Northern Lighthouse Board

CARBON MANAGEMENT PLAN

Revision 2 - 2024

NLB's Response to the Climate Emergency and its drive towards making NLB Net Zero Carbon and all of its activities sustainable as soon as practicable

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Executive Summary

It is now internationally recognised that human activity has had a significant negative impact on the earth's environment and without action could cause irreversible change[1] . The UK government led the way in climate change policy – becoming the first major nation to declare a climate emergency and the first to set legally-binding emissions targets.

Government operations themselves, however, have their own environmental footprint and central government recognises the need for internal action, in addition to external policy setting, to minimise its own environmental impact and become more sustainable.

This Carbon Management Plan formally sets out Northern Lighthouse Board's (NLB) baseline carbon inventory and associated aspirations to becoming a Net Zero Carbon organisation.

NLB as an Arm's Length Body (ALB) of the Department for Transport (DfT), along with all UK Government Departments and ALBs, are therefore identifying and taking measures that will see them 'phasing' out operational emissions and moving towards net zero carbon operations going forward.

This revised document builds upon NLB's first Carbon Management Plan, launched in 2021 and links with the requirements of the DfT's Operational Sustainability Strategy[2]. On this basis, NLB continue to progressively implement a wide range of energy and resource efficiency measures in a specific phased manner as set out below, with delivery driven via NLB's annual corporate planning cycle.

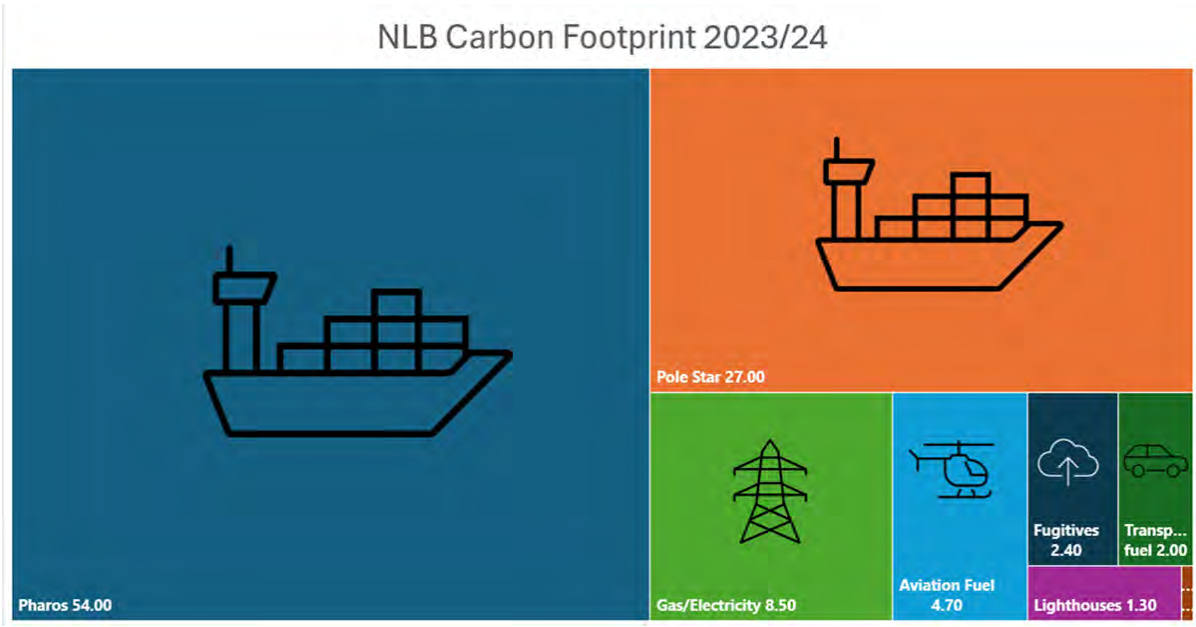
Phase 1 - Lighthouse Stations - Implementation and progression of currently available low carbon technology - by 2030

Phase 2 - HQ Buildings and Base - Implementation and progression of currently available low carbon technology - by 2035

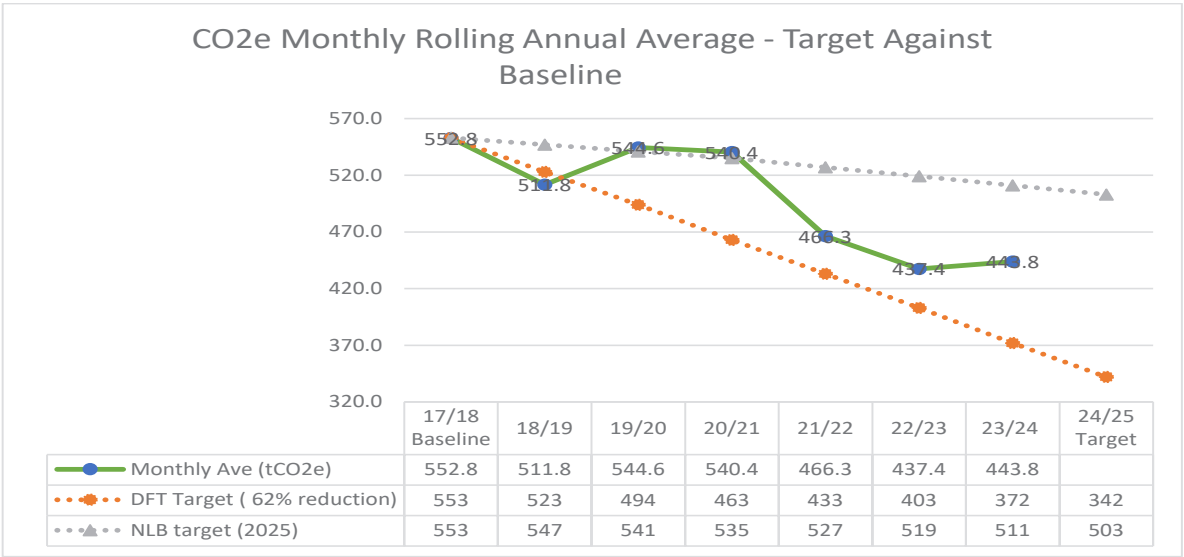
Phase 3 – Vessels and Marine Operations - Identification and implementation of future low emission fuels and propulsion technology - by 2040

Since the implementation of the 2021 Carbon Management Plan, NLB have been consistently reducing their footprint with the 22/23 Greening Government Commitments (GGC) reporting year revealing an overall reduction of 789tCO2e beyond our internal target (agreed with DfT) of 9% of total emissions; this was followed up in 2023/24 with another year where emission savings took NLB below target, this time by 712 tCO2e . While NLB are experiencing stability on their emissions level during 23/24, technological improvement, performance and behaviours will need to be implemented to enable NLB to continue on a downward trajectory. The biggest challenge remains addressing future GGC targets, influencing and reducing our supply chain emissions and effectively understanding and implementing strategies for measuring, monitoring, and reducing embodied carbon throughout our asset infrastructure and wider aids to navigation (AtoN) estate. It is expected that details of future reporting requirements will be shared during FY24/25 by DEFRA and targets set for NLB through Department for Transport (DfT).

1 IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C.
2 DfT operational sustainability strategy 2021 to 2025 - GOV.UK (www.gov.uk)



Nb: remaining 0.1% water use and waste disposal.



	17/18 Baseline	18/19	19/20	20/21	21/22	22/23	23/24	24/25 Target
Monthly Ave (tCO2e)	552.8	511.8	544.6	540.4	466.3	437.4	443.8	
DFT Target (62% reduction)	553	523	494	463	433	403	372	342
NLB target (2025)	553	547	541	535	527	519	511	503

Foreword from the Project Sponsor

This second iteration of NLB's Carbon Management Plan (CMP) achieves a number of important objectives. First it illustrates what has been achieved since the first plan was published in December 2021. The statistics speak for themselves, but what underpins the success to date is the commitment at the highest level within the organisation to invest in doing the right thing. The Climate Emergency and minimising the impact NLB has on the environment permeates throughout the Governance process and is a key consideration for the Executive and Non-Executives in their decision making, subordinate to, and only very slightly, to safety.

But strategic direction is only part of the story, what this plan highlights is the commitment from members of NLB's team from every area and professional group. Project and Asset Engineers are looking at technical challenges differently. Reducing carbon, increasing reliability, and minimising maintenance requirements are all now routine. The Vessels are being operated differently. Eco-steaming is now the norm, and the overall ship and helicopter programme is being planned smarter than ever before. And individuals are making better choices in their travel and are willing and proud to share innovative ideas to bring further improvement.

Looking to the future, this plan makes no pretence about the mountain we still have to climb. There is a lot to do, and for some elements we still do not have a clear way ahead, not least in how we will power our enduring requirement for ship and aviation operations. But with continued commitment, from Board Room to individual team member, to do what is right for our planet, we continue to lead the way and provide best practice for others to follow.

Mike Bullock OBE
Chief Executive

1 Introduction

1.1 General

NLB developed a comprehensive Carbon Management Plan in 2021. There has been an increased focus on environmental and sustainability issues as we work to deliver an enhanced carbon reduction performance across the organisation in line with the requirements of the Greening Government Commitments (GGC). NLB is the General Lighthouse Authority (GLA) for Scotland and The Isle of Man, providing Aids to Navigation for the benefit and Safety of all mariners. Whilst NLB is autonomous we work closely with our other GLA counterparts, Trinity House, and Irish Lights, forming a 'Tri GLA' alliance and more widely with other lighthouse bodies throughout the world via the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA).

NLB have always been conscious of the need to work with nature, and more recently to drive towards achieving improved sustainability, environmental, biodiversity and bio-security plans. Managing our environmental impacts and performance has allowed the organisation to work ever more effectively, embedding environmental awareness and seeking out ideas by which we can further improve our processes and performance in alignment with our Environmental Management System requirements as per our ISO 14001 Certification. This has enabled us to implement best practice in all aspects of operational service delivery to both mitigate against and adapt to the future environmental conditions that will impact our seas and coastlines. To reflect this, we have a specific Adaptation Plan highlighting potential risk areas enabling mitigation to be considered in advance of potential adverse events occurring.

This updated Carbon Management Plan represents how NLB are performing up to and including 2023/24 the plan will remain in place until the conclusion of the current GGC phase in 2024/25; but sections within this plan and the supporting data will be treated as a living document, updated to reflect any qualitative and quantitative changes required to aid understanding of our performance against stated aims in particular the agreed carbon emission reduction activities across our operations. An additional section has been added to this iteration of the Carbon Management Plan, to give stakeholders, the opportunity to see what a projection of Net Zero may look like and how NLB intend to get there. It may not be easy, but it is important that we do investigate and undertake the measures required to reduce our impact on climate change.

NLB continue to commit to providing up to date information in relation to our activities and performance; much of which can be accessed and viewed at www.nlb.org.uk .

Following a review by a panel of relevant experts, NLB were shortlisted for 'Company of the Year' at the 2023 UK Sustainability Awards, a welcome recognition of the strides taken by the organisation to do the right thing for our planet.

2 Carbon Management Strategy

2.1 Drivers for carbon management

While the key drivers for the Carbon Management plan remain unchanged, global events such as the COVID 19 pandemic and economic instability as well as local operational activities such as helicopter availability and the dry docking of vessels, have had to be considered in the context of the impact on NLB's sustainability performance.

Further global uncertainties such as ongoing regional conflicts impacting supply chains such as those supporting the production of the components for Electric Vehicle (EV) manufacturers provided additional challenges on top of the planned work programmes. NLB are tracking the risks associated with our activities via our Corporate Risk management framework and remain focussed on the improvement targets that have been established within the context of our strategic commitments incorporating the GGC targets. These have been implemented across all our operating departments via regular reviews, team, and Board meetings. In addition to this NLB's Performance Management System has been adapted to include a personal Environmental and Sustainability Objective which highlights these key topic areas to tangibly roll out ownership across the organisation. Practical improvements to assets continue to be supported by behavioural changes to target the necessary improvements, and by 2021/22 the NLB team had met the over-riding 5-year GGC target (agreed with the DfT) to reduce Total tCO2e by 9% from 2017/18 baseline.

Data collection continues to be a challenge; particularly finding the consistencies required across all the government departments to assess ourselves comparatively. NLB continue to enhance their framework of control in respect of GGC data quality and refinement. The creation of NLB's Business Improvement and Sustainability Coordinator position has assisted within this process and has benefited the organisation at both a Tri GLA and Departmental Level.

Drivers for NLB's Carbon Management Plan and agreed GGC Targets are highlighted in the following table.

Topic Area	Target Year 2021/22	Target Year 2022/23	Target Year 2023/24	Target Year 2024/25
Greenhouse gas emissions				
Reduce Greenhouse Gas Emissions (DfT Target)	10%	25%	40%	62%
Reduce Greenhouse Gas Emissions (NLB revised Target)	9%	9%	10%	10%
Increase ULEV Use	20%	40%	50%	100% by 2027
Reduce Domestic Business (non operational) Flights	5%	10%	15%	20%
Water and Resource Efficiency				
Reduce total amount of waste generated	4%	8%	12%	15%
Increase proportion of recycleable waste	10%	25%	50%	70%
Landfilled waste	30%	20%	10%	5%
Remove unnecessary single use plastics	10%	35%	70%	100%
Reduce water consumption	2%	4%	6%	8%
Paper Use reduction by 50%	12%	25%	37%	50%
Ensure water is measured NLB wide	25%	50%	75%	100%
Nature Recovery				
No negative impact from NLB activities	100%	100%	100%	100%
Adapting to Climate Change				
Adaptation Plan in Place	100%	100%	100%	100%
Sustainable Procurement				
Sustainable and efficient product compliance to achieve best long term value for money for society.	25%	50%	75%	100%
ICT and Digital				
Recuce amount of ICT waste to Landfill (2020 baseline)	25%	50%	75%	100%

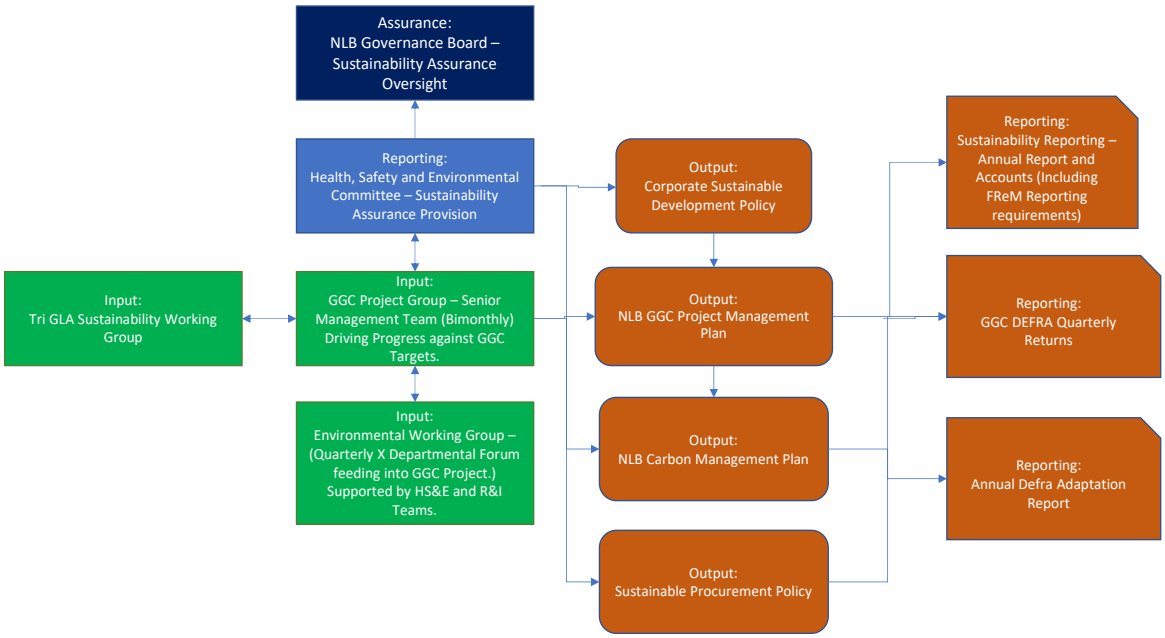
meets target	does not meet	requires data

NB: note that the figures in the table above are drawn from the targets agreed between DfT and DEFRA. Performance against these are measured quarterly at NLB HS&E Committee meetings, with full details and supporting narrative available in the Sustainability Paper submitted to the Committee.

2.1 Environmental and Social Governance

NLB's Governance Board continue to ensure that an integrated approach to reducing NLB's environmental impact is maintained in line with ongoing effective sustainability practice. In line with the Environmental Principles Duty, this involves ensuring that environmental principles are properly interpreted and proportionately applied to NLB policies and operations in order to deliver their objective of contributing to the improvement of environmental protection, sustainable development and by implication, carbon reduction. This will assist in the prevention of unintended environmental impact and contribute towards the achievement of a Net Zero Carbon outcome. The associated governance structure pertaining to this approach was published within NLB's Corporate Sustainability Policy[3]. This is underpinned via a Strategic Delivery Framework which is set out below.

Fig 1. Strategic Delivery Framework

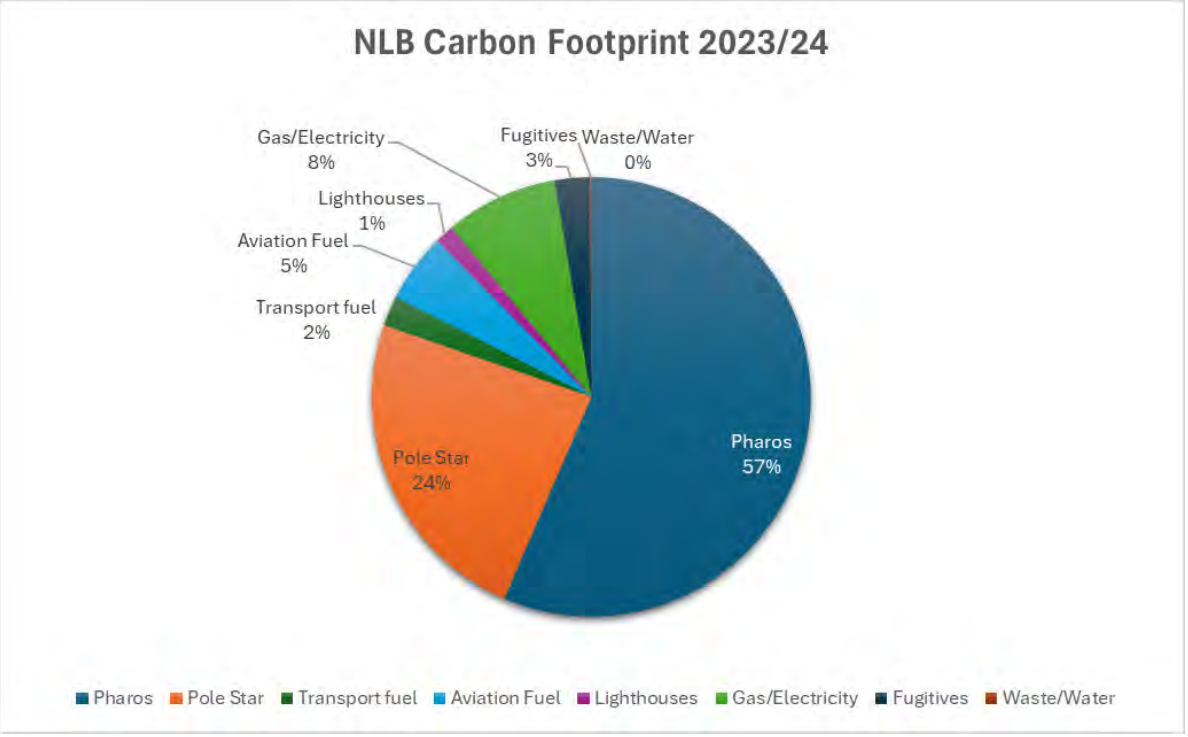


3 https://www.nlb.org.uk/wp-content/uploads/RI-POL-02-NLB-Corporate-Sustainability-Policy-2.pdf

3 Carbon Baseline and Reduction Performance

The Carbon Baseline was originally measured in 2017/18 and submitted to the DfT having gone through robust review from the Annual Report Working Group, Tri GLA Consolidation of Accounts and in alignment with the FReM (which is verified via the General Lighthouse Fund (GLF) Accountant on behalf of DfT). Following on from this the DfT reporting system has been improved upon to take account of tCO2e emissions for Scope 3 elements including Waste, Water, and Paper. In addition, NLB have enhanced their data capture in relation to both domestic and international travel within the context of their carbon footprint. Work has taken place and continues to ensure that data is consistent both between the recorded years and the method of approach by those organisations who are reporting the data. The DfT organise periodic meetings to bring organisations together to discuss any reporting issues to ensure ongoing consistence of data integrity across ALBs. Clarity around the tCO2 equivalent emissions conversion is important, ensuring that the correct conversion factors are being used. Well to Tank (WTT) elements are not included within current GGC reporting. However, elements for Transmission and Distribution are included and appear as a Scope 3 element, automatically separated by the DfT Diligent (Accuvio) Emission Database Reporting tool. NLB's current carbon footprint is set out below.

Figure 2: NLB Carbon Footprint 2023/24



3.1 CoreElements of the Carbon Reduction Plan

A great deal of work has taken place within NLB to ensure that Sustainability is culturally embedded and consistently remains everyone's concern. Responsibility for the GGC project and Sustainable Programmes have been formally reviewed and approved by the Board of Commissioners. From implementation via NLB's Mission Statement, Vision, and Values a culture of sustainable thinking has been embedded throughout NLB to promote sustainability in all activities; from governance to policy, programmes to working groups, with NLB's Performance Management System requiring that all staff commit to individual sustainability behaviours via their personal performance targets. The GGC Project Plan continues to be reviewed, with a working group identifying and escalating issues related to individual actions that support this plan.

The main CO2e reduction initiatives found within the Carbon Management Plan are found structured within the GGC Project Plan, where resources, time, cost, and quality measures can be found. In addition, all projects are subject to an investment approval mechanism via NLB's Programme and Project Board which also considers estimated carbon saving in addition to any contribution to climate adaptation planning. These attributes are then further worked up through the project gate review cycle and are included within the associated benefits realisation plan.

A selection of completed initiatives since the launch of the previous Carbon Management Plan are as follows:

- Efficient manoeuvre and transit of vessels – estimated 50 tCO2e saving from Vessel Masters and Chief Engineers trialling and implementing more efficient methods of operating the vessels. Improved reporting methods and analysis will support future visibility of this key efficiency driver.
- Reducing Non-Operational Domestic Flight numbers (reducing air travel to domestic meetings, conferences etc), while increasing Train travel by over 275% (2021/22: 10,400km – 2023/24 - 39422 km)
- Solar installation (Cape Wrath) – reduce reliance on diesel generators, supported by greener back up diesel generators. Projected 1tCO2e saving. (NB: additional savings from Outer Skerry/Eyre Point/ Cava solar enhancement/upgrade; and Thousla Rock upgrade)
- Inland wind Start Point, wind turbine installation replacing diesel generator. Projected 1 tCO2e saving.
- Transition to ULE Vehicle fleet – 4 electric vehicles now in the fleet (at May 24) – Projected 1 tCO2e saving.
- LED Changeout – Oban base replaced all inefficient lighting with LED equivalent – Projected 1tCO2e saving.
- Oban air source heat pump installed and operational.
- FM 200 Fire suppression system removal – the suppression medium is a hydrofluorocarbon (HFC) gas which has 3220 times the global warming potential of CO2. The FM 200 systems are to be removed completely from the estate with, where applicable, an environmentally friendly fire suppression gas installed to replace what was there previously. Since the last Carbon Management Plan Report FM 200 fire suppression systems have been removed from Ailsa Craig, Cape Wrath, Auskerry, Barra Head, Stroma, Flannan's with work currently on going at Sumburgh Head and North Rona.

These programmes of work all support the 2021 Carbon Management Plan which has seen NLB manage their emissions level below the targeted 2025 level for the past 3 years. (21/22,22/23 and 23/24). It is also important to note that the NLB's 'Pathway – to 2050' has several ongoing supporting measures including decarbonisation of the Office Estate and Oban Base (including heat pumps, boiler replacements, solarisation and rainwater harvesting).

The main savings however can be made through the methods of operating and managing our vessel fleet including attending AtoN sites and undertaking buoyage operations as sea. NLB's Vessel Replacement Project is working to replace the current POLE STAR which after 24 years is rapidly approaching the end of its economic life. The new vessel will enter service in 2026 and will meet the ambitious environmental targets set out in the UK Government Clean Maritime Plan, whilst future proofing NLB's ability to deliver its vital safety services over the 25 years following delivery. This marks a step change from what has gone before using modern technology to minimise the impact on the environment and will bring additional capability to help deal with the effects of Climate Change, in particular Extreme Weather. The hybrid vessel is designed to facilitate a mid-life upgrade to allow the installation of zero emission propulsion technology when it becomes available. In addition, optimal planning protocols are consistently being enhanced to ensure that we co-ordinate and operate our vessel fleet in as efficient a manner as possible, including effective co-ordination with our GLA partners in respect of integrated fleet co-ordination and emergency response requirements. This approach is underpinned by improved asset management planning to maximise journeys and to minimise waste; long term sustainable purchasing methods that will support government buying standards and aim to influence supplier behaviours regarding the future impact of Scope 3 emissions.

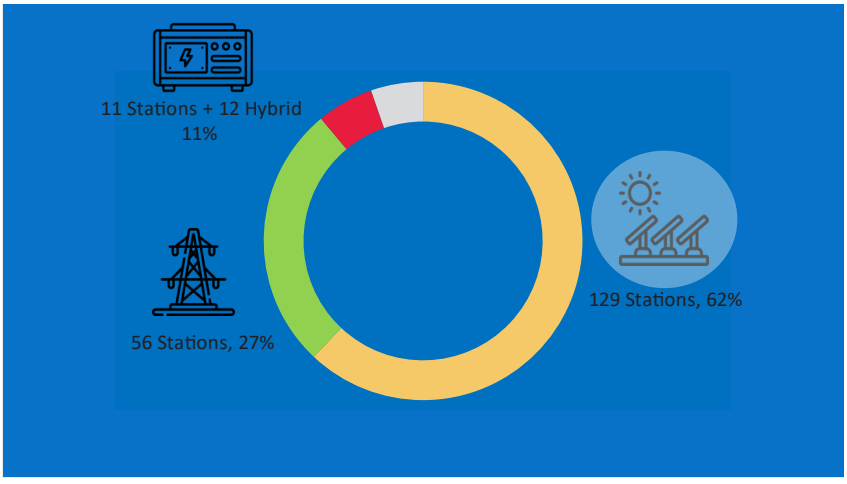
At all times NLB will ensure that there is continuous review of the Carbon Management Plan (as a living document) to ensure that we maintain the opportunity to take advantage of any disruptive technologies that could provide more effective solutions. (e.g. as a result of developments made externally in industry, or through the work completed by GRAD (GLA Research and Development) internally).

3.2 Carbon Reduction: Targets and Objectives

Phase 1 – Lighthouse Stations & Buoyage

A project was initiated to review the potential reductions that could be made in tCO2e emissions at NLB Lighthouse stations.

NLB started to decarbonise lighthouses 4 decades ago (mainly via solarisation and battery storage) and currently only 11 specific sites - at higher latitudes which make solar unfeasible due to winter daylength impacts and extended light ranges remain in operation using less efficient diesel technology.



However, following a technology review (considering blue sky solutions) these sites will be upgraded to hybrid diesel sites, using the latest LED technology and low carbon engines, in line with NLB's Capital Replacement Cycle.

Additionally, as we look at alternative fuel options that are 'greener' in comparison to diesel, a trial of hydrotreated vegetable oil (HVO) is to take place at an NLB Lighthouse and based on the findings of this, may offer the basis for HVO to be used elsewhere across the estate.

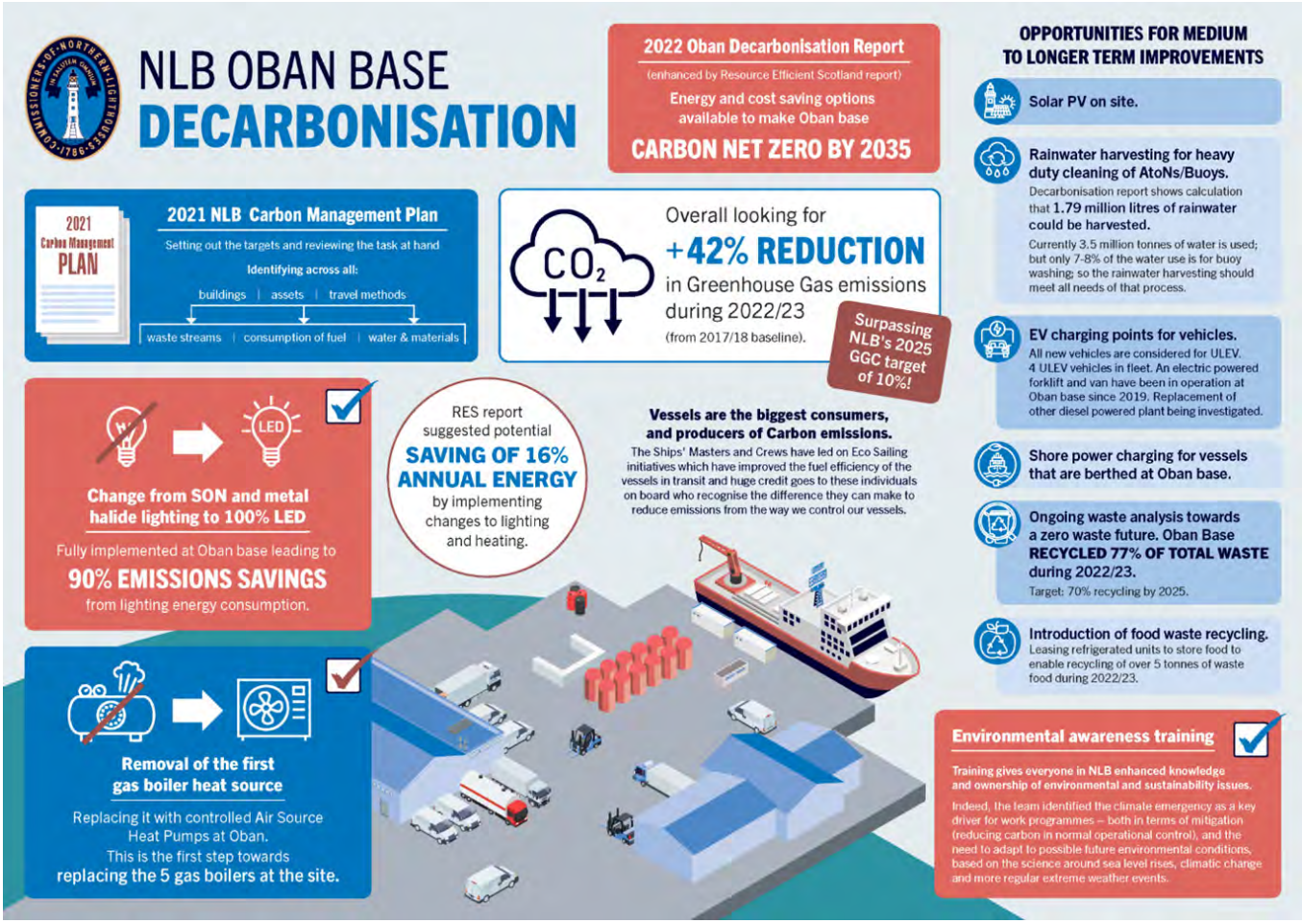
To date, approx. 1300tCO2e per annum has already been saved due to the work completed by NLB to decarbonise the AtoN estate using solar technologies between 1998 and 2018.
In addition, all of NLB's Marine Buoys are fully solar powered. This North Cardinal is located off the west coast of Orkney and has 4 solar panels rated at 60 Watts.

List of programmed lighthouse Carbon Reduction Projects

- Esha Ness – Lighthouse refurbishment – replace inefficient incandescent light with LED light source.
- Outer Skerry – AtoN Replacement – Upgrading solar panels, LEDs, Batteries
- Pentland Skerries – Major Refurbishment – Solar panels, battery storage.
- Hyskeir – Major Refurbishment – Solar panels, battery storage.
- Road End Lighthouses – charging facilities for Electric Vehicles
- Removal of FM200 Fire suppressant (GHG) from estate
- Corsewall – Lighthouse Major Upgrade – LED, removal of FM200,
- Girdle Ness – Lighthouse Major Upgrade – LED Upgrade, Removal of FM200, Generator removal.
- Solar installation – Reduce reliance on diesel generators, supported by greener back up diesel generators. Projected 1tCO2e saving. (NB: additional savings from Eyre Point/Cava solar enhancement/upgrade; and Thousla Rock upgrade)
- Island wind – Fair Isle South, replacing 3 diesel generators with all island renewable grid energy. Looking to tie into Island Renewable Electricity on Foula. Additionally, trial of vertical wind turbine located at Corran Narrows and the installation of 2xLeading Edge LE-V150 Storm Wind Turbines for Foula to provide additional charge to the optic batteries.
- DGPS Generator removal (Sumburgh Head, Butt of Lewis, and Earls Hill) – Projected savings of 1 tCO2e per project.

Phase 2 – HQ Building and Oban Base

In 2022 a refurbishment of NLB's Edinburgh HQ commenced which was linked to a comprehensive rewire project which was required on the grounds of electrical safety. Working with the Energy Saving Trust, NLB were able to establish a programme of energy efficiency measures which could be incorporated alongside the planned electrical and refurbishment works. NLB have also established formal Hybrid Working Arrangements which have enabled the organisation to reduce energy consumption in the office and remove an element of commuter emissions[4] in addition to delivering further reductions in paper use, water consumption and waste levels. The use of web-based 'virtual' meetings reduces the need for work related travel, and this is observed in significant reductions of air mileage. To further reduce air mileage where travel is required and web-based meetings and video conferencing cannot be used a Travel Policy Model has been established which has encouraged train travel as the preferred means of travel with this travel mode having seen a significant increase in the reporting years 2022/23 and 23/24.

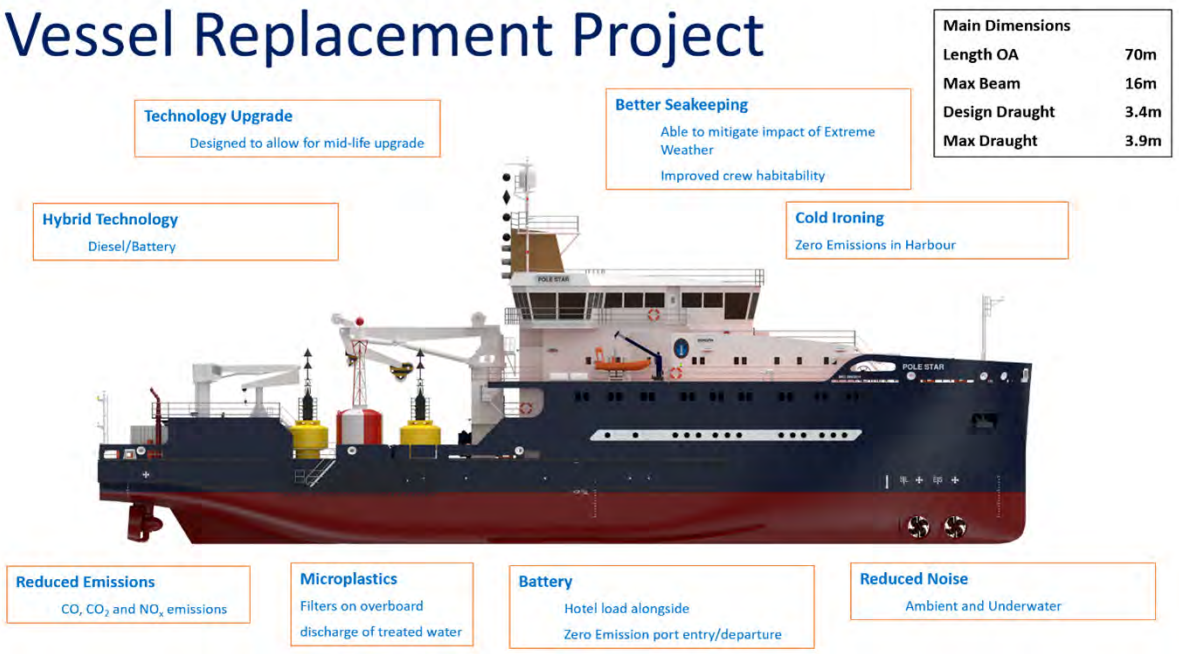


At Oban Base a Decarbonisation Report was created in 2022, and this Sustainability Infographic was developed to share awareness of NLBs progress. 3 specific projects were identified for progression.

1. Rainwater Harvesting and Recycling
2. Rooftop Solar Generation and storage
3. Low Carbon electric heating; NLB are undergoing feasibility studies with a view to applying for the associated grant funding.

4 Scope 3 emissions – whilst not currently included within GGC reporting, may be considered in the 2025 GGC refresh.

Phase 3 – Vessels and Marine Operations (inc Aviation Services)



NLB operate two Vessels NLV POLE STAR and NLV PHAROS. These multifunctional tenders between them undertake a range of buoy maintenance in addition to supporting all lighthouse operations, storing and capital refurbishment works.

Taking into consideration obsolescence, reliability, the requirement to operate in extreme weather, the aim to reach Net Zero and move to new generation fuels the POLE STAR Vessel Replacement Project is currently underway. This initiative will not begin to deliver tangible carbon reduction benefits until 2025/26 (beyond the current GGC reporting cycle). It does however contribute to a fundamental deliverable of NLB's journey towards Net Zero. NLV PHAROS due to be replaced in 2032. On shore power systems (cold ironing) will reduce the requirement for Marine Gas Oil to be used while the vessels are berthed in Oban, with battery storage also being used to enable a tCO2e reduction for vessel operations.

As the largest source of emissions, vessel use has been heavily monitored with team members setting up and leading a Scotland-wide group set up to examine Future Maritime Fuels; and operating behaviours focussing on efficient vessel use (eco-steaming) have been piloted and implemented via the Ships Energy Efficiency Management Plan (SEEMP) with positive results for both vessels when comparing 22/23 with 23/24.

Technological advancements in propulsion systems will provide a huge boost to NLB's targeted emissions reduction, and this technology is being keenly observed by NLB's Marine Operations Team.

Aviation Services

As the biggest user of aviation support NLB manage the Tri GLA Helicopter Contract on behalf of all three GLAs. Helicopter provision remains key to the GLA's operational service delivery underpinning

our core requirement to maintain AtoNs in line with statutory obligations and IALA Standards[5]. Helicopter services remain mission critical to NLB and based on figures from 2023/24, account for approx. 5.5% of our existing carbon footprint. The requirement to decarbonise this service will again be critical to our phase 3 carbon reduction efforts. The existing contracted service will be replaced commencing 2027 with a Tri GLA Aviation Services Project currently underway led by NLB.

List of further programmed non-AtoN Carbon Reduction Projects

- Installation of shore to ship power at Oban Base to facilitate Vessel Cold Ironing
- Maturity of Eco-steaming protocols to further optimise Ships Energy Efficiency Management Plan and associated Carbon reduction.
- Ongoing monitoring of future fuels feasibility and commercial availability.
- Delivery of new Aviation Services Contract in 2027 to take account of low carbon aviation fuels and technology in line with DfT Jet Zero aspirations.

Section 5 will provide details of the RoadMap to NLB's Net Zero Carbon emissions efforts.

4 Emissions Baseline and Projections

As the organisation has continued to gather data to meet the requirements of GGC, the emission sources have been reviewed.

- Waste – recognition that not all satellite depot waste had been included in baseline figures; NLB continue to work to identify all waste sources. In future this may also incorporate small project wastes that have previously not been included.
- Water – recognition that much of the water used by NLB is not metered; and is therefore an estimated value; this would be the case during the measurements for baseline, but with new understanding of the water consumption, future assumption would be inclusion of additional water use at 'other unmetered ports.'
- Energy – recognition that off grid energy production/ battery storage at AtoNs has not been included in baseline, or in recent reporting.
- Fugitive emissions – recognition that study to understand the fugitive emissions within the NLB estate were not gathered ahead of baseline reporting.
- Commuter travel – recognition that no carbon footprint has been associated with employee commuter travel, and impact of hybrid working.
- Home working – recognition that no carbon footprint has been associated with energy consumption through home working.
- Embedded carbon – recognition that only limited work has been completed to gather project specific embedded carbon, and no study has been undertaken to understand the impact from NLB historic building works, purchase of assets etc.

5 https://www.nlb.org.uk/wp-content/uploads/NLB-Guidelines-for-the-Management-of-LLAs-AtoN-2018-Document-1.pdf

The Scope of NLB current measured emission data is as follows.

Category	Subcategory	Main Source/s	Supplementary Source
Buildings Energy Use	Electricity Natural Gas Other Fuel (MGO in Lighthouses; renewable sources)	Data for GGC (current year)	Supplier billings based on meter readings; ships log fuel decant records
Travel Transport	Fleet/Hire vehicles. Vessels/ships Helicopter; Base plant (e.g. Forklift etc)	Data for GGC (current year)	Ships log Fuel consumption records, travel bookings, Car Hire Reports, Helicopter hours; Fleet records
Waste	HQ, Oban, Orkney, Shetland, Inverness Landfill/Recycling	Data for GGC (current year)	Waste transfer notes, weighbridge records. Logs
Water	HQ, Oban/Vessel, Orkney, Shetland, Inverness Supply	Data for GGC (current year)	Various methods, inc meter readings and estimates

NLB continue to comply with GGC reporting requirements[6] as set out by DEFRA, in addition to HM Treasury Sustainability Reporting Guidance[7], in order to enable effective data consolidation and verification in accordance with ISO 14001; and validation in accordance with ISO 14064. Attention is also given to changes being suggested by DeFRA, DESNZ and DfT to promote continued improvement of the data collection with respect to the GGC reporting requirements.

4.1 Carbon and Waste: The Carbon Metric

All carbon conversion factors are found on the Government website, so specific calculations can be conducted and are now being converted automatically using the Accuvio Reporting Database tool. Government conversion factors for company reporting of greenhouse gas emissions – GOV.UK (www.gov.uk) – links to all conversion factor reports past present, and future.

4.2 Future Carbon Foot-Printing: Organisational Process

Since 2021 the NLB team have started to record Grey Fleet mileage for RLKs (Retained Light Keepers) and work-related travel in colleagues own vehicles; these figures may be used in future reporting but were not included in the original baseline figures, so have only been included indicatively within the narrative. Waste and water consumption data is being recorded ad NLB continue to improve data collection for these (e.g. water metering, off-site water consumption; remotely located waste disposal; construction project waste). It is expected that these, along with other significant changes in the scope will be considered post 2025 reporting.

6 Greening government commitments: reporting requirements for 2021 to 2025 - GOV.UK (www.gov.uk)
7 Sustainability Reporting Guidance 2023-24 - GOV.UK (www.gov.uk)

Performance Context

It is also important to note that the data must be read in accordance with the qualitative narrative, as there have been events that have taken place which are out with the control of NLB, such as

- Availability of components due to worldwide shortages
- Impact of war/unrest (or other global/political events).
- COVID had an impact on performance during 2020/2021, with
  - hybrid office/ home working now a common practice at NLB.
  - This reflects in the data related to both building occupancy and their related impacts (i.e. increased energy use at home is not currently measured, emissions related to reduced commuter travel is also not being currently measured).
- NLB HQ undertook significant refurbishment and this required periods of low occupancy in Head Office between 2022 and 2024.
- New vessel replacement project is underway, and this has led to increased requirement to travel to the manufacturer's site (Spain) which will have an impact on international travel and associated emissions.

NLB's Carbon footprint is periodically reviewed where there are changes in operations, processes, equipment, plant and assets.

GGC Review – Implementation 2025

The 2025 GGC refreshed framework will be further developed over the next 18 months, with the commitments published in Autumn 2024, and the reporting framework and mechanism and guidance live before April 2025. The mission statement of the review is as follows:

"The GGCs 2025 refreshed framework will help ensure government leads by example on our climate and environmental commitments. It will increase the resilience of the Civil Service to a changing climate, and it will bring the GGCs in line with national government strategies, such as the Environmental Improvement Plan 2023 (EIP)[8] ."

The current stated aims of the review are to:

1. Review the existing targets and commitments and refresh them as needed to meet the policy intention. This includes agreeing level of 'ambition' for each target and commitment and reviewing strategically across operations.
2. Consider whether any additional commitments are needed to meet the policy intention.
3. Consider and make changes where necessary to: metrics, data processes, exemption criteria (who reports), baselines, guidance, implementation support, annual reporting approach.

The above approach may fundamentally alter NLB's baseline and performance however the organisation will continue to work in line with our stated aims and objectives in respect of decarbonising our assets and estate.

8 Environmental Improvement Plan 2023 - GOV.UK (www.gov.uk)

4.3 Projections and Business As Ususal

With adaptation planning initiated, there are a number of short, medium, and longer term decisions that NLB will need to make which may change the way the asset portfolio looks. Decisions based on scientific research – showing the potential for sea level rise and increased severe weather events – will have to be taken. These will be based on the organisation's requirements for maritime safety, risk appetite as well as the aspirations to comply with government targets for Net Zero Carbon emissions. Initial studies have been conducted, and results are available which show where work is required for the assets in NLB's portfolio. During 24/25 NLB will review the Climate Risk and Adaptation Framework (ARP4) from DEFRA to continue to review the future requirements of NLB's adaptation to climate change.

5 Carbon Management Projects

The phased approach to Carbon Emissions reduction and management is already detailed in the Executive Summary.

As discussed in Section 3.1 the GGC Project Tracker provides ongoing information on completed and ongoing projects across NLB which are targeting carbon reduction against our current baseline. The ongoing review of this Carbon Management Plan is an effective way to ensure that the GGC Project Plan is maintained regularly; and while many of the programmes on the plan are scheduled for years in advance, it is clear that these need to be visible and in the forefront of NLB's Corporate Planning in respect of medium to long term budgeting and investment.

6 Environmental Working Group

6.1 Introduction

In order to ensure that there is effective and ongoing ownership of the Plan, it is important to have a fully defined governance structure. This will be achieved via existing Governance Infrastructure referenced under item 10 Progress Reporting.

6.2 The Carbon Management Committee

Role	Role
HS&E Advisor	HS&E Assistant
HS&E Manager	Coastal Inspector
Risk and Improvement Manager	Planning Engineer
Business Improvement and Sustainability Coordinator	Electrical Projects Engineer
Mechanical Engineer	HS&E Advisor
Marine Operations Manager	Electrical/ Electronic Technician
Procurement Specialist	Assistant Management Accountant
Projects and Renewals Manager	

With the Environmental Working Group (EWG) in place, NLB have maintained an effective and ongoing ownership of their Carbon Management Plan. The EWG follow an agreed ToR and feed into both the GGC Workgroup and HSE Committee.

Some of the topics raised and investigated are itemised below.

- Eco steaming
- Purchase of electric vehicles
- Carbon Management Plan
- Removal of plastic and paper disposable cups
- Glass recycling at Oban
- Waste
- LED lighting now in place at Oban Base
- Rainwater harvesting
- Aluminium cans versus plastic bottles
- Installation of electric vehicle charging points
- Solar array at Oban Base for charging vehicles as a trial project.

This remains a highly dynamic working group consisting of a broad range of committed colleagues from across the business.

7 Progress Reporting

Carbon Management and Sustainability Reporting Framework

This framework has been established to provide robust and ongoing reporting and assurance at both the NLB and Tri GLA level. It links to the governance arrangements detailed within the Corporate Sustainability Framework and ensures that NLB's GGC performance is fully understood and assured by our committee and board level. In addition, this approach facilitates effective Tri GLA collaboration, best practice, and reporting.

Method Used for Reporting/Informing	Progress Reporting Frequency	Method
Annual Report and Accounts	Annually	Publication
Team Briefings	Biannually	Annual Staff Address and Performance Management Mechanism
Environmental Working Group	Quarterly	Report to Meeting
GGC Project Group	Quarterly	Report to Meeting
Health, Safety and Environment Committee	Quarterly	Report to Meeting
Governance Board	Quarterly	Assurance Statement via HS&E Committee
Department for Transport	Quarterly	GGC Report via Accuvio System
Tri GLA Sustainability Working Group	Quarterly	Tri GLA Report to Meeting
GLA Chief Executives Committee	Biannually	Tri GLA Report to meeting

Annual Report and Accounts, Tri-GLA Accounts validation and consolidation via the GLF Accountant provide a full review of the performance NLB are making in respect of GGC reporting requirements, including consumption and emission data.

The Carbon Management Plan will be reviewed annually to ensure that it remains 'fit for purpose' and continues to support corporate planning in respect of NLB's carbon reduction aspirations.

8 Initiatives and Case Examples

The following section has been developed to provide up to date data and performance information in relation to the aspects identified in each heading. Each section will provide current data and narrative in relation to current performance.

Section 9 will then allow the reader to understand the key emission sources with a view to providing timeline and roadmap to achieving net zero; or establishing where there are significant risk areas. Data has been taken from Annual Reporting and Accounts (AR+A) verified data; based on source data entered into the DfT reporting tool Accuvio with notes added as required.

8.1 Energy Efficiency & Renewable Power

Category	Baseline	2023/24	+/-%
Grid Electricity	688	374	-45.7%
Natural Gas	146	110	-24.7%

The natural gas emissions reduction may be attributed to implementation of air source heat pump in Oban, and the reduced attendance at HQ due to refurbishment and hybrid working. Electricity reduction from change over to LED lighting across all Oban Base and reduced office-based working will also have an impact. There is continued work on lighthouses/assets to reduce energy consumption across all buildings and assets. From 2021 to 2024 NLB were purchasing Renewable Guarantees of Origin (REGOs) to show that all energy purchased was from a renewable source; however this was NOT reflected in the governments carbon conversion factor; and given a significant increase in the cost of REGO imposed by the supplier a decision was taken on Value for Money, and the REGO payments were halted at end March 2024.

8.2 Transportation Alternatives and Travel/Transport

Annual emissions from Transportation (tCO2e)

Category	Baseline	2023/24	+/-%
Vehicle and Business Travel	106	95	-10.5%

Like for like data in the main reflects the reduction in non-operational domestic air travel, and the main replacement by rail travel. Reductions in car/van use support an overall reduction in travel and associated emissions. Fleet mileage from Electric Vehicle use (with 2 Electric Vehicles in NLB fleet during 2022/23 increasing to 4 during 2023/34) reduced fleet mileage from non-EV vehicles and the associated emissions also. Retained Lighthouse Keeper (RLK) and personal travel emissions were not counted in the baseline and have not been shown here, however this contributed to 17tCO2e during 2023/24.

8.3 Aviation Turbine Fuel

Annual emissions from Helicopter Use (tCO2e)

Category	Baseline	2023/24	+/-%
Aviation Fuel	313	273	-12.8%

As aviation fuel technology has not changed, the requirement for the use of the helicopter determines the hours flown and associated fuel consumption and carbon equivalent emissions; this indicator explains to us that the helicopter hours had decreased in relation to the baseline during 2023/24, however there are many factors that could reduce air miles; such as the periodic lack of availability of aircraft which may show a positive impact on emissions, but in reality is more related to an operational issue. Aviation emission cannot be influenced effectively without NLB participating in support of a technological transformation, seeking policy certainty and key infrastructure investment in the chosen aviation fuel technology. Progress of DfT Jet Zero programme is an area NLB will be keeping a keen eye on.

8.4 Vessel- Marine Gas Oil

Annual emissions from Vessel Fuel (tCO2e)

Category	Baseline	2023/24	+/-%
Marine Gas Oil	5295	4276	-19.3%

Decreases in MGO from Vessels are in the main acknowledged as being due to extended dry docking period for vessels, but a significant effort is also seeing MGO consumption rates per nautical mile reducing over time; attributed to the work completed by the Ships Masters and crew to Eco-steam as appropriate, to minimise the fuel consumption and reduce overall emissions. Intention during 2024/25 and beyond is to have full vessel fuel consumption data, trip information, nautical mileage to allow emissions to be calculated for individual journeys to AtoNs. During Q2 2023/24 NLB were approved to remove commercial emissions from their figures, and this is now formally invoiced back to the chartering organisation, however whenever possible eco-steaming procedures are also applied to work undertaken on a commercial basis.

8.5 Build Better

The Asset Management team and Programmes and Renewals team have identified and have budgeted for major works that are required to improve emissions from lighthouses. There is a documented Corporate Plan of works (2024-2029) and this is being tracked to ensure that works are being planned in accordance with the identified priorities for carbon reduction and Opportunity for Environmental Improvement is considered as a factor during work scheduling.

8.6 Waste Management

Update: 65 t of waste volume gathered in NLB 2023/24 includes 11tonnes of materials that are now collected for anaerobic digestion and energy recovery, this compares with 97 tonnes in 2017/18. This provides NLB with a recycling / recovery rate of 73% of current waste volume. Landfill content has been reduced by 62% in overall volume from 39.4t to 15t in that same period. The current landfill quantity is equivalent to 15% of the original total waste volume in 2017/18 and is 28% of 23/24 overall waste volume.

Work to define waste streams has taken place across NLB, but particularly at Oban Base, where new waste streams for mussels and food; and introduction of compactors to reduce number of uplifts and associated travel have contributed to the base reducing their emissions to approx. 40tCO2e; or a reduction of 86% of 2017/18 baseline emissions figure for Oban Base.

8.7 Water

Water figures are captured for Oban Base and HQ but estimated for the majority of the other stations and shore lights; offshore lights are supplied with water delivered from Oban, or other ports that can provide NLB vessels with water storage. Water at lights are already counted in the Oban water figures; estimates have been provided to capture typical consumption at Inverness/Orkney/ Shetland and at shore lights which do not have metered water supplies.

It is important to continue to monitor water use, and where we can improve accuracy of consumption levels, NLB will seek to do this. The proposed increased capacity of rainwater harvesting at Oban Base will support the push to minimise water consumption at the base, with the associated projected tCO2e savings.

8.8 Communication and Cultural Change

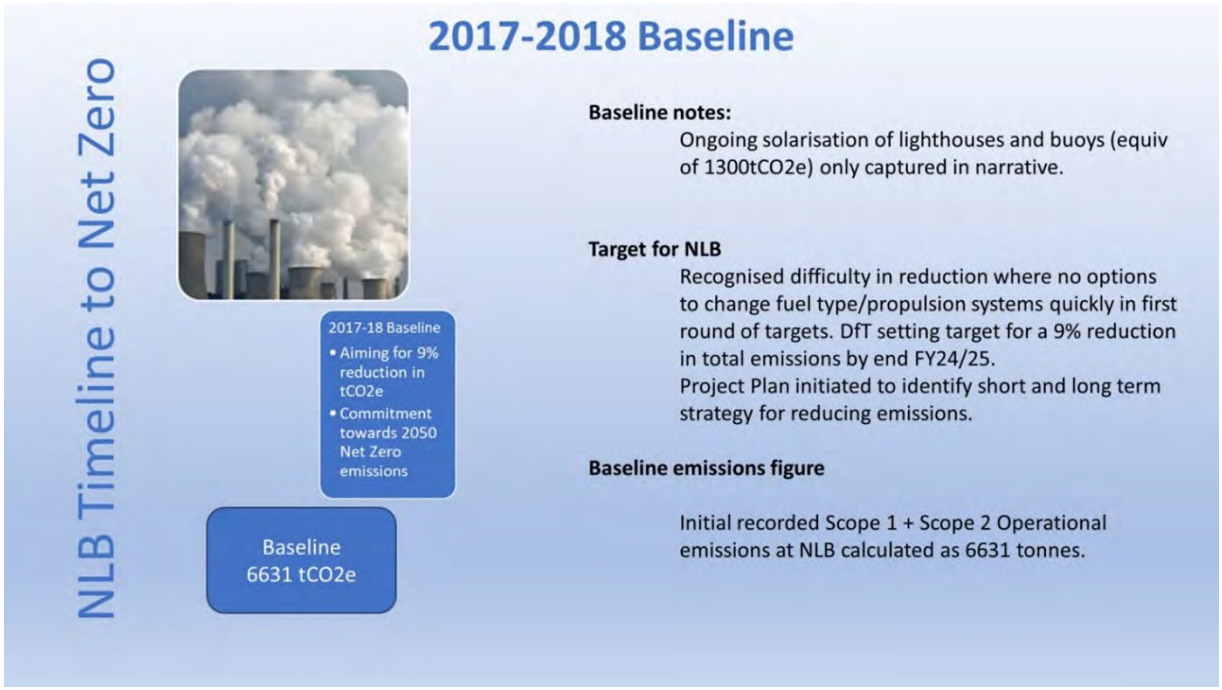
This Carbon Management Plan update will be shared with all staff and stakeholders. The embedding of the culture within NLB is tangibly supported by a Sustainability Website 'Our Journey to Sustainability' within the NLB online pages. This is a means to communicate our performance, good practice and other programme information that will help to enforce the values of the organisation and NLB's commitment to become a Net Zero carbon emissions organisation. Tracking information has been supported with engagement sessions for those with emissions reporting responsibilities to ensure that the data can be appropriately verified. Working Groups and Committees continue to propose sustainable innovations, and these 'staff suggestions' will be escalated and considered by the relevant senior management representatives, Directors, and Non-Executives. We continue as an organisation to leverage our performance management system which also incorporates a range of behavioural competencies relating to reducing environmental impact.

This sets behaviours at all organisational levels with the stated aim of:

- Demonstrating a commitment to the ongoing reduction of NLB's environmental impacts and enhancing organisational sustainability.

- Supporting NLB's commitment to become Net Zero as soon as practicable.

By looking at a projected roadmap to Net Zero, we can review the works planned or required in the 5-year corporate planning windows with the roadmap phases linked to Carbon Reduction estimates and risks to delivery. This will also allow it to tie in with the asset management plan.



Current year

2025-2030

2030-2037

2037-2050

The continuous review of the NLB Corporate Plan will look at decarbonisation through future purchasing and sustainable projects, as well as adapting to the projected climate change .

9 What We Know

Our carbon emissions at NLB have been reducing since solarisation began in the 1980's, and presently we are aiming for an ongoing emissions reduction in accordance with DfT targeted emission reduction targets; this of course meant that the pattern of our energy consumption altered dramatically during this time; leaving us with the following breakdown of our carbon emissions in the baseline year.

9.1 Vessels (Approx. 80% of Total Emissions)

The progressive removal of conventional fossil fuel technology at AtoN's, reducing the energy consumption from these assets has placed significantly more scrutiny on the impact that the current fossil fuel used in NLB's vessels Pole Star and Pharos. The vessels now make up approx. 80% of the organisation's total carbon equivalent emissions.

NLB are making improvements to their fleet; the new Pole Star vessel will be a hybrid vessel and will be able to charge and store energy to support its operating requirements. It is also designed to accommodate a midlife refit to facilitate the installation of future low emissions propulsion technology.

For 2050 – to be Net Zero Carbon – capacity for works to be undertaken must include the use of vessels that are running at Net Zero, currently the plan is that NLB will have 2 vessels in service with a capability to do this.

Risk areas:

Technology – infrastructure to supply necessary volumes of fuels for the vessels at appropriate locations. Encouraging news in Aug 23 that Port of Nigg have entered into an agreement to allow them to create Green Methanol from CO2 emitted from renewables industry. A change to a greener fuel type in vessels would significantly reduce NLB's CO2 footprint (reusing CO2 as product/ reduced carbon equivalent emissions); this could enable vessel fuel to run close to Net Zero. (Current carbon conversion rate for Green Methanol is that a tonne of Biomethane/e-methanol will emit 5kg of CO2e; compared to Marine Gas oil where a tonne of MGO will emit 3245kg (or 3.25t) of CO2e.)

Technology –POLE STAR will run on Hybrid electricity/ diesel from 2025; PHAROS replacement vessel will not be available until 2032 (tbc) and again will run on a hybrid mix of fuel. If continued use of diesel with the new vessel – this will leave a significant emissions deficit; if running on green diesel the impact will be significantly reduced, and for hydrogen/methanol powered vessels or other green alternatives the impact could result in the required Net Zero emissions.

Legislation/standards - Potential requirement to respond to Emissions Trading Scheme in UK for Maritime vessels; which can be seen as an opportunity or a risk; since a lot of the work to reduce emissions by the organisation has already been implemented/ planned; so difficult to see if this would be of monetary value to NLB or become a financial risk. The industry also await fuel standards and regulation before fuel manufacturers are likely to invest in innovative technologies without the guarantees and continued uncertainty in the fuel market.

Behaviours – Eco steaming will support the reduced use of energy on all vessels; and should support in minimising fuel use.

What is required to be Net Zero?

Likely there will be some outstanding tCO2e emissions created; Electricity (from renewable sources) - Carbon impact of the project build; Continued use of marine gas oil (MGO)/ or greener alternative and the accompanying carbon impact; Embedded carbon from the new and existing technologies; and scope 3 emissions from supporting works for vessel builds/ infrastructure builds. May require involvement in government emissions trading schemes or offsetting which will become clearer when understanding of the future fuel standards and selected maritime fuel sources becomes available.

9.2 Transport Fleet and Travel (Approx. 2% of Total Emissions)

4 of NLB'S 16 vehicle fleet are currently EV (FY 23/24);

Risk areas: Remote infrastructure currently not available; even at Oban base there had been challenges in finding contractors willing to instal EV infrastructure; and the cost has been reviewed as prohibitive to change.

Legislation/ GGC reporting requirements to have all Government and ALB fleet as EV by Dec 2027. What is required to be Net Zero? Reducing domestic and international air travel, while replacing remaining vehicle fleet with EV; installation of charging points at road end shore lights; replacement/ review of energy consumed by other plant/ equipment (at Oban Base/ HQ and other bases/stations). Likely outstanding tCO2e: Vehicle replacement plan has been created by the Asset Management team, but already there has been an acknowledgement that to supply 'operational vehicles' these would need to be 'hybrid' as the infrastructure in remote areas is not reliable at this time. This will require further review to understand what else can be done to decarbonise travel options at NLB.

9.3 Lights (Approx. 1% of Total Emissions)

NLB have ongoing plans to further optimise their AtoN estate in carbon reduction terms. Many lights are either supplied from National Grid or have solar powered capability. 22 stations have diesel generators in place for battery charging, cycle charged, or as back up to solar power due to their geographical position and available daylight; such diesel electric stations are being upgraded to provide for next generation hybrid diesel electric technology. A pilot of replacing diesel with Hydro Treated Vegetable Oil (HVO) is to be undertaken in 2025 there will be a 90 % reduction in life cycle greenhouse gas emissions, a 33 % reduction in particulate matter, a 24 % reduction in carbon monoxide, and a 9 % reduction in nitrous oxides a significantly better option than fully utilising MGO

Risk areas:

A full review will be required to show where it is not feasible to have 100% renewable/ green based alternative fuels at ALL lights. For welfare/ emergency purposes there may require to be limited fossil fuel electricity generation for power, heat, and light (at some Pillar rocks for example) – this will need to be confirmed by NLB's Project & Renewals and Asset Management Teams. Also questions around availability of greener fuels, and safe storage onshore.

Meanwhile there is still a limited risk while NLB host remaining FM200 fire suppression systems across 10 lights; with a recent system release contributing heavily to carbon equivalent emission levels during that period. These systems will be fully removed between 24/25 and 27/28.

What is required to be Net Zero?

Likely outstanding tCO2e : Unlikely to have fully changed across to greener fuels for generators for all lights; albeit HVO option may be a suitable alternative to MGO after a pilot programme is initiated.

9.4 Satellite Depots/Workshops (Lesss Than 1% of Total Emissions)

Smaller bases at Inverness, Orkney and Shetland each have their own carbon footprints, which albeit does not significantly impact the overall carbon emissions figures but will require to be managed in a similar way to that of the Oban base.

Risk area:

Value will need to be understood, where cost will be a factor in all improvement programmes, and it is important to understand from the bases where we have low cost, high value (decarbonisation) projects prioritised, while continuing to address the other emission sources.
Consistency in collecting the appropriate base data is also an area for attention; as waste, water and resource is managed, it will require to be logged appropriately and associated emissions recorded and calculated for NLB.

What is required to be Net Zero?

Likely outstanding tCO2e: Vehicles linked to the bases require replacement programme; electricity/ gas use should be from renewable sources where practicable, part of a Power Purchase Agreement (PPA) or consider alternative air source heat pumps etc. Electricity carbon emissions conversion factor should reduce over time as UK grid increases renewable energy in the grid making it the primary energy source for UK. Waste totals and final destination for wastes (landfill/ recycled) will dictate their associated local emissions figures.

9.5 Oban Base (Approx. 1-2% of Total Emissions)

Oban base is NLB's flagship site for championing Net Zero Carbon, with a decarbonisation plan identifying a number of options that will take the base closer to Net Zero; Air source heat pumps replaced a gas powered boiler; and replacement project will continue as the other boilers age; LED lighting is installed across the site replacing previous high consuming bulbs with the operational times of LED lighting reduced via passive infra-red (PIR) motion detection helping reduce power consumption, costs and damage to insects; and rainwater recovery, solar power and food waste management have all been piloted successfully by the team.

Risk areas:

What remains to be done? Excluding the vessels there are still vehicles and mobile plant / craneage across the site which are moving towards EV replacement. Noting previous challenges related to the geographic feasibility of operating EV vehicles in north-west of Scotland, NLB are currently planning for installation of EV charging infrastructure at Oban base.
What is required to be Net Zero?

Likely outstanding tCO2e: Zero – it is realistic that Oban base can achieve net zero carbon emissions within the 2045-2050 timescale, if enabled to take advantage of some of the financial support schemes available to Civil Service ALBs for the purposes of decarbonisation.

9.6 HQ (Approx. 1-2% of Total Emissions)

Major refurbishment works at Edinburgh HQ have allowed a recent review of the Building Management inclusive of the energy consumed through heating, electricity, and lighting as well as the source of waste volumes. Significant work has been completed (Jan 24) to install effective work areas which now benefits from more efficient and effective lighting and heating sources. Ongoing hybrid working will maintain a lower energy footprint for the building, and water use/ gas consumption/ paper consumption remain low, but these will require to be monitored when colleagues are returning more regularly to the building from 2024 onwards.

Risk Areas:

The building is approx. two hundred years old. This itself presents some limitations in how effective energy saving measures can be. There is also significant electricity consumption with internal data servers.

What is required to be Net Zero?

Likely outstanding tCO2e: Building Management Systems should provide details of areas that can be improved in terms of 'use' but to allow the HQ to become a Net Zero Carbon location may be reliant on the availability of sourcing an effective supply of renewable electricity from the grid through PPA schemes.

Appendix A
How NLB can get to Zero Operational Emissions by 2050

The following emissions savings are projected for NLB based on Corporate Plan and known works that are pending. This is not an exhaustive list, but full details of projected emissions savings can be followed in Corporate Plan and supporting NLB reports.

	Performance (tCO2e)2023/24	**Baseline operational (tCO2e) 2018**
Electricity (inc transmission/ distribution)	374	688
Gas	110	139
Vessel Fuel (Pharos)	3009	3530
Vessel Fuel (Polestar)	1266	1765
MGO (Lights)	76	116
Aviation fuel (Helicopters)	273	311
Transportation	111	82

Activities leading to highest emissions savings:

Source	Emission Reduction Activities	Saving	Timeline
MGO (Vessels)	Future fuel inc VRP Pharos;	4,000+ tCO2e	2037 (TBC)
Electricity	PPA option? (Zero Emission Power Purchase Agreement)	827 tCO2e; risk of increased consumption with Shore to Ship Power and EV fleet	2024 – future options TBC.
MGO (vessels)	VRP Polestar; inc ship to shore power; and eco steaming behaviour	200 tCO2e	From 2025/26
MGO (lights)	Various refurb (inc Pillar rocks (LED, removal of diesel generators)	Approx. 20tCO2e	From 2023/24-36/27
Transportation	EV vehicles (Full EV/ hybrid)	Approx. 20tCO2e	From 2023/24 to 26/27
Fugitives	Removal of FM200 Fire suppression; understanding other fugitive sources.	Removes or manages risk – no direct saving	2026/27

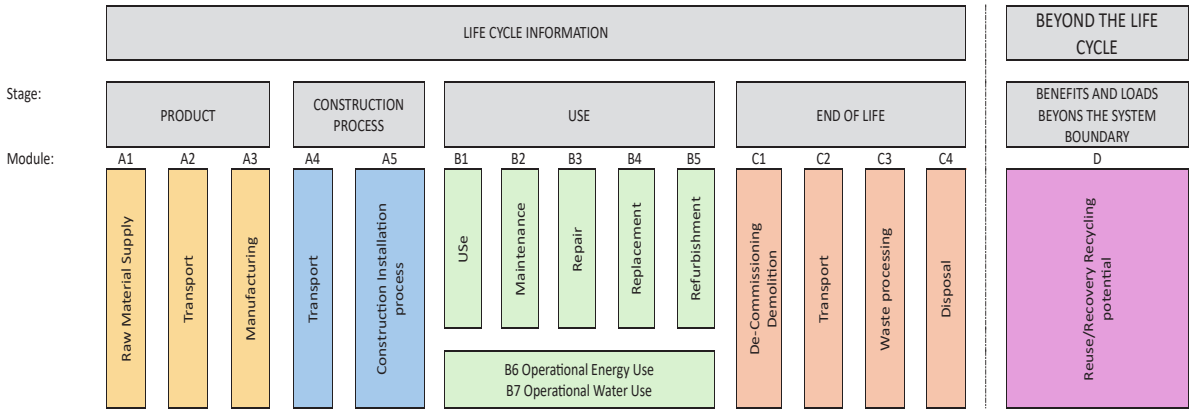
The remaining NLB emissions would come from the followng. Additional work would be be required to reduce these.

Source	Remaining (Est)	Additional Activity
Aviation Fuel	311 tCO2e	Future fuel source
Transport (inc car and flight use)	66 tCO2e	Minimise non-operational travel, inc flights
MGO (Lights)	39 tCO2e	HVO/ alternative

Current projection could see an emissions reduction of approximately 93.73% from 2018 baseline.

Appendix B.1
Measuring Embedded Carbond and Accounting for Carbon from Projects

While current GGC reporting does NOT include a requirement to report on embedded carbon, it is clear that all parties involved in production/construction must be aware of and plan to manage the emissions that are created during raw material recovery, transport/delivery pipeline, manufacture, construction prior to operational phase; and also to recognise the post operational emissions from waste management and decommissioning.



While it is recognised that currently the UK government have not introduced guidance to support Carbon Lifecycle accounting and reporting, (1) to encourage industry to use low carbon materials and to produce more efficient, low-carbon designs – future reporting will be required.

At NLB the initial stage for understanding our embedded carbon footprint is to work with 3rd party manufacturer during the vessel replacement project (VRP) and recognise the data is available to assess. Already Gondan (the selected contractor for the Polestar VRP) have provided a brief independent report advising of the carbon footprint for the main constituent materials of the build; which supports NLB to prepare themselves to implement project based embedded carbon reporting.

While there is no mandated method for collecting and measuring embedded carbon, the Institute of Structural Engineers (iStructe.org) have published supporting information which can be used to begin to understand our future requirements.

To receive the data necessary to undertake embedded carbon studies, the supply chain must be mandated to provide this data. The ability of organisations - such as NLB - to address this is limited (contract by contract) unless 3rd party supplied carbon emission data is made compulsory by law.

Appendix B.2
Circular Economy
Sustainable Procurement Policy

Created and released in October 2022 this Policy recognises the need to achieve ongoing and continuous improvement against the context of the three pillars of sustainability relating to Societal (Social and Human), Economic and Environmental factors. The Procurement Team continues to review all contracts and relevant purchases to ensure that the Sustainable Procurement Policy is effective.

NLB work to assess operational emissions in accordance with GGC requirements has improved overall the organisation's appreciation of the future need to recognise and consider the full lifecycle carbon impact of the assets and services we provide. To date the GGC has only required operational emissions data, but in future this will also include the emissions that fall under Scope 3, indirect emissions – from their procurement choices, sourced materials, contracted partners, including ascertaining the correct consistent method for measuring embodied carbon. NLB have made considerable progress in relation to their VRP with regard to the implementation of Procurement Policy Note (PPN) 06/21 and have gone over and above this requirement with work ongoing to establish and validate a method of establishing the carbon footprint for the NLV POLESTAR vessel build (incorporating embodied emissions).

See also

2023 Carbon Management Plan inc Embodied Carbon.xlsx

(1)Building to net zero: costing carbon in construction: Government Response to the Committee's First Report - Environmental Audit Committee (parliament.uk)

How to calculate embodied carbon (Second edition) - The Institution of Structural Engineers (istructe.org)

Northern Lighthouse Board

MarineServices

Over 200 years of service to the mariner

Our primary function is to carry out our statutory duties providing Aids to Navigation (AtoN) for the safety of the mariner. When we have spare capacity in our statutory programme, the Merchant Shipping and Maritime Security Act 1997, allows us to offer marine support services to clients. As the most experienced provider of AtoN services in Scottish and Manx waters, find out how we could support you.

Vessel Hire

Equipped to levels normally only found in much larger vessels, NLV PHAROS and NLV POLE STAR provide versatile platforms for buoy handling, marine research, sea trials, hydrographic surveying and other marine support services.

Buoy Services

Whether you need to mark a port approach, marine renewable energy site or a decommissioned oil rig, we can provide a temporary or permanent AtoN solution. Our commercial buoy services include rental, inspections, maintenance and refurbishment. NLV PHAROS and NLV POLE STAR can also assist with deployment and removal.

Marine Base Support

NLB Oban offers full marine base support facilities, including berthing services, buoyage preparation and supply, and workshop services.

The Northern Lighthouse Board is Certificated to:-

- BS ISO 45001:2018 Occupational Health and Safety Management System
- BS EN ISO 9001:2015 Quality Management System
- BS EN ISO 14001:2015 Environmental Management System
- BS EN ISO/IEC 27001:2013 Information Security Management System

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