Carbon Reduction Plan

Supplier name: Darwin Group Ltd

Publication date: October 2022

Commitment to achieving Net Zero

Darwin Group Ltd is committed to achieving Net Zero emissions by 2045.

Baseline Emissions Footprint

Baseline emissions are a record of the greenhouse gases that have been produced in the past and were produced prior to the introduction of any strategies to reduce emissions. Baseline emissions are the reference point against which emissions reduction can be measured.

Darwin Group's first reporting year and baseline year are the same 12-month period

Baseline Year: 2021	
Additional Details relating to the Baseline Emissions calculations.	
We have selected the 12 months ending 31 December 2021 as our Baseline year – this covers the consumption and emissions related to the business activities for Darwin Group Ltd. The Operational Boundary is both Financial and Operational Control. This is our first report and so the baseline and current reporting period are the same. We have reported on all the required emissions and can confirm that the reporting for our Scope 1 & 2 emissions is in accordance with the Streamlined Energy and Carbon Reporting regulations whilst the mandatory subset of Scope 3 emissions has been calculated in accordance with the GCH Protocol's Technical Guidance for Calculating Scope 3 Emissions (version 1.0). Not all data is complete and totally comprehensive, however we have clearly identified where this is the case, explained our calculation methodology, and set out in our 'future initiatives' section of this plan our project plan and timelines for the required improvement measures.	
Baseline year emissions:	
EMISSIONS	**TOTAL (tCO_2e)**
Scope 1	**74 tCO2e**
Scope 2	**45 tCO2e**
Scope 3 Upstream transportation and distribution Waste generated in operations Business travel Employee commuting Downstream transportation and distribution	**340 tCO2e**
Total Emissions	**459 tCO2e**

Current Emissions Reporting

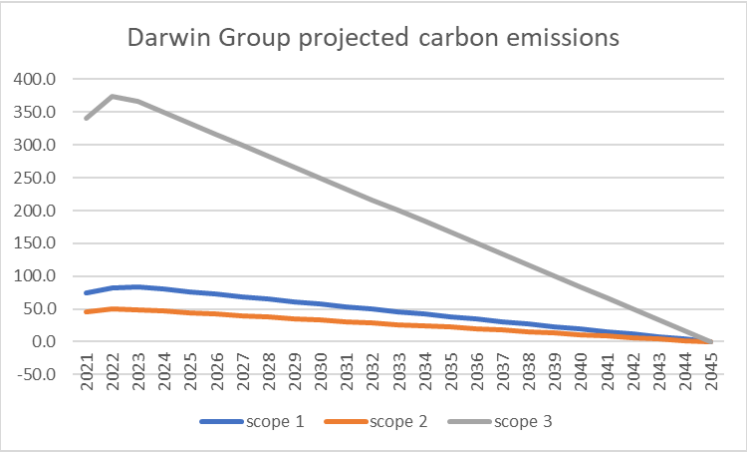
Reporting Year: 2022	
EMISSIONS	**TOTAL (tCO_2e)**
Scope 1	**74 tCO2e**
Scope 2	**45 tCO2e**
Scope 3 Upstream transportation and distribution Waste generated in operations Business travel Employee commuting Downstream transportation and distribution	**340 tCO2e**
Total Emissions	**459 tCO2e**

Emissions reduction targets

To continue our progress in achieving Net Zero, we have adopted the following carbon reduction targets.

Our Carbon emissions in 2021-2022 were 459tCO_2e, however, the figures were artificially reduced by the impact of COVID-19. We are a growing company, and this combined with employee commuting (our biggest source of carbon emissions) as staff return to the office means that our carbon will actually increase in the period 2022-2023. Thereafter, we project that carbon emissions will decrease over the next five years to 456tCO2e by 2027. This is a reduction of 9%%

Progress against these targets can be seen in the graph below:



Carbon Reduction Projects

Carbon Reduction Plan Vr1

Completed Carbon Reduction Initiatives

The following environmental management measures and projects have been completed or implemented since the 2021 baseline.

Commented [RN1]: Jim, do we have anything that we can claim that we have done over the last 12 months ?

Since inception in 2006, Darwin Group Ltd (DGL) has made a substantial investment in R&D, focused on new construction materials and new building technologies and processes. We are ISO 14001 accredited and are continually reducing the carbon footprint of our activities.

DGL is the first company in the industry to commission an external report (undertaken by Mtech Consult Ltd) on the full environmental life cycle assessment of our products. The results of this showed that our buildings are very sustainable and sympathetic to the environment. Compared with traditional building, offsite building through excellent energy efficiencies and build process can have up to 70% less of a carbon footprint.

As a result of continued improvements, we can commit to affordable modular buildings manufactured to the highest levels of environmental sustainability, constructing all buildings to meet at least a BREEAM Excellent rating. These are delivered through a turnkey package that includes initial concept designs and feasibility studies, planning applications, and building regulation compliance. We seek advice from our in-house LABC approval, BREEAM, SBEM, EPC, and Passivhaus assessors and stay up to date with the latest sustainability innovations, such as heat scavenging and distribution, to offer the most sustainable solutions to our clients.

Some of the many of DGL's modular construction approach include:

- **Reduced material waste:** <1.5% compared with 10% for construction sector generally. (Source: WRAP),
- **More efficient factory labour:** this has been shown to be 300% more efficient than the same operation on site. (Source: WRAP),
- **Reduced energy consumption:** the energy consumption during production has been shown to be >60% less than traditional construction. (Source: KPMG),
- **Fewer materials used:** a key feature of our MMC approach is that we require fewer material deliveries to the construction site, typically >90% less. (Source: Building Intellect),
- **Better energy performance:** independent studies have shown that factory build can achieve a DEC (Display Energy Certificate) rating improvement of typically 24% compared with traditional construction. (Source: Building Intellect),
- **Reduced CO2:** each DGL two-bed, four-person home reduces CO2 emissions by 162 Tonnes over a 60-year life span due to combined running costs and maintenance compared with traditional build (Source: Mtech Consult).

Planned Carbon Reduction Initiatives

As you can see from the above initiatives, Carbon Reduction and Care for our Environment has been at the heart of everything that DGL has done since we delivered our first Modular constructed school building in 2007. However, this is our first Carbon Reduction Plan, and we intend to use it to guide our actions using the same rigorous approach that we bring to all our programmes. Our initiatives will therefore follow four categories of activities:

Measurement

To help track our progress and help dedicate resources to the areas of greatest impact, we plan to improve our measurements though the following activities:

Scope 1: We are confident that our measurement of our Scope 1 emissions is accurate, but we will codify our means of capturing this data to enable us to update it more regularly and easily than has been the case with this initial Carbon Reduction Plan.

Scope 2: We are confident that the data we have received from our energy supplier is accurate and delivered in a timely manner. In the short term, we see no improvement in the measurement of these emissions.

Scope 3: Our Scope 3 reporting, currently encompasses the Cabinet Office's categories of:

- **Business travel:** We are confident that our business travel emissions are accurate. However, as with Scope 1, we intend to codify this to enable the data to be more easily captured, allowing us to make it available to Management on a quarterly, rather than annual, basis.
- **Employee commuting:** As with with many of the examples provided by the Greenhouse Gas (GHG) Protocol, we have measured only a percentage of our staff's commuting habits and extrapolated up from this. We intend to increase this to an annual polling of all staff, and our internal communications department will present the survey a manner that will encourage our staff to become more engaged with emissions reduction.
- **Factory waste:** We are confident that the data provided by our waste removal company is accurate, but, as with our other emissions, we intend to capture this information quarterly.
- **Upstream & downstream:** We are confident of the accuracy of our upstream emissions data. Regarding our downstream emissions, we have asked our tier 1 suppliers for their carbon data, as their services account for around 90% of our downstream emissions. We will expand this data collection to include our tier 2 suppliers. In the meantime we have inflated our Tier 1 supplier's carbon by 10% to account for the likely Tier 2 & 3 emission. Furthermore, we are looking at other matrices to see if we can define a carbon cost per m^2 of manufactured building, both on our upstream and downstream costs. This will enable us to more closely measure the carbon upstream and downstream as we expand the company.

We plan to expand our measurement and reporting to include other Scope 3 Categories, as defined by the GHG Protocol, as our measurement tools become more sophisticated, and the emissions data becomes available. In the meantime, our planned reporting initiatives include:

Governance

We will appoint a Carbon Reduction Champion whose role will be to maintain, update, and improve our Carbon Reduction Plan, which will be signed off by a member of the Board. The Carbon Reduction Champion will report to the Board on all initiatives quarterly and will be empowered to implement and oversee all improvements signed off by the Board. In addition, they will oversee the annual refresh of the Plan.

Planning

We will carefully examine the outputs of our carbon measurement activities using a cost-benefit analysis. This will enable us to understand the cost and benefits of each improvement, and therefore more accurately plan where our most significant improvements will be implemented.

It should be noted that DGL is a growing company, and that increasing one's business activities inherently results in more carbon being produced. However, this also means that the reductions we make to our downstream emissions will be even more impactful.

Implementation
We are committed to reaching Net Zero by 2045 and will stay up to date with new, innovative technologies and processes that will aid us in achieving this goal. We are confident that these innovations, along with our robust processes, procedures, and approaches, will enable us to meaningfully reduce our carbon emissions.

The benefits of our approach

Employing the Passivhaus principles

In 2021, DGL retained the services of a globally recognised sustainability consultancy, Cundall, to develop a Net Zero Carbon MMC solution compliant with PPN 06/21. We chose to partner with Cundall because of their impressive industry leading sustainability credentials including Certified Lead Designer, active Gold Leaf members of UK Green Building Council, and Net Zero technical advisors to government departments such as the Department for Education.

DGL's approach to design and construction for Net Zero is focused on providing a low energy and low maintenance solution, and we believe a healthy building design strategy should be based on biophilic principles to promote user wellbeing. Our design philosophy is based on the five principles of Passivhaus:

1. High quality insulation, with a super insulated envelope,
2. Heat control and high-performance windows,
3. Airtight construction with a continuous airtight layer,
4. Heat recovery ventilation,
5. Thermal bridge free design.

The Passivhaus principles ensure designs maximise winter heat, summer cooling, natural light, and ventilation without summer solar gain. We have found this also results in there being minimal heat loads. Our designs always consider future climate adaptation and include cross ventilation, heat scavenging, and occupancy gains.

Reducing embodied carbon

DGL's MMC reduces embodied carbon by up to 90% & waste by up to 98%. Our innovative construction approach starts with the least energy intensive approach (passive/natural ventilation) to maximise thermal comfort and natural ventilation and maximise green technology. For all projects, our Net Zero Carbon cost allowance is less than 5% of overall net construction cost.

We transport modules via low carbon hauliers, tracking distance and CO2 in our BREEAM scoring and reporting tool, and then use this data to identify further carbon reduction opportunities.

We prioritise local suppliers, which reduces travel mileage and the associated CO2 emissions. On all projects, we work closely with our supply chain to minimise waste and maximise recycling and reuse by regularly reviewing both products and packaging.

Reducing whole-life carbon costs

DGL's approach to whole-life carbon costs is focused on the Passivhaus Planning Package tool and energy software PHRibbon. The PHRibbon cross-references quantities of all materials to be used, their densities against prescribed list of carbon data derived from Environmental Product Declarations (EPDs) and ICE database of embodied carbon. The software also captures cost for component replacement during the building's lifespan. Data is inputted by Cundall, and the process is overseen by our Design Manager.

We carry out operational energy assessments utilising recognised methodology, such as TM54 or Passivhaus. This establishes a true picture of a building's regulated and unregulated energy consumption at an early stage, following which we can agree energy intensity targets with the client.

DGL and Cundall work closely with clients to consider any Carbon Reduction Plans that they may already have in place. During RIBA stage 2 of each project, we engage with them via an options workshop attended by our Design Director, Design Manager, and representatives from Cundall. We conduct optioneering, focusing on achieving Net Zero carbon and sustainability opportunities by minimising embodied and operational carbon, and capturing this in PHPP energy software. We identify early quick wins, such as using local supply chains and increasing a fabric-first approach incorporating Passivhaus. We also factor in the client's existing site infrastructure, as well as considering the proposed building orientation and efficiencies that may be achieved by considering the proposed use, footprint, and layout.

During the workshop, we identify Net Zero carbon, energy intensity, and sustainability opportunities, such as:

- Establishing decarbonisation pathways for all energy sources,
- Reviewing the client's existing estate strategy and suggesting improvements to existing buildings,
- Carefully designing glazing to allow both air movement and good daylight, where possible reducing the need for artificial lighting and mechanical ventilation,
- Using LED lighting with good lumen efficiency,
- Reducing waste,
- Exploring carbon offsetting,
- Maximising standardisation and digitalisation,
- Implementing low water usage measures throughout the building,
- Using low carbon intensity materials,
- Employing measures such as leak detection and presence-controlled lighting,
- Using energy efficient HVAC plant and controls.

Following the meeting, DGL produces a detailed report covering the opportunities discussed, strategies for achievement, and our risk mitigation approach. We share this, as well as all other outputs, with clients via an agreed Common Data Environment.

Throughout each project, DGL and Cundall hold regular opportunity enhancement workshops to refine the outputs of the initial workshop. Cundall produces Stage Reports detailing key decisions and any further risks or opportunities identified. They also conduct strategic options studies and present the results of these to the client. Throughout delivery, DGL engages in knowledge transfer exercises to enable the client's decisions to be as informed as possible.

Reference case - delivering some of the UK's first Net Zero Carbon & Passivhaus Education Schemes

DGL has long been considered the leading providers of MMC or Modular Design & Build Solutions, providing transformational projects for Local Authorities, Education Establishments, and the NHS across the UK.

In 2019, The UK government published its long-awaited Net Zero Carbon strategy setting out how it plans to meet the country's climate goals. Within the targets it states that all new build developments by 2030 achieve Net Zero Carbon in operation and for the wider estate to be brought up to speed by 2050.

With ongoing pressures on Local Authorities and Education Groups to provide sufficient spaces for the country's growing mainstream and high needs population, many are looking for innovative solutions in the race toward carbon neutrality.

With targets looming, there is now increasing pressure to step away from traditional build systems and embrace the speed, efficiency, and sustainability that MMC offers in the design and delivery of Education new builds.

Passivhaus design typically utilises the same materials as any traditional build system with the design life and durability relatively comparable. However, to achieve the Passivhaus Certification, not only do build materials have to be of the upmost quality but installation and execution must be met with meticulous care and attention which are all maintained internally through DGL's in-house manufacturing facility.

For example, the Passivhaus approved windows to be installed at St Edwards School will reduce heat loss by more than 70% compared to existing double-glazed windows. High quality external insulation will also be added to cut heat loss by 90%, supported by an energy efficient design standard that maintains an almost constant temperature.

This will ensure a comfortable and healthy learning environment, while minimising the energy demand of the building, significantly lowering the school's operational costs. The design was originally targeted to achieve Passivhaus Classic standard, however further design considerations enabled us to achieve Plus certification. The capital vs operational cost on the project means that the additional capital spend will be recovered by year 14 of the project lifespan.

We are extremely proud to be delivering some of the UK's first Net Zero Carbon & Passivhaus Education Schemes. The recent partnership with St Edwards School in Romsey, Hampshire will see the first Special Educational Project to achieve the enhanced Passivhaus Plus Certification. The new 631sq² teaching block will include six classrooms, group learning areas and a sensory room with the team of designers and architects at DGL taking up the challenge of creating an inspiring build that works in harmony with the Grade II listed former manor house.

Sally Webb, Director of Development at St Edward's School, said: "At St Edward's, we are committed to the stewardship of our environment and therefore carbon neutrality is a target that has a moral imperative for all of us and that is why we are delighted that the new build will be Passivhaus."

The project at St Edwards School was developed through a Pre-Construction Services Agreement making full use of DGL's in-house capabilities. This allowed us to develop the scheme from a blank canvas and create a real spirit of team collaboration from project concept to delivery on site. Many Schools and Local Authorities find this approach offers the benefit of cost-savings through the design development phase of the project as well as complete control and predictability of budget and programme at all stages of project delivery.

DGL is actively working alongside Local Authorities to provide information around achieving Net Zero Carbon & Passivhaus Certification across Education. Their accredited Continuous Professional Development Session (CPD) looks to outline the benefits of utilising a modular build system to cost effectively meet these credentials in line with the 2030 & 2050 Targets.

Declaration and Sign Off

This Carbon Reduction Plan has been completed in accordance with PPN 06/21 and associated guidance and reporting standard for Carbon Reduction Plans.

Emissions have been reported and recorded in accordance with the published reporting standard for Carbon Reduction Plans and the GHG Reporting Protocol corporate standard[1] and uses the appropriate government emission conversion factors for greenhouse gas company reporting[2].

Scope 1 and Scope 2 emissions have been reported in accordance with SECR requirements, and the required subset of Scope 3 emissions have been reported in accordance with the published reporting standard for Carbon Reduction Plans and the Corporate Value Chain (Scope 3) Standard[3].

This Carbon Reduction Plan has been reviewed and signed off by the board of directors (or equivalent management body).

Signed on behalf of the Supplier:

Jim Pierce – Deputy Executive Officer

Date: 04 October 2022

[1] https://ghgprotocol.org/corporate-standard
[2] https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
[3] https://ghgprotocol.org/standards/scope-3-standard