton

Sustainability Manager, Mash Direct



Environmental **Mission Statement**

Our headline Environmental Mission Statement is for the factory and farm to be net zero by 2030 but this is not the whole picture. Below we have detailed the aims of all our environmental pledges which are in reference to the UN Sustainable Development Goals and local environmental aims. Each pledge will be further expanded on in its own section.



1. Carbon Neutral by 2030

Under the Paris Agreement, the EU is aiming to be carbon neutral by 2050. We believe that we need to act faster than this and pledge that we will be carbon neutral by 2030.



2. Absolute Emissions **Reduction 2030**

Simply offsetting our emissions is not enough. We will aim to half our emissions produced by 2030 in line with Science Based Targets.



3. Supply Chain Emissions **Reductions 2030**

We pledge, on top of pledges 1 and 2, that we will track and reduce our Scope 3 emissions throughout our supply chain

through use of our Environmentally Preferred Purchasing Policy and will work with suppliers to enable them to become more environmentally friendly.



4. Clean Water Pledge 2022

We pledge that we will work to prevent any reduction in local water quality as a result of farm run off, as well as remaining within all water consent levels as agreed with local authorities. UN Sustainable Development Goals 6.3 and 14.1.

5. Increase Water Use Efficiency 2023

We recognise that we are a high water user on-site. We therefore pledge to develop up to 70% water recycling to limit our demand on the local water table by 2030. To help with this, we will increase the rain water captured on-site. UN Sustainable Development Goal 6.4.



6. Zero Waste to Landfill and Incineration 2022

Mash Direct pledges to be a Zero Waste to Landfill and Incineration site as we aim to prevent methane emissions. We are currently Zero to Landfill, but we recognise that this includes use of Energy From Waste incineration, which we will eliminate. UN Sustainable Development Goal 12.4.



7. Waste Reduction 2030

We pledge by 2030 to substantially reduce the waste from the factory through prevention, reduction, recycling and reusing. UN Sustainable Development Goal 12.5.



8. Food Waste 2030

The business model of Mash Direct significantly reduces food waste. However we will strive to further reduce food losses in production and our supply chains by 50% by 2030. UN Sustainable Development Goal 12.3.



9. Recycled Plastic 2022

All plastic packaging purchased to include at least 30% recycled material and alternatives to be promoted.



10. Single Use Plastic 2030

We acknowledge that single use plastic is present in current shipping methods namely for wrapping pallets. We pledge to reduce this where possible and remove it and other single use plastics from the waste stream.



11. Reduce Food Poverty

To continue to reduce food poverty by donating excess stock and products that could go to waste to local food banks. UN Sustainable Development Goal 2.1.



14. Increase Biodiversity 2030

To improve biodiversity across the site through rewilding projects and soil sequestration. We will continue to rewild the land to form woodlands and wildflower meadows. Mash Direct will not contribute to any deforestation at our site or through our supply chain. UN Sustainable Development Goals 15.1 and 15.2.

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To promote and screen all suppliers on their environmental impact through use of our Environmentally Preferred Purchasing policy. UN Sustainable Development Goal 12.7



13. Sustainable Agriculture 2030

Mash Direct is committed to the protection of our land. We therefore pledge to continue to ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production. We do this to help maintain ecosystems, to strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other natural disasters, and to progressively improve land and soil quality. UN Sustainable Development Goal 2.4.



Introduction

At Mash Direct we firmly believe in the world's need to live more sustainably and a first step needs to be taken by all of us now. The extent and speed of the change will not be easy but without it we will have no fields to grow in and no water to produce with.

Since the industrial revolution, the world has emitted over 1.500.000.000.000 tonnes of CO2. This is still increasing and even 2020's global lockdown barely slowed this down - 31.5 Gt of CO2, higher than any year pre-2011.

The Paris Agreement says we need to limit a rise in temperature by 1.5 degrees Celsius versus preindustrial times by the turn of the century to prevent a global crisis. We are currently looking at 4.1 - 4.8 degrees Celsius in a worst-case scenario.

What is the issue?

Right now, we are facing a man-made disaster of global scale. Our greatest threat in thousands of years, climate change. If we don't take action, the collapse of our civilisations and the extinction of much of the natural world is on the horizon.

Sir David Attenborough

Global Greenhouse Gas Emissions and Warning Scenarios



Data source: Climate Action Tracker (based on national policies and pledges as of December 2019). OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the authors Hannah Ritchie & Max Rose

Figure 1 – Global Warming Scenarios

scenario if countries had not implemented climate reduction policies

> **Current Policies** 2.8-3.2°C emissions with current climate policies in place result in warming of 2.8 to 3.2°C by 2100.

Pledges & Targets 2.5-2.8°C - emissions if all countries delivered on reduction pledges result in warming of 2.5 to 2.8°C by 2100.

2.8°C Pathways

1.5°C Pathways

Currently the average CO2 in the atmosphere is at 417.14 ppm (March 2021). a 50% increase compared to the 1750-1800 average. The highest daily value of 421.21 ppm was on the 3rd April 2021. The last time it was at this level occured between 2.6 and 5.3 million years ago. To put that in perspective, humans didn't exist and there were trees in Antarctica. Back then, changes happened over tens of thousands of years but we have negatively impacted the atmosphere to this extent in just a few hundred years with the greatest emissions increase taking place in the past 50 years. Scientists have been warning the world for decades but, as shown by recent weather events, this is no longer what might happen, it has become what is happening. To limit the effects of climate change and the 6th mass extinction event, it is down to us as individuals and collectively to reduce our emissions and reduce waste.

We have seen the effects of climate change directly on our farm – three years ago we had to invest in irrigation equipment for the first time ever. Already this year we have seen one of the driest spells for this time of year and we may need to irrigate our fields earlier than ever before. We also experienced, for the

Annual Total CO2 Emissions, by World Region

		2	
35 billion t			
30 billion t			
25 billion t			
20 billion t			
15 billion t			
10 billion t			
5 billion t			
0 t			
1	990	1800	1850

Source: Our World in Data based on the Global Carbon Project. Note: 'Statitistical differences' included in the GCP dataset is not included here OurWorldinData.org/co2-and-other-greenhouse-gas-emissions CC B

first time, a wildfire starting on the edge of our land and we were devastated at the sight of wildfires in the Mourne Mountains which we could see from the factory in April 2021.

In order to measure success, the Paris Agreement has set out emissions targets and individual countries have pledged to become carbon neutral by 2050. The UN states that to keep global temperature rise below 1.5 degrees Celsius we now need to reduce global emissions by 7.6% annually over the next decade. This simply isn't happening right now.

The opportunity to prevent climate change has already past and the tipping point when it turns from mitigation to adaptation is coming up. The IPCC (Intergovernmental Panel on Climate Change) has agreed we have until 2030 to prevent irreversible change.

"The best time to plant a tree was 20 years ago. The second best time is now." - Chinese Proverb.

So far we have planted over 5,000 trees across our farm and factory and this number continues to grow.



This measures CO, emissions from fossil fuels and cement production only - land use change is not included

Figure 2 – Global Annual Total CO2 Emissions

What have we done so far?



From the Start...

One of the early successes of Mash Direct was to reduce food waste from the farm to the table. Martin Hamilton, the founder of the company and a fifth generation farmer, observed how customers were behaving around vegetables on the shelves in their supermarket. Vegetable consumption was in decline and food waste on the farm was rising as changing consumer behaviours meant that 'ugly' vegetables were being left behind on shelves for purely aesthetic reasons. This then meant that the shops were requesting only to be supplied with nice looking vegetables rather than selecting varieties for taste. Martin realised that by growing varieties for taste and then preparing them on the farm, he would create a much nicer dish as well as reducing food waste. Mash Direct was born and there was no more throwing out of 'ugly' veg to comply with beauty standards! As a result, we were able to use much more of the harvest as well as growing varieties for their taste rather than for their appearance. Furthermore, this had the added benefit of improving biodiversity on the farm as we didn't have to conform to narrow standards.

"2.2 GIGATONNES CO2 equivalent is the overall carbon footprint of farm stage food waste – approximately 4% of all anthropogenic greenhouse gas (GHG) emissions and 16% of agricultural emissions. This is equivalent to the emissions from 75% of all cars driven in the US and Europe over a year."

- WWF 'Driven to Waste' Report.

One of Mash Direct's greatest strengths is that there are virtually zero food miles from our farm to our factory. This is a unique position and we make full use of it. Due to the expansion of the company, we occasionally need to source from further afield but we are proud to support local farmers as much as possible. Currently over 70% of our vegetables come from less than 200 miles away from the factory with 60% coming from less than 50 miles.



The Farm

We have a significant number of sustainability practices in place on the farm already. Currently our crops are rotated to ensure the land and soil has time to recover between each harvest and we have a strong track record of developing rewilding areas of the farm. Reinstating hedgerows and replanting ancient woodland, such as our millennium wood project all play their part in increasing biodiversity across the farm.

Our farm has received Red Tractor Assurance, demonstrating our commitment to the highest standards of farming, environmental protection of our land and ensuring veg supplied to the factory is from a sustainable source.

On-site we have no heated greenhouses, all our food is grown as sustainably and as naturally as possible using techniques handed down across the generations.



Policies

We are committed to actively reducing our greenhouse emissions and voluntarily participate in the Government's Climate Change Agreements (CCAs). We consistently meet and exceed targets for carbon reduction through a range of energy efficiency measures.



Our Packaging

In 2019 we set ourselves a challenge to "Go More Green!" by changing to green and clear recyclable trays and removing over 240 tonnes of black plastic, which normally end up in landfill, from the food system annually.

All our food containers and cardboard sleeves are widely recycled, but as with most food packaging we do use plastic films, to reduce food waste, which is not commonly recycled despite being possible to. As a result, we are focused on reducing our consumption of all types of plastic and in particular plastic film, and currently sit on the Northern Ireland Food and Drink Association (NIFDA) Packaging Forum and are looking for solutions to the materials that are still difficult to recycle. All plastic purchased for use in our trays also contains at least 30% recycled content and we are seeking to increase this across all lines.

For our sleeves - our supplier utilises vegetable-based ink and low quantities of non-toxic glue, reducing the environmental impact of our packaging, and source reducing the amount of material required per an item supplied.



Our Suppliers

Since 2016 all of our products have Zero Palm Oil and will never contribute to deforestation, instead helping to fund initiatives to replant.

All cardboard purchased is FCS certified, meaning it is all obtained from a sustainable source.

Moving forward we have developed an **Environmental Preferred Purchasing Policy** which will help us to continue to improve our supply chain's impact on the environment.



Logistics

To further limit our supply chain emissions, Mash Direct has a No Air Freight Policy. Although the majority of our supply is local, we do export to the whole of the UK and countries abroad via road freight.



Our Waste

Currently we are a zero-landfill site and we have developed a company-wide recycling scheme to better capture all waste for recycling. All waste is compacted onsite to reduce millage and improve ease of collection.

We have reduced the amount of chemicals used on-site for cleaning through sustainable management. We also use non-toxic B Corp certified office cleaning supplies.

To reduce our demand on the water network we have developed direct water harvesting on-site from our roofs and collect from our farmland through the use of a borehole. We are aiming to further reduce the latter.



Our Energy Use

Through efficiency projects and culture changes we are reducing our energy intensity and subsequent carbon emissions per kg of end product produced. We will further drive down our demand and emissions through projects detailed in this report.

What could we do better?

There are areas of the business where we need to do better so that we can achieve our ambitious sustainability targets. Our annual sustainability reports will outline what we are doing well, as well as the areas where we believe that we can do better. Our ambition is to highlight where we need help so that we can work collaboratively with others to achieve our goals.

We are working to reduce our emissions not only in Scope 1 and 2 (which are those produced through controlled operations of the business, for example power used on-site or diesel emissions from our tractors) but also in Scope 3 (in our supply chain). We are the farm as well as the factory which gives us greater ability to reduce emissions from the field to the table. This is unlike other businesses which can push the supply chain emissions from farms into Scope 3, reducing their direct emissions but overall likely producing a higher impact on the environment . To be classed as carbon neutral, Scope 1 and 2 need to be eliminated or offset. However, we are not looking to 'greenwash', so we are accounting for all emissions and will push to reduce our Scope 3 emissions as well and encourage others to do the same.

Power

Our cookers and mashers use power which is supplied mainly through our grid connection. Due to the makeup of the grid in Northern Ireland, emissions are higher than competitors in the UK where wind and nuclear are bringing down emissions.

<u>Water</u>

We steam cook our vegetables to ensure that they retain as much of their nutritional value as possible. Between the steam cooking and the washing of the vegetables, we use quite a lot of water. As a result, we have the potential to create a high demand on the local water table in summer months as summer rainfall continues to decrease, even in the traditionally wet Northern Ireland. In the past, we have had a number of pollution events that have been attributed either directly to the company or via those who supply to us. Although these are outside the timeline of this report, it is important to acknowledge them here so that we can reflect on the lessons learned and ensure that there are no repeat occurrences.

We have had a number of challenges over the years in dealing with our wastewater. In 2011 a septic tank was damaged in construction and leaked. We have since implemented Construction Environmental Management Plans which are independently verified to ensure that there will be no reoccurrence of this.

In 2013, we had a serious incident when runoff from a supplier farm leached into the local river. This resulted in a fish kill in the river. We hired two environmental companies to restore the fish stocks to prior levels and introduced new policies with our key suppliers to ensure that this would never happen again. Since this date, works have been completed and additional policies have been put in place to prevent any further pollution events in this area and there have not been any repeat incidents of this nature since 2013.

We had a number of occasions in 2018 when our wastewater was outside of the consent levels set by the local water authority and this led to the company receiving a fine. Since this time, we have invested over £2.27m in our wastewater treatment to not only remove the chance of this happening now, but also to allow for future growth without the risk of recurrence. Since this point, we have received no non-conformances outside of the planned works notice despite a spike in volumes during the Covid-19 global pandemic. This demonstrates that the new system is robust and can cope with increased demand and high levels of volume.

So much machinery in the food manufacturing world is designed to pulp and over-process food and as a result, we set about designing and making bespoke machinery ourselves that would essentially scale up a kitchen at home and ensure the taste and texture of homemade food. Having designed our own processes, we struggled to find water experts who are independently accredited and experienced in working in plant-based food manufacturing sites. For example, the high level of starches that come from washing potatoes and leafy greens in particular have been a challenge. However, we strongly believe in home grown vegetables as well as home grown talent and we now have two full time members of staff who are experts in vegetables and waste water as well as three full-time staff trained in our wastewater treatment works. They work tirelessly to improve the sustainability of the site as a whole and our water footprint specifically.

<u>Gas</u>

Gas is a relatively clean energy source and is our main energy source on-site. This is due to the factory requiring large quantities of heat, to produce steam and heat cooking oil. Currently the method does result in lost heat and inefficiencies. The most evident of this is the large amount of steam lost to the atmosphere.

Our current emissions

On-site we are constantly expanding and as a result our emissions have been rising. To better understand our impact we have recently implemented an Environmental Management System and tracker which we started benchmarking from in January 2019. While our business model of sourcing our vegetables from our family farm or local farmers means that the food miles are low, by measuring our carbon footprint we have identified a large number of areas where we can improve.

It is our hope that through publishing this report of intent we will encourage others to do the same. Due to our continued growth our emissions have grown since our baseline year of 2019 and if we did nothing they would continue to grow at the assumed same rate before plateauing as shown below. The Well Below 2 degrees Celsius (WB2°C) and 1.5 degrees Celsius (1.5°C) Target lines have been calculated in reference to the Science Based Targets program. This focuses on Scope 1 and 2 emissions which we can directly control. Further targets of aiming to reduce Scope 3 emissions will be discussed in its own section.

Overall CO2 Prediction 6000 5000 4000 3000 002 2000 1000 ■ WB2^oC Target Half CO2 Total Do Nothina CO2 Prediction 1.5°C Target

Figure 3 - Scope 1 and 2 Mash Direct CO2 Emissions Prediction

Our CO2 prediction has been conducted to analyse the energy demand of each fuel source and how this has increased from the baseline year. As each demand has increased at different rates and each fuel produces varying levels of CO2 per kWh, we believe this is the most accurate method of predicting our emissions growth.

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Below is a further breakdown of CO2 produced by each fuel source per month. As explained, our greatest fuel source and therefore emissions source is Gas. However, when compared to other sources it has comparably low emissions per kWh. Our highest emissions per kWh used is Electricity, particularly the use





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of diesel generators as a backup onsite. Further breakdown of our emissions across all Scopes can be found below. As discussed, this will be higher than competitors for Scope 1 and 2 emissions as we include farm and factory. Also, due to the seasonal nature of farm activity, this results in large jumps in transport emissions, particularly during planting and harvesting. In the next section we will discuss our aims for reducing all emissions sources.

CO2 Breakdown

Figure 4 – Environmental Management CO2 Breakdown

Environmental Pledges

As previously mentioned, our headline Environmental Mission Statement is for the factory and farm to be net zero by 2030, but this is not the whole picture. In this section we have restated our Environmental Pledges which have been written into company policy, before further explaining each in our next section. Each pledge is linked to UN Sustainable any reduction in local water quality as a **Development Goals, scientific** advice or government targets and are aimed at promoting tangible change for both the factory and farm.



1. Carbon Neutral by 2030

Under the Paris Agreement, the EU is aiming to be carbon neutral by 2050. We believe that we need to act faster than this and pledge that we will be carbon neutral by 2030.



2. Absolute Emissions **Reduction 2030**

Simply offsetting our emissions is not enough. We will aim to half our emissions produced by 2030 in line with Science **Based Targets.**



3. Supply Chain Emissions Reductions 2030

We pledge, on top of pledges 1 and 2, that we will track and reduce our Scope 3 emissions throughout our supply chain through use of our Environmentally Preferred Purchasing Policy and will work with suppliers to enable them to become more environmentally friendly.

4. Clean Water Pledge 2022

We pledge that we will work to prevent result of farm run off, as well as remaining within all water consent levels as agreed with local authorities. UN Sustainable Development Goals 6.3 and 14.1.



5. Increase Water Use Efficiency 2023

We recognise that we are a high-water user on-site. We therefore pledge to develop up to 70% water recycling to limit our demand on the local water table by 2030. To help with this, we will increase the rain water captured on-site. UN Sustainable Development Goal 6.4.



6. Zero Waste To Landfill

and Incineration 2022 Mash Direct pledges to be a Zero Waste to Landfill and Incineration site as we aim to prevent methane emissions. We are currently Zero to Landfill, but we recognise that this includes use of Energy From Waste incineration, which we will eliminate. UN Sustainable Development Goal 12.4.



7. Waste Reduction 2030 We pledge by 2030 to substantially reduce the waste from the factory through prevention, reduction, recycling and reusing. UN Sustainable Development Goal 12.5.



8. Food Waste 2030 The business model of Mash Direct significantly reduces food waste. However we will strive to further reduce food losses in production and our supply chains by 50% by 2030. UN Sustainable Development Goal 12.3.



9. Recycled Plastic 2022 All plastic packaging purchased to include at least 30% recycled material and alternatives to be promoted.



10. Single Use Plastic 2030 We acknowledge that single use plastic is present in current shipping methods namely for wrapping pallets. We pledge to reduce this where possible and remove it and other single use plastics from the waste stream.



11. Reduce Food Poverty To continue to reduce food poverty by donating excess stock and products that could go to waste to local food banks. UN Sustainable Development Goal 2.1.



12. Supplier Management 2025 To promote and screen all suppliers on their environmental impact through use of our Environmentally Preferred Purchasing policy. UN Sustainable **Development Goal 12.7**



13. Sustainable Agriculture 2030 Mash Direct is committed to the protection of our land. We therefore pledge to continue to ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality. UN Sustainable Development Goal 2.4.



14. Increase Biodiversity 2030 To improve biodiversity across the site through rewilding projects and soil sequestration. Rewilding of land to form woodland and wildflower meadows to continue. Mash Direct will not contribute to any deforestation at our site or through our supply chain. UN Sustainable Development Goals 15.1 and 15.2

Reducing our emissions

To achieve these pledges, significant changes will need to be conducted by the business in all areas of our operations. In this section we will detail how we are going to improve moving forward towards each of the goals laid out.

Pledges 1 and 2: Carbon Neutral and Absolute Reduction by 2030.

Pledges 1 and 2 states that we will aim to be both carbon neutral and halve our absolute emissions by 2030. To achieve this, first we had to know our current energy usage, impact and any trends. We therefore have developed a new Environmental Management System (EMS) that has been back dated to 2019. Currently this system provides overall energy usage and emissions per month, however there are several flaws with the system due to this, such as limited information. To improve our energy tracking, we are developing a site-wide tracking system that will allow for live and more accurate measurement of the energy usage on-site. This system will assist us in identifying when and where there are potentials for energy savings in real time instead of overall usage a month later.

Becoming carbon neutral comes with several challenges. First we need to reduce our CO2 output per kg produced by making improvements on-site and then offsetting any residual emissions. Although this is not an unachievable goal, we will first focus on carbon reduction projects on-site. Simply offsetting or greenwashing is not a sustainable choice in the long term, we must first reduce our emissions at the source. This is why we have included the second pledge to reduce our absolute emissions by half by 2030.

For our on-site reduction we will be signing up to Science Based Targets for SMEs. Through this we are pledging to reduce our overall emissions inline with the Paris Accord 1.5 degree Celsius target, by at least 4.2% a year and will half our absolute emissions by 2030. This is a huge ask, especially as the company will continue to grow but we believe it is the right thing to do for us and the environment. Below is our current projection of how we aim to do this.

Power

Currently the majority of electricity onsite is sourced directly from the grid and is backed up with several generators which run due to the limited capacity of the connector. To reduce our emissions the generators will be phased out during factory expansion and will be replaced by improved grid connection and a range of renewable energy production sources across the site.

- 2021 Efficiency improvements -To assist in the reduction of power demand, efficiency improvements are to be investigated and developed. For example, in February the remainder of lights across the factory were converted to LEDs saving 82,246 kWhs per a year or over 27 tonnes of CO2.
- 2021 Live power tracking This will allow us to better plan and implement changes. - <u>Renewable energy</u> - Currently
- investigations are being conducted on the following renewable energy sources that would significantly reduce the grid requirement and therefore emissions for energy usage on-site.
- <u>2021 Heat capture</u> There is a significant potential for capturing the heat currently being lost to the atmosphere post cooking as steam is vented through our roofs. To do this, condenser units and heat exchangers are being investigated to allow us to pre heat the water entering our boiler and reduce the energy needed to bring it to boil. A further benefit is that this water has the potential to be fed back into our water tanks or be used for washing, reducing our demand on the water table.
- <u>2022 Solar Energy</u> We will install more solar panels on-site to reduce the energy load of our vegetable cold stores. This will reduce our dependency on mains electricity. – <u>2022 Solar thermal</u> – To be
- investigated for preheat and heat exchange to the boiler feed on top of previous heat capture. New and emerging combined solar technology to be included.

- 2022 Mains Electric Green Tariff -We will change our mains connection is recommended. to a green tariff, with the aim of reducing our Scope 2 emissions. Due to the current makeup of the grid in Northern Ireland, which is heavily reliant on coal, our electricity consumption results in higher emissions per a standard mains kWh compared the rest of the U.K. In a best case scenario, all of our electric will be sourced from renewable sources from 2022.
- 2022 Biogas This is the predicted date for our local Anaerobic Digestor being allowed to export biogas direct to the national grid. Once able, we will change our gas tariff to buy the equivalent of this gas from the grid reducing our emissions from our boilers further.
- 2023 Wind Energy Wind energy in Northern Ireland has significant potential but does have a more difficult route to installation with longer planning phases. To assist with planning, a feasibility study has been completed and a wind viability survey is due to be conducted and will give assurances on the impacts to the surrounding area. Due to the land close to the factory being part of the farm, a viable location is expected to be available but consideration will be given to neighbouring properties. Once complete, the Wind Turbine will be able to supply base load power to the plant reducing emissions. Further recommendation to use a refurbished turbine that would otherwise be decommissioned per reduced waste aims below. Wind power also has the potential to charge battery storage or potentially produce Hydrogen during low demand which can further offset power demand.
- 2024 Further expansion of Solar -Expansion of our solar system to cover all available roofs will further reduce our demand on the arid.

Transport

As shown, transport does contribute a considerable proportion of our CO2 emissions across a given year. To

reduce this, a move to low cardon fleet

- 2024 Electric Vehicles All office and sales vehicles that currently use white diesel to be converted to EVs by 2024. This will include sales cars and small vans, our first charge points have already been installed on-site. Recommendation to investigate the use of EV vans through a trial.
- 2030 Farm white diesel All farm vehicles currently using white diesel to be converted to EV.
- 2035 Farm Red diesel All farm vehicles using red diesel to be converted to low carbon sources. - Current policy of No Air Freight to
- be continued.

Cooking Efficiencies

In Figure 6, a considerable proportion of the residual emissions are from our use of Gas for cooking which will be particularly difficult to eliminate. However, as the factory is expanding, we are also developing our cooking techniques and investing in more energy efficient equipment, to further help reduce emissions across the site.

In the future, as we move towards the 2030 target, we predict that gas will be the largest source of our residual emissions, both by amount and per kWh. We therefore may need to further decarbonise our cooking methods by electrifying where possible and powering this through on-site renewable energy generation.

Prediction

As shown using past data and the increases of individual fuel sources, we can predict our "do-nothing" scenario where energy demand will continue to arow at the same rates before plateauing. When we include the roadmap outlined above, we can predict the effects of individual projects against this scenario and our overall energy demand for a given future year. From this we have used UK Government standards on emissions to determine our reductions in comparison to our pledges. Predictions shown on the next page.



Figure 5 – kWh prediction based on roadmap

CO2 Prediction



roadmap energy demand.



- Transport Bio fue Transport fuel Cooking Gas Generators Electric Measured Trash Transport Fuel Measured Farm Transport Fuel Measured Gas Measured Generators Measured Electric
 - WB 2.0 Target
 - 1.5 Target
 - Half CO2
 - Total Do Nothing

Carbon Capture

It is highly unlikely that the factory will be able to run fully off zero emissions resources in the foreseeable future, as previously shown, therefore steps will be taken to offset the carbon produced in the running of the plant. This is not included in the budget above but will be in reference to it.

- <u>Offsetting</u> Funding of carbon capture schemes across the globe to be included and budgeted for on the basis of the carbon prediction. 100% of residual emissions to be offset from 2025. We predict this will be 1,424 tonnes of CO2 in 2025 reducing to 529 tonnes by 2035.
- Insetting Carbon captured onsite. Due to the nature of the interconnection of farm and factory, carbon stored through normal operation and capture methods will also be included.
- <u>Agriculture Capture</u> Due to the nature of our business, during normal operations carbon is captured and returned to the soil through crop growth, known as carbon sequestration. Samples will be taken across our farm to determine the carbon stored per Ha. This will then be used to track changes in stored carbon and therefore be used to determine our carbon insetting moving forward.

- <u>Rewilding</u> Mash Direct already has a proud track record of replanting forest land, which will be further tracked and the CO2 inset will be included. Additional planting will also be continued to further increase our carbon capture. Promotion of hedgerows across the site also to be included.
- <u>WasteWater Sludge Carbon</u> <u>Capture</u> – Currently a project is being investigated to use the sludge produced by the wastewater treatment plant as a carbon capture device, the end product of which will be high quality and low impact fertiliser. Project to be in partnership with academia. If viable, this will further boost our insetting and reduce our predicted offsetting requirement.









<u>Pledge 3 - Supply Chain</u> **Emissions Reductions 2030**

So far, we have largely focused on Scope 1 and 2 emissions as these are the ones under our control and are the primary target of all emissions reduction goals. However, these are not the only emissions that we are ultimately responsible for, and we must therefore look to reduce the emissions generated in our supply chain both up and downstream. All Scope 3 emissions are currently being developed and will be added to the EMS for the purposes of tracking and reduction.

As our main supplier is the family farm, the emissions are already captured in Scopes 1 and 2. However some supply does come from further afield which we will aim to reduce and where we cannot, we will work with suppliers to reduce resulting emissions.

We do buy in large volumes of plastic which we will aim to reduce as per pledges 7 and 8. Downstream, our emissions come through the distribution of our products. As a result, we have implemented a No-Fly Policy to reduce emissions. We will continue to cut this through demanding sustainable practices by all distributors.

Through our water recycling project, we will also reduce 36 tonnes of water Scope 3 Emissions per year.

Increase in on-site renewable energy production will further reduce our Scope 3 electric transmission emissions.

Pledge 4 – Clean Water

UN Sustainable Development Goal 6.3 - By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

UN Sustainable Development Goal 14.1 -By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

As detailed previously in this report we have had issues with waste water from the site both in regards to unsuitably treated wastewater and run off. To combat this we have invested over £2.27m in our water treatment works to develop a state-of-the-art system that can automatically treat and analyse the water. All run off is also to be prevented by the creation and management of catchment areas. All water is and will continue to be treated to a quality comparable to our source water.

Pledge 5 – Water Efficiency 2022 UN Sustainable Development Goal 6.4 -

By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

Currently on-site the majority of our water comes from a borehole located in our farm. Although this is effectively a rainwater capture method we acknowledge that the amount of water we take from the local water table may become unsustainable as seasonal rain patterns become more disrupted. We are therefore improving our water efficiency as detailed below.

1. <u>Reduction</u> – Through our EMS system we are tracking the amount of water used and will incorporate all water meters into the new live tracker, which will provide us with up-to-date information that will allow us to better understand our water usage and reduce the amount required for operations.

- 2. Recycling As mentioned we currently are redeveloping our on-site water treatment works to improve our water quality. In phase two of these works we are aiming to implement a water recycling facility where 70% of the final effluent water can be retained on-site and repurposed for use across the factory and farm, significantly reducing our dependence on bore hole and mains water supply. The remaining water will be returned to treatment or through the sewer network.
- 3. Rain Water Capture Due to the size of the factory there is significant potential for rainwater capture. This can be used directly for nonproduction purposes such as wash water or can be treated and used as part of the whole factory supply further reducing demand. All new factory roofs will include rain water capture, including the extension currently being built.
- 4. <u>Steam Capture</u> Currently the steam generated on-site is lost to the environment resulting in wasted energy and water lost. To prevent this a heat exchange and condenser system is to be investigated. This will further reduce our emissions through reducing demand on the heating system and water usage as steam currently lost will be diverted to treatment for reuse.

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Pledge 6 - Zero Waste to Landfill or Incineration

UN Sustainable Development Goal 12.4 - By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.

We recognise that in food production it is impossible to have zero waste. As landfill waste is the most carbon intensive, it is one of our targets to reduce this. Currently our waste is taken from site by a thirdparty contractor for sorting and some of this waste does end up being used at an Energy From Waste (EFW) plant.

- <u>Recycling</u> - A new recycling system has been developed to divert waste from landfill and EFW which will be tracked to provide evidence of the on-site usage of different waste streams.

- To reduce carbon emissions our on-site biomass boiler has been decommissioned. This has had a knock-on effect resulting in higher waste volumes leaving our site for recycling.
- <u>To reduce carbon miles of our waste</u> - all streams leaving our site will be compacted. This includes our new dedicated cardboard compactor which has increased our collection of the waste stream and a new mixed recycling compactor which will collect all other waste for easier sorting and a reduction in EFW.
- Food waste Food waste that is suitable for human consumption is to be donated to food banks, for example cooked mashed potato with a packaging issue. While this is done to a degree, in some instances, food waste is present in other waste streams. As part of the new recycling system all food waste to be removed and separated to protect the recycling streams and to increase donations.
- <u>Reduction in waste</u> Any reduction from the site will have a knock-on effect to Scope 3 CO2 emissions.



Pledge 7 – Waste Reduction 2030

UN Sustainable Development Goal 12.5 - By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Where pledge 6 looks to increase recycling and prevent waste from ending up at a land fill site we must also focus on the reduction of overall waste and improve policies to limit wastage overall. Pledges 7 and 9 will feed into this reduction.

Waste to be reduced through supplier packaging engagement and factory efficiencies.

Pledge 8 – Food Waste 2030

UN Sustainable Development Goal 12.3 - By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including postharvest losses.

Currently on-site all of our peelings from the factory are used locally for animal feed. Recently we have developed a new tracking system which will weigh in all arrivals at the factory and can then be compared to the weight of final product to determine the level of food waste. Once established this can determine the lines with the greatest wastage and reduction measures can be implemented.

Pledge 9 – Recycled Plastic 2022

Currently the majority of our purchased plastic packaging, including all trays, contains at least 30% recycled content. We are therefore investigating methods to increase this including having bio drop-ins and alternatives to reduce our demand on virgin fossil fuel plastics.

Pledge 10 - Single Use Plastic 2030

Single use plastic is a significant issue with regards to waste across the globe and we contribute to this. Therefore we are investigating options to reduce plastics on-site.

- <u>Plastic wrap alternatives</u> Option to use alternative reusable pallet wraps for local deliveries as a first trial.
- Long haul pallet wrap We are currently investigating a transition to biodegradable alternatives. This will include an initial trial.

Due to the nature of the business and the desire to avoid food waste, packaging volume is a significant challenge in regards to plastics. we are source reducing plastics in our supply chain and investigating alternatives that can reduce our dependency.

Any reduction in unrecyclable single use plastic on-site will also reduce items sent to EFW plants and Scope 3 emissions.



Pledge 11 – Reduce Food Poverty

UN Sustainable Development Goal 2.1 -By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.

Although we cannot send our food across the globe to help all people end hunger, we can help those local to us. Currently, we do donate to local food banks and will increase this through better capture of lost product and excess stock.

As part of our commitment to reduce food poverty, we have partnered with charity partner FareShare to tackle food poverty in Northern Ireland. We have donated more than 190,000 meals to disadvantaged people via our partnership with FareShare. The climate crisis can't just be addressed by adding cost to our products to service only those who can afford to pay more for







their food. We supply to supermarkets that cater to every section of our society and it is our belief that environmental benefits will only be realised if they are achieved through making vegetables affordable and convenient. This is the only way that we can make sustainability scalable from our family farm.

<u>Pledge 12 – Supplier</u> Management 2025

UN Sustainable Development Goal 12.7 - Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

A significant factor in the sustainability of Mash Direct is rolling out good practice to our supply base. We are therefore currently reviewing our supplier engagement policies. This will include the requirement of sustainable reporting for all suppliers to allow us to create and prioritise a "green suppliers" list. Although this will have a knock-on effect to our Scope 3 emissions, the main priority is to encourage our suppliers to reduce their own emissions and help us purchase only from companies that uphold our same commitments to the environment.

Pledge 13 – Sustainable **Agriculture 2030**

UN Sustainable Development Goal 2.4 - By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Currently our farm has a proud history of looking after the land we manage due to the philosophy of 'if we look after the land, the land will look after us'. However, we are always looking for ways to improve and as discussed, we have experienced new challenges on the farm as the climate changes. We will therefore take a more scientific approach and measure the soil quality of the farmland. We will then be better equipped to determine better ways to improve our land.

Pledge 14 - Increase **Biodiversity 2030**

UN Sustainability Goal 15.1 - By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

UN Sustainability Goal 15.2 - By 2020. promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

This is largely linked with Pledge 13 as without one the other will fail. To improve biodiversity on-site we have implemented several rewilding and planting schemes. This includes the creation of new woodland and wildflower meadows and cover crops are also used to encourage biodiversity and improve soil health. To assist with the benchmarking we have conducted a site wide bird survey and are currently conducting bat and migratory specific surveys. So far this has shown a wide range of bird and bat activity across the farm which will be factored into any decisions regarding site development and renewable power generation.

Furthermore we will continue our work with RSPB and improving bird and butterfly habitats across the site. We will track this progress and quantify the improved biodiversity on-site with the aim of significantly increasing by 2030. We also recognise that biodiversity is a global issue and will not purchase any material that contributes to deforestation or the degradation of biodiversity. This includes Palm Oil which we have been free from since 2016 and will rather fund initiatives to replant and replenish biodiversity depleted ecosystems across the globe.

Further Environmental Considerations

In addition to the pledges detailed above we are also implementing additional and continuing company policies that will have knock on effects to the pledges given.

- Switch Off Lighting A lot of the factory currently has occupancy sensors for lighting but where this is not possible all lights are to be turned off when the area is not in use.
- No Stand-by All equipment to be turned off at the end of each day to reduce "vampire" loads.
- No Idling Across our site we use a range of vehicles and forklifts. To reduce emissions and fuel usage all vehicles are to be turned off when not in use. - Virtual Meetings - This transition
- has become come easier due to the Covid-19 pandemic and will continue to be encouraged to reduce travel.



- Car sharing or sustainable transport -Car pooling to be encouraged when possible to reduce emissions by staff. Alternative modes of transport such as cycling will also be encouraged.
- Paper Usage Printing to be reduced through better use of interactive information boards.
- Refill Currently all new staff are given a reusable water bottle but usage has been low. To encourage this, refilling stations will be expanded to all communal areas.
- Sustainable freight No air freight to be continued and sustainable practices such as low carbon transport to be encouraged.

Further UN Sustainable Development Goal Targets:

UN Sustainable Development Goal 3: Ensure healthy lives and promote well-being for all at all ages

We have a commitment to producing healthy, affordable vegetable dishes as well as encouraging others in the food industry to improve on their health credentials. Mash Direct was one of the first companies in Northern Ireland to pilot the 'traffic light system' of putting the nutritional information on the front of the pack to make it easy and transparent for consumers to see and we have continued to drive innovation in this area.

Peas Please – The Food Foundation

To achieve this at a national level, Jack is on the Strategy Board of Peas Please. The purpose of this group is to secure commitments from industry and government to improve the availability, acceptability (including convenience), affordability, and quality of the vegetable offer in shops, schools, restaurants and beyond, and in turn stimulate increased vegetable consumption among the UK public, particularly children and those on a low income.

Peas Please is a ground-breaking new initiative focused specifically on veg. Our consumption levels are declining. Peas Please aims to bring together farmers, retailers, and restaurant chains, caterers, processors and government departments with a common goal of making it easier for everyone to eat veg.

Our diets are leading to high levels obesity, type 2 diabetes and other diet-related disease and we need to eat more veg. The project explores the

levers along the supply chain which have the potential to increase vegetable consumption in a sustainable manner. Peas Please recognises that, to date, education programmes have not had the desired impact. So this project focuses on the wealth of opportunities there are, in the supply chain, for improving vegetable intake.

Mash Direct's current pledge to Peas Please is: "Mash Direct pledge to increase consumption of veg through a large scale Grow your Own campaign to encourage people to try to grow their own veg at home. This will be promoted widely to consumers, schools and retailers, on pack and through outdoor advertising and on social media. Mash Direct will give away approx. 300 Grow your Own kits. Mash Direct will continue to supply FareShare with all excess vea."

Throughout 2020 we held several campaigns which promoted health and well-being, as well as helping local sports teams and communities get back on their feet as a result of the Covid-19 pandemic. Please see below some information on the campaigns that we held in 2020:

Feed the Nation

Towards the beginning of 2020, as a direct result of Covid-19, Mash Direct initiated a campaign to help job seekers to find work by launching 'Feed the Nation NI' (www. feedthenationni.com) an employment match making service in Northern Ireland. The campaign aimed to ensure that there was no disruption in supply so as supermarkets were able to remain stocked and the NHS could be supplied with food whilst the United Kingdom saw an unparalleled rise in demand.

Mash Direct started the campaian to help job seekers in Northern Ireland to find work by launching Feed the Nation NI. The initiative started out as a conversation between local food producers, we knew we needed to act fast, therefore we came up with the idea to build a platform where jobs could be posted by employers and CVs could be posted by job seekers.

The Feed the Nation initiative included the creation of 30 temporary positions at Mash Direct to help members of the local community who were out of work as a result of the pandemic.

Feed the Heroes

As a response to Covid-19, Mash Direct initiated the 'Feed the Heroes' Campaign. Mash Direct launched the 'Feed the Heroes' Campaign in March 2020, delivering over 3,300 packs of Mash Direct products to NHS workers in Northern Ireland. Mash Direct worked with the Health and Social Care Trusts in Northern Ireland, and Hospital Groups in Ireland to get the boxes delivered into hospitals and distributed amongst staff who work vigorously to combat Covid-19.

Dine In to Dine Out

After the Feed the Heroes Campaign, Mash Direct then sought to support the local hospitality industry by giving out vouchers for local restaurants on pack. This helped to advertise Northern Irish restaurants that were suffering as well as ensuring that people would be able to go out to enjoy a meal whenever they reopened. Co-incidentally it preceded the Chancellors' own Eat Out to Help Out Scheme by only a few weeks!

At the same time, we pressed pause on social media advertising on Facebook and Instagram due to the lack of action the platforms were taking on hate

We supported 21 local restaurants across Northern Ireland by providing £3,000 worth of restaurant vouchers.

Mash Direct Champ-ionships

Mash Direct launched a sports campaign 'The Mash Direct Champ-ionships' in July 2020. Covid-19 has seen the temporary closure of many sports teams and prevented people enjoying certain fitness activities. Mash Direct also reached out to the sports councils and national governing bodies to help with the promotion of this campaian. This campaign gave teams across the country the opportunity to win the top prize of a £5,000 sponsorship package which included a Mash Direct branded playing kit for the forthcoming season. Runner-up prizes included a training session with a coach or PT of their choice and supported teams across the UK and Ireland.

speech. This meant that funds that would have been paid to big social media platforms were instead reallocated to support the local community.







Interim targets for 2021

This year, we have taken several steps to achieve our goal of reducing our emissions and impact on the environment. We will continue to develop our understanding of this and bring in additional measures.

- <u>LED Lighting Upgrade</u> Completed February 2021, converting the remainder of our lights to energy efficient LEDs saving an expected, 82,246 kWhs per year or over 27 tonnes of CO2.
- <u>Company Grove</u> Our first major rewilding project was completed in April 2021, converting a field into a new company woodland.
- Water Treatment Upgrade Work has started on our water treatment upgrade project and is on track to improve the efficiency of how our water is treated. Due to be completed Summer 2021.
- <u>Power Tracking</u> By the end of the 2021 we aim to have a site-wide power tracking system implemented giving us up to date information on our consumption of all resources.
- <u>Steam Capture</u> Aim to have our steam capture system designed and installed by Winter 2021.

- Solar 2022 NIE application to be submitted and site prepared for installation of first solar system in Spring 2022.
- <u>Wind Power</u> Planning preparation completed and submitted to push for an installation date of 2023.
- Rain Water Capture To be installed on extension currently being built.
- Offset 20% of Residual Emissions to reduce our impact but ensure funds are available for other projects.
- <u>Compactors Upgraded</u> to reduce our waste collections impact.
- Carbon Capture begin a project to investigate methods of carbon capture, with an aim to provide a full feasibility study.
- Daylight Sensors to be installed throughout farm and production available areas to reduce lighting demand further.
- Soil Sequestration Baseline to be set up for later years.
- New Supplier Policies to be implemented to ensure environmental performance.
- Reduce Emissions compared to 'do nothing' prediction.

How Will We Measure Our Progress?

- 1. We will publish our Sustainability Report annually to track where we are making progress as well as where we need to make further improvements.
- 2. We will then have our information independently assessed by Mondra to ensure that we are measuring accurately.
- 3. We will then put our independently verified 'eco-scores' from Foundation Earth on the front of our packs so that consumers can make more informed decisions about the food that they are eatina. This will ensure that there is provenance and transparency in the food system, driving positive change not only at Mash Direct but also, we hope, with others.

Foundation Earth is an independent, non-profit organisation established to issue front-of-pack environmental scores on food products, enabling consumers to make more sustainable buying choices. We have brought together expert scientists and leading figures from food production and retail across the UK and EU who all share a vision of a future food industry that doesn't destroy Planet Earth.

Foundation Earth has also brought together the world's two leading systems for measuring the environmental impact of an individual food product and communicating the information clearly and simply to consumers via a frontof-pack score. Its aim is to promote more sustainable buying choices from consumers and more environmentallyfriendly innovation from food producers, who will be determined to secure a better score.

The Foundation's pilot launch in Autumn 2021 will use a traffic-light style system developed by Mondra, using data from the academic paper Poore & Nemecek (2018).

The pilot will run in parallel to an intensive nine-month development programme, supported by Nestlé, that will combine the 'Mondra' method with a system devised by an EU-funded EIT Food consortium of Belgium's Leuven University and Spanish research agency AZTI.

The Mondra and EIT Food systems are unique alobally, in they both allow two products of the same type to be compared on their individual merits via a complete product life cycle analysis, as opposed to simply using secondary data to estimate the environmental impact of an entire product group. This method of individual assessment using primary data is crucial to encourage sustainable innovation in the international food supply chain.

The Foundation Earth R&D programme will produce an optimum and automated system for use across the UK and EU bv 2022.





Product Grading Summary

(front of pack)

The following grades should be represented on the front of pack single score

Product Name	Overc
Mashed Potatoes	Q
Champ	Q
Carrots & Parsnips	(
Mashed Turnip	Q
Colcannon	(

Product Grading Summary (back of pack)

The following impacts and grades should be represented on the back of labelling example shown to the right. Online record URL can be found in the Product Impacts - Detailed Results for each prodct.

(Please note for the purpose of labelling, all numbers are rounded to 2 significant figure)

	Carbon (g CO2 eq)			Water Use (L.eq)			Water Pollution (g PO ₄ ³⁻ eq)			Bio-diversity (Species loss index)		
Product Name	per 100g	per serve	Grade	per 100g	per serve	Grade	per 100g	per serve	Grade	per 100g	per serve	Grade
Mashed Potatoes	180	370	А	53	110	С	0.46	0.92	В	0.0061	0.012	А
Champ	190	390	А	61	120	В	0.51	1.01	А	0.0074	0.015	А
Carrots & Parsnips	160	330	Α	22	44	А	0.29	0.59	Α	0.0039	0.0078	А
Mashed Turnip	160	330	А	17	34	A+	0.29	0.58	Α	0.0039	0.0077	A+
Colcannon	220	440	А	70	140	С	0.57	1.1	В	0.011	0.023	А



General Commentary

The supply chains are simple and short in general, enhancing the reduction of impacts from transportation.

Biodiversity impacts are low across all products owing to the low incumbent biodiversity of farming regions and relatively high yields.

Farming impacts for most vegetables grown at Mash Direct own farm are lower compared to the impacts of vegetables sourced from additional suppliers.

Secondary date and proxy modelling have been used in conjunction with farming data from suppliers. More primary data can enhance the accuracy and validity of the results presented.

ECOLOGICAL IMPACT Serving Rating*

Impact	per 100g
Carbon (CO ₂ eq)	0.7g
Water Usage (L eq)	1400L
Water Pollution (PO43	eq) 1.2g
Biodiversity (SLI)	1.6

*per serving Calculated for sale in UK Online record: foundation-ear th.org/a1b1



1.3g

2.5g 3.2

2900 Ľ

В

A B C

Foundation -earth.org is a non profit organisation , giving you the tools to buy more sustainably.

Conclusion

As shown in this report, the task ahead of us as a company and the world is significant but necessary. If we do not follow what the science is telling us, then we face greater risks than the cost of adapting now. If we are to continue to grow and thrive, we must adapt to the climate emergency and reduce our impact.

Hopefully through reading this report you have gained a greater understanding of our company and our aims for the future. We are the combination of two energy intensive industries, farm and factory, but through combining the two we have already cut down on emissions and food waste significantly.

Finally, we pledge to publish our next Sustainability Report in Summer 2022 to update on our progress as we continue to adapt and drive down our emissions

Adam Patton, Sustainability Manager, Mash I

Sustainability Manager, Mash Direct





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