NAYLOR

NAYLOR INDUSTRIES PLC

NET ZERO CARBON STRATEGY

February 2022 Edition Version 1.0

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Director commitment

As a senior leader within Naylor Industries, I will support the below principles and ensure these are driven at all levels

Personnel

- Consideration to environmental aspects must be given when selecting new senior leaders to be business – including but not limited to energy/carbon awareness.

Energy

- Choose renewable, low carbon energy sources (zero Carbon if possible) to ensure carbon emissions from our electricity use are kept to a minimum.
- Where possible - reduce, avoid and eliminate the use of fossil fuels in the business.

Property and Assets

- When implementing new equipment, give foresight to energy efficiency and emissions.
- For maintenance, consider localality of replacement parts (distance of location, frequent replacements etc.).
- Energy and carbon consideration must be given to new sites and buildings.

Education/Training

- Ensure environmental training is issued to all staff and energy efficient practices are conducted throughout the business.

Support

- Allocation of resources for the annual quantification of carbon emissions.
- Support the EHS team to drive Naylor Industries 'journey to net zero', provide support and resources where required.

Part 1 – Context and Definitions

Before defining our approach and strategy in achieving net zero carbon footprint, it is important to define the term 'net zero carbon footprint'. 'Net zero carbon footprint' refers to achieving an overall balance of zero CO_2 (carbon dioxide) produced by our operations and by removing CO_2 out of the atmosphere. This overall balance may be achieved by means of reduction of carbon dioxide through reducing energy consumption, engineering controls, advances in carbon reducing technologies and behavioural controls. In addition to this, carbon offsets may also be used to 'cancel' out CO_2 emissions where eliminating is not possible. These controls may be incorporated into our strategy to achieve 'net Zero carbon footprint'. It is important to note that Naylor Industries PLC will endeavour to tackle Scope 1 and 2, direct and indirect CO_2 emissions respectively, as a priority – these are CO_2 emissions directly associated with our onsite activities. In due course, we will endeavour to reduce our scope 3 emissions.

Naylor Industries PLC is committed to taking a proactive approach to achieving 'net zero carbon footprint' and we will achieve this by working in-line with the strategy overview outlined in subsequent sections.

Definitions

CO_2	Carbon Dioxide
CCUS	Carbon Capture Use and Storage
H_2	Hydrogen
IETF	Industrial Energy Transformation Fund
NZIP	Net Zero Innovation Project
GHG	Greenhouse Gas
Carbon Footprint	Overall CO_2 emissions
Net Zero Carbon Footprint	Total emissions including emitted and captured carbon
SBTi	Science Based Target Initiative
ESOS	Energy Saving Opportunity Scheme
SECR	Streamlined Energy and Carbon Reporting
UKETS	United Kingdom Emissions Trading Scheme
Scope 1 Emissions	Direct emissions generated on site (E.g Natural Gas combustion)
Scope 2 Emissions	Indirect emissions generated offsite - Electricity
Scope 3 Emissions	Indirect emissions produced by third party but associated with own operations – Waste removal, deliveries, contractor haulage etc.
CHP	Combined Heat and Power (Generator)
HVO	Hydrotreated Vegetable Oil

Part 2 - Strategy Overview

1. Organisational Commitment

Commitment to achieving 'net zero carbon footprint' by senior leadership (CEO's, CFO's, Directors etc.) is essential to ensure the correct resources are allocated to the goal of achieving 'net zero carbon footprint'. In addition, securing support from senior leadership is essential in the overall company drive towards 'net zero carbon footprint'.

2. Quantification and Science Based Targets

Naylor Industries are committed to annual quantification of our carbon footprint. This is a crucial requirement when understanding our current impact on the environment in terms of carbon footprint, also highlighting areas where carbon emissions are most prevalent. This helps us to target areas to improve upon, also providing tangible evidence of any reductions we make. Summaries of our quantifications will be communicated within the business and will also be made publicly available upon request. We will quantify our carbon footprint, by commissioning a yearly GHG (Greenhouse Gas) quantification by an external consultancy. This will cover all sites. In addition, we will support this quantification by conducting Energy Saving Opportunities Scheme (ESOS) reports every 4 years. This will help us understand energy intensive areas of the business. As stated, SBTi's (Science Based Targets Initiative) may be an option for quantifying our progress towards net zero carbon in the future but this is not an option for the business as it currently stands due to limitations in carbon reducing technologies.

3. Targeting and Implementation

This is the action phase of the strategy. Once sufficient quantification has taken place and our carbon footprint is clearly understood, we can then begin to target areas that contribute to our s. Once an area has been targeted, we will develop actions to reduce carbon footprint. To do this, we may seek support from; staff, consultants, educational establishments, technology providers, government agencies etc. (this list is not exhaustive). Where reduction of carbon footprint is hindered by lack of developed technology – we are committed to innovating and leading the way in developing methods to reduce carbon footprint. This may be done by collaboration with external organisations and by working with others to develop feasibility studies of new technologies. This may also include government funding to support projects. We will make every effort to drive projects forward by providing financial support and support in-kind where possible. Should these projects prove feasible, we will implement them as appropriate throughout the business.

4. **Monitoring**

For measures that result in significant reductions in our carbon footprint, a further quantification will be conducted to ascertain a detailed estimate of carbon footprint reduction.

In addition, once these technologies are implemented, this will not be the end of our journey. We will continue to monitor the efficacy of all our implementations to ensure they remain financially viable and effective at reducing and eliminating our carbon footprint.

5. **Reporting**

An essential part of our journey to net zero carbon will be reporting our successes (and failures) in carbon and energy reductions. This will be done in the form of a report which will form the basis of our progress and show which projects have been successful and which have not. This document will be available upon request and will also be communicated to senior directors on a year basis or as otherwise requested. In addition to this, we plan on sharing our successes with other businesses within our sectors (Plastics, Concrete and Ceramics). We hope this information will empower others to be able to act and reduce their carbon footprints using tried a tested methods already produced by our business. In time, we may choose to report our progress via SBTi (Science Based Targets Initiative), however, this will be dependent on environmental technological advances.

6. **Continual Improvement**

As a result of monitoring any implementations made, we will seek to make improvements where practicable with the aim of improving financial viability and the efficacy of reducing our carbon footprint. This will not only benefit us but will also benefit industry as carbon footprint reducing technology improves and is shared, becoming cheaper and more widely available. Reduction of our carbon footprint will be a continual process throughout the life of our business.

Part 3 - Methodology

1. Introduction

This part of the document provides specific details on how Naylor Industries will enact 'The Plan' described in the previous section. Forming a how-to guide for anyone tasked with co-ordinating Naylor Industries PLC's journey to 'net zero carbon footprint'. This methodology also forms part of the net zero risk management, reducing the risk of time and information loss associated with changes in net zero coordinator position.

2. Revisions

It is also important to note, that due to the nature of our journey to net zero and the changes in legislation and technologies (and personnel), the Naylor net zero strategy document will be a 'live' document and will be reviewed regularly and subject to amendments and changes as required. Minor revisions will be grouped together and listed in 'Appendix 1' under revisions with the revision details and dates listed. Any major revisions will also be listed in the same section but may result in the document being re-released and signed off by directors as appropriate.

3. Projects

All projects relating to CO2 and energy reduction will be recorded in appendix 2 and 3 of this document. Projects that have already taken place and have been completed this will be recorded in appendix 3. Information on completed projects should be specified - costs, estimate or actual energy/carbon reductions, date completed. For new or ongoing projects, information for this will be recorded in appendix 2 and will include information such as project details and completion dates.

4. Project Management

Emission reduction projects will be prioritized based on two principles, first and mostly importantly – projects with the largest impact on emissions. The purpose of this is to ensure that from an environmental standpoint, the company takes actions that have the biggest impact on Carbon reductions to help combat climate change. Secondly, the 'low hanging fruit' principle will be applied to projects that are easy to achieve. This may be in the form engineering controls behavioural changes that result in energy efficiencies. Selection of projects will be based on findings from GHG quantifications (compiled by third party environmental consultant) and from research into effective solutions to identified emission sources. Aspects of the proposed project will then be investigated for, financial costs, projected emissions reductions, risks and unintended consequences. These will be detailed and compiled into a report for critique. Projects reports will be peer reviewed by EHS team and senior directors for economic viability, positives, negative etc. Projects will be selected based on the above criteria (prioritising projects that coincide with either of the above principles). Once a team has been allocated to the project, time scales and responsibilities will be set to ensure the project is managed effectively until completion. For projects with significant proposed emission reductions, a further emission quantification will be conducted to test the actual emission reduction.

5. Organisational Responsibilities

1. The **Chief Executive Officer** is responsible for driving organisational commitment to achieving net zero carbon footprint.
2. **Directors/Production managers and supervisors** are responsible for driving their respective team's approach to achieving net zero carbon emissions, encouraging best practice among team, and ensuring adherence with defined measures implemented by EHS. This group is also required to ensure that renewable energies are selected in favour of non-renewable energy sources where possible and to select new equipment based on Engineering for Sustainable Development (E4SD) principles, guidance to be outlined in subsequent sections. In addition, environmental aspects should be considered when selecting new staff (for example, Moral attitude towards environment, distance from workplace etc.)
3. The **EHS Team** are responsible for coordinating the organisations approach to net zero. This includes, investigating and implementing new technologies, securing funding where applicable, developing and providing training to all staff, communicating progress to key stake holders, collaborating with other teams within the business to facilitate net zero carbon footprint progress, collecting/collating and communicating data in relation to net zero and ensuring compliance with any regulations related to net zero or mandatory carbon reporting, liaising with environmental consultants, creating and maintaining any documentation required in relation to net zero.
4. All **Operatives** are required to follow any work instructions in relation to achieving net zero and as such required to receive any training required as part of the company effort to achieve net zero carbon emissions.

6. General Approach to achieving Net Zero

Naylor industries PLC will approach achieving net zero carbon footprint methodically by addressing carbon emissions in 'scope' order across all divisions. This will be done by addressing scope 1 emissions, then scope 2, then scope 3. We believe that we can have the greatest influence over our own direct emissions. Therefore, by addressing our direct emissions, we believe that this will have the greatest initial impact on CO_2 emissions at an organisational level but also nationally - we would encourage the adoption of this approach by other organisations.

7. Monitoring and recording progress

Progress towards net zero will be recorded using the 'J2N0' spreadsheet. This spreadsheet will track the progress by listing key objectives set by the EHS team with set responsibilities and time frames. This spreadsheet will be monitored monthly, and progress communicated to key stakeholders

Part 4 – The Plan

1. Introduction

As stated above emissions will be addressed in a logical order, scope 1, 2 then finally scope 3. The below table shows the group's greenhouse gas emissions (excluding Gainsborough). The below table (figure 1.1) is set out to show emissions grouped into sources, for example, natural gas, gas oil etc. Using this table, we can determine the processes or fuels which generate the largest sources of emissions, subsequently looking into further detail at the responsible equipment or process.

2. Summary of group CO_2 emissions

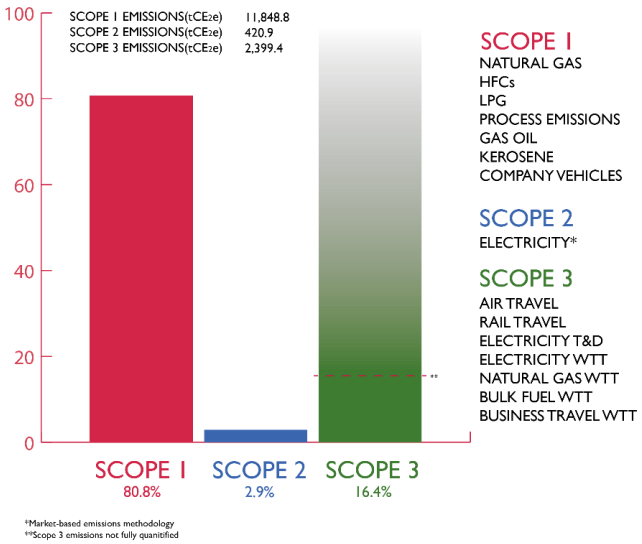

Figure 1.0 - Scope 1,2 and 3 emissions

GHG Emissions Scope	Source	GHG Emissions (tCO_2e)	% of Total
Scope 1	Natural Gas	9,996.9	68.1%
Scope 1	HFCs	16.3	0.1%
Scope 1	LPG	3.3	0.0%
Scope 1	Process Emissions	1,450.6	9.9%
Scope 1	Gas Oil	325.9	2.2%
Scope 1	Kerosene	20.3	0.1%
Scope 1	Company Vehicles	35.4	0.2%
Scope 2	Electricity*	420.9	2.9%
Scope 3	Waste	4.6	0.0%
Scope 3	Water	6.9	0.0%
Scope 3	Air Travel	28.2	0.2%
Scope 3	Rail Travel	1.3	0.0%
Scope 3	Electricity T&D	390.0	2.7%
Scope 3	Electricity WTT	512.8	3.5%
Scope 3	Natural Gas WTT	1,300.1	8.9%
Scope 3	Bulk Fuel WTT	115.6	0.8%
Scope 3	Business Travel WTT	39.9	0.3%
Total Scope 1 Emissions (tCO_2e)		**11,848.8**	**80.8%**
Total Scope 2 Emissions (tCO_2e)		**420.9**	**2.9%**
Total Scope 3 Emissions (tCO_2e)		**2,399.4**	**16.4%**
Total GHG Emissions (tCO_2e)		**14,669.1**	
***Market-based emissions methodology**			

Figure 1.1 – Detailed Group GHG emissions

3. **Scope 1**
    a. **The 'Low hanging fruit' principle - Energy efficiencies (technological) and behavioural changes** – The low hanging fruit principle refers to cost-effective, easy to implement behavioural and technological changes/improvements that can be made in the short term, which reduce CO_2. As such, we are currently working with Sheffield Hallam university and have two MSc project students working on energy efficiency projects. Current proposals suggest energy efficiencies on the Shuttle kiln/driers and heat recovery for the CHP (Combined Heat and Power Generator). In addition to this, we will be conducting energy awareness training across the business, we hope this will be foster greater energy consciousness within our employees – leading to long term energy-saving behaviours – such as turning equipment off when not in use, reducing heating, turning lights off etc. We are also investigating the feasibility of other projects such as, heat recovery from air compressors, reviewed lighting systems and replacing inefficient motors. **Energy Efficiencies (technological) and behavioural changes – 5% CO2 reduction**

    b. **Reducing natural gas**
        i. **Hydrogen (H_2)** – Evidence strongly suggests that fuel switching to hydrogen (H_2) will play a significant role in reducing carbon emissions from natural gas and provide a sustainable source of combustible fuel for firing kilns. Currently (as of 09/11/2021) we have partnered with the BCC (British Ceramics Confederation and Glass futures and are supporting trials of Hydrogen-fired kilns, a submission for IETF funding will be made towards the end of 2021. We anticipate that hydrogen will not form a 'standalone' gas for firing kilns but will be part of a hydrogen/natural gas mixture – approximately 20/80% respectively. This will help reduce our emissions from natural gas by 20%. In addition to this, we will investigate biogas (bio methane) to replace non-renewable natural gas. This may help offset the remaining 80% of emissions from our gas use, however, this will be determined by governmental legislation on 'green gases'. Therefore, we can estimate a conservative 20% overall reduction in CO2. **Hydrogen Technology – 20% CO2 reduction**

ii. **CCUS –** Carbon Capture Use and Storage is another vital technology that needs to be utilised by the ceramics sector to enable significant carbon dioxide reductions. This technology is however, underdeveloped at the time of writing. While in use in other sectors, it is yet to be trialled within the ceramics sector. Our plan is to conduct emission sampling on our kilns to determine the levels of CO_2 and velocity rates from our chimney stacks. Once we have this information, we can provide information to CCUS providers who will then be able to tailor CCUS to our specific requirements. From this, a generic feasibility study will be conducted to ascertain viability, should this be successful, a specific feasibility study will then be conducted on specific equipment. If this is successful, we will then roll the technology out to other kilns. This technology will be localised and cannot be installed as one single structure within the clay business. Initial estimates of the efficacy of CCUS are in the region of 90-95% effective at capturing CO_2 emissions from escaping into the atmosphere. One major aspect of CCUS is to consider where the captured CO_2 is sequestered to, following capture. Initial information suggests that if CO_2 is sequestered within the business, then it can count towards schemes such as, UKETS and therefore considered captured emissions. ***Side note*** – we are currently exploring the feasibility of sequestering CO2 into one of our concrete businesses. Alternatively, CO2 can be sold to soft/hard drinks manufacturers at a reasonable rate per tonne. **CCUS – Conservative estimate 90% CO_2 reduction**

iii. **Energy efficiencies/heat recovery –** At the time of writing - Naylor Industries PLC are currently working on 2 projects with Sheffield Hallam University on energy efficiencies and heat recovery. The first project – we have enlisted the help of 2 MSc students to assess 3 pieces of equipment – Shuttle kiln 2, Shuttle Dryer 2 and our CHP unit. We anticipate that these projects will deliver energy reduction and heat recovery in all 3 pieces of equipment (percentage reductions not yet understood). Project 2 – 'Hallam Energy' (Energy consultancy) are investigating potential upgrades on our continuous kilns – it is anticipated that modernisation of the kiln burners and insulation etc. will help reduce gas consumption by 10-20 %, however, this has yet to be confirmed.

iv. Summary of potential reductions in CO2

	Reduction (TCO2)	Total TCO2 emitted	Reduction
Total gas emissions		9600	N/A
Introduction of H_2	1920	7680	20%
Introduction of CCUS	6912	768	90%
Energy Efficiencies	TBD	TBD	TBD
Total gas emissions reduction	9216	768	96.00%

Figure 1.2 - Potential total TCO_2 reduction (Based on 2020's UKETS gas figures)

b. Reducing process emissions

i. Although this area has not been full considered at this present time, we believe that the following aspects will play a role in reducing associated emissions - process optimization, material additives, material reductions, yield increases.

c. Gas oil

i. Fuel switching mobile plant – We are investigating the feasibility of switching from polluting diesel mobile plant to either electric vehicles or HVO fuel substitutes. Full electrification will completely remove emissions (providing green electricity is purchased). HVO will reduce emissions by 90% compared to diesel. **Fuel switching mobile plant – 90% CO_2 reduction from gas oil**

ii. Operator awareness – We will implement a program of energy awareness for all plant operators and engage on energy efficient driving, reducing plant idling and encouraging only necessary plant operation.

d. **Reducing deminimus emissions (propane, acetylene, kerosene)** – Our current objective is to offset the above using carbon credits (tree planting schemes or equivalent). Due to the lack of alternative technologies and the reliance on these sources for continuation of production, it is not yet feasible for us to eliminate them from processes. However, should alternative fuel sources become viable and economically feasible – we may choose to adopt in due course. Fortunately, these fuel sources only produce a relatively small amount of CO_2 and as such can be easily offset.

e. **Offsetting unavoidable residual emissions –** at the point where large-scale implementations have been made to reduce carbon emissions and potential restraints in available technologies becomes apparent, we will then seek to offset remaining unavoidable emissions using carbon offsetting schemes. At the time of writing, this is not something we have investigated in detail, therefore, what options we choose to offset emission will be decided upon reaching this point. We will, however, commit to offset our emissions using a certified method.

4. **Scope 2**
   a. **Electricity** – Naylor Industries PLC is committed to purchasing electricity from renewable energy providers. Electricity purchased is either 'zero' carbon or low carbon.

5. **Scope 3**

Scope 3 emissions account for the largest amount of CO_2 emissions Naylor Industries is responsible for. We estimate our scope 3 emissions to be approximately 80-90% of our total greenhouse gas emissions and are associated with aspects such as haulage, water use, resources, employee travel etc. (not exhaustive). We have conducted an initial scope 3 GHG quantification (see above), however this is not an exhaustive list and was never intended to be a thorough investigation of our scope 3 emissions. As stated above, we intend to address our emissions in a logical order with scope 3 emissions being the final group of emissions we address. Based on solid industry projections - we also anticipate that at the point of embarking on reducing our scope 3 emissions, that much of industry and the infrastructure associated with our scope 3 emissions will have undertaken emissions reduction associated with their processes, which subsequently, are interlinked with Naylor Industries PLC emissions. Therefore, our scope 3 emissions will be lower as a result. In the meantime, we will commit to encouraging our customers and suppliers/supply chain to reduce their emissions where possible and foster a culture of emissions reduction externally from the business. An initial plan of how we plan to address scope 3 emissions is detailed below.

a. **Screening Analysis –** We will commit to a detailed screening analysis of our scope 3 emissions – this will be conducted by a 3rd party environmental consultant on our behalf. However, the intention is to be fully involved in the process from start to finish.
b. **Encouraging 3rd parties** - Encouraging suppliers/customers/supply chain to reduce carbon emissions and support them to do so where practicable.

6. **Naylor Products – carbon footprint**
    a. At the time of writing, Naylor Industries PLC has assigned the Naylor Product Development team (in collaboration with the EHS team) to investigating the feasibility of assessing product carbon footprint. However, there is no product assessment currently being undertaken. Due to growing demand from suppliers/customers, Naylor Industries PLC will commit to product carbon footprint assessments in the near future.

7. **Engineering for Sustainable Development**
    a. Sustainable engineering is the process of using resources in a way that does not compromise the environment or deplete the materials for future generations. Sustainable engineering requires an interdisciplinary approach in all aspects of engineering. Sustainable engineering applies to a variety of aspects, including manufacturing, new and existing construction, energy systems, transportation, waste management, and environmental remediation. Engineering for sustainable development should be implemented and considered when, purchasing new equipment, retrofitting, or constructing buildings, developing site infrastructure (inc. IT systems), collaboration with suppliers and contractors purchasing raw materials/resources/energy, waste management, water management and land management.

Figure 1.3 – Engineering for Sustainable Development '12 principles'

Part 5 – Conclusions

Naylor Industries PLC firmly believe that implementing the strategy as described above will provide a solid framework in enabling us in achieving a 'net zero carbon footprint'. While the timeframe over which this will occur remains unknown at this point, we aim to achieve this by 2050 – inline with current government guidelines (January 2022). The strategy described above will remain a 'live document' through our progression towards net zero carbon footprint and will be modified and adapted in accordance with technological advances, best practices and as new information becomes available.

Appendix 1 - Revisions

Document	Date	Revisions/Amendments
February 2022 Edition Version 1.0	February 2022	n/a

Appendix 2 - Summary of projects

Project description	Site	Proposed benefits	Date started	Proposed Completion date	Completed?
CCUS	CAW	Carbon reduction	October 2021		
H2 – LCWG	CAW	Carbon reduction	September 2021		
MSc Projects	CAW	Energy/Carbon Reduction	October 2021		
Thermal Battery	CAW	Energy/Carbon Reduction	October 2021		
Hallam Energy/Thermal Battery/ Heat Recovery	CAW	Energy/Carbon Reduction	January 2022	March 2024	
Lighting improvements	CAW	Energy/Carbon Reduction	2021		
Compressor efficiencies	CAW	Energy/Carbon Reduction	2021	n/a	Yes

Appendix 3 – Completed projects and quantified benefits

Project description (details of project, emission source, scope, cost)	Division	Date started	Completion date	Quantified benefits (energy reduction, co2 reduction etc)
Air Compressor upgrade	Clay (Caw)	n/a	December 2021	119426kw(h) saved per annum 15 tons CO_2 saved per annum