

**2024
IMPACT
REPORT**
BLUE FRONTIERS

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CEO STATEMENT

“COP16, the EU Nature Restoration Law, and the UK’s Biodiversity Net Gain Policy have brought biodiversity to the global stage like never before. With an estimated one million marine species at risk of extinction due to human activity and climate change, there has never been a more vital time to focus on protecting and restoring life beneath the waves.

“This year marks the fourth edition of our annual impact report – a moment to reflect on ARC marine’s role in advancing sustainability, biodiversity, and material innovation. These reports are essential in keeping us transparent and accountable, and they support our mission to accelerate reef creation at a scale the world has never seen.

“Amidst the often bleak news around environmental degradation, we see real reasons for optimism. In 2024, we surveyed our first offshore wind farm, featured in episodes of the BBC’s Changing Planet and Countryfile, and launched the draft of PAS 1401:2025 – a new Publicly Available Specification that sets the standard for designing, installing, and managing nature-inclusive marine structures.

“There’s still much to be done, but we’re committed to our mission and proud to share the impact our technology has made over the past year.”

- Tom Birbeck, Founder and CEO





WHO WE ARE

ARC marine is an award-winning eco-engineering company that brings nature-inclusive solutions to traditional marine industries.

Based in the UK but delivering globally, the company specialises in designing, manufacturing, installing and monitoring subsea protection structures in order to enhance and monitor biodiversity.



OUR CORE VALUES

ARC marine specialises in designing, manufacturing, deploying, and monitoring nature-based solutions and their mission is to accelerate reef creation around the world.

We believe that building with nature-inclusive designs in mind is one of the most powerful ways that we can enrich marine biodiversity. We're working toward that as a company and we wouldn't be where we are today without our teams of dedicated scientists, engineers, conservationists and all-round ocean-lovers.

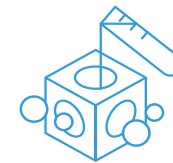
As we continue to push forward in our mission, our core values represent the pillars the we use to guide us in how we go about this. They are: Hands-on, Eco-centric, Science-driven and Innovative.



Hands-on



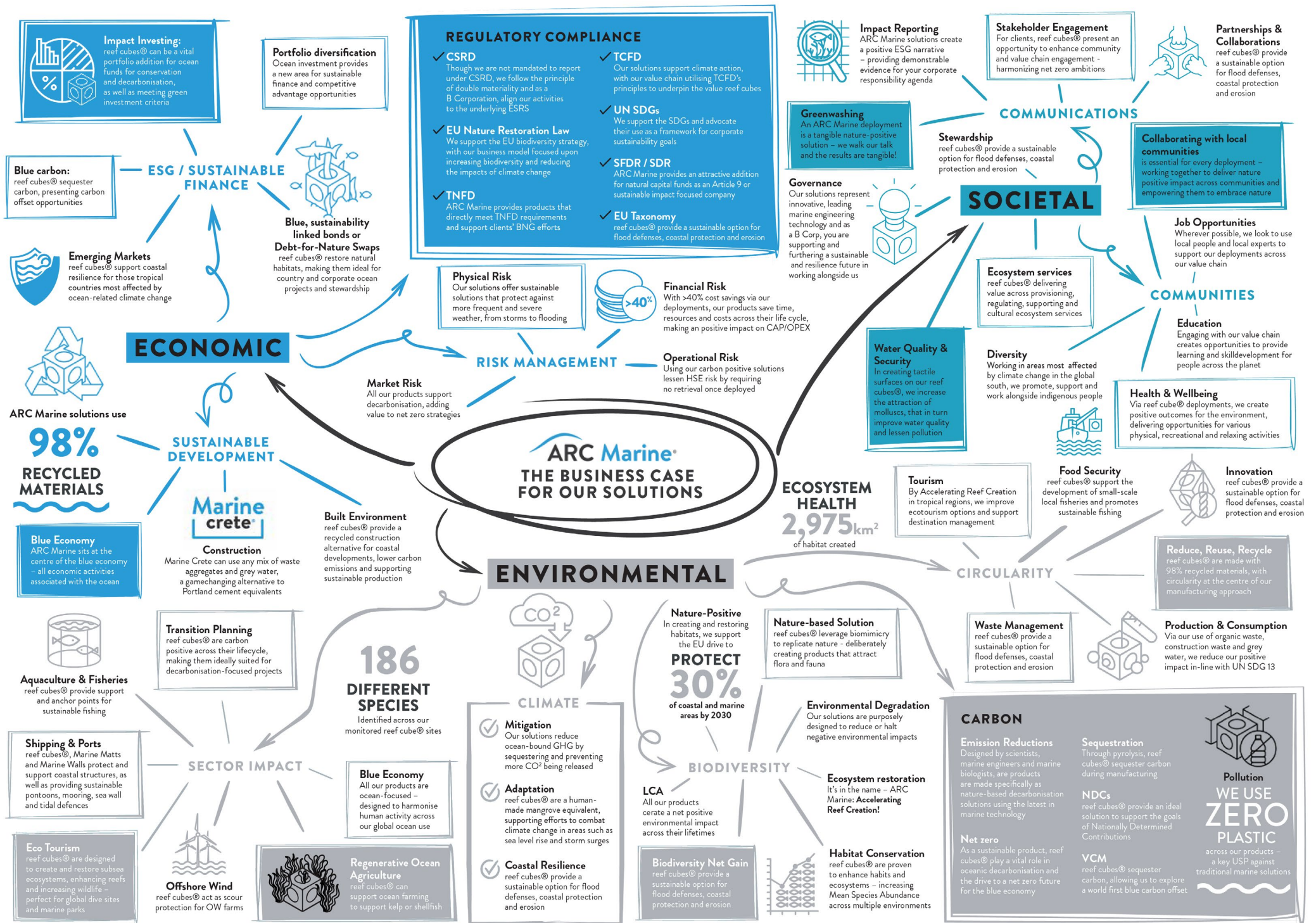
Eco-centric



Science-driven



Innovative



OUR VISION

We want to repair the world's damaged marine ecosystems on an unprecedented scale.

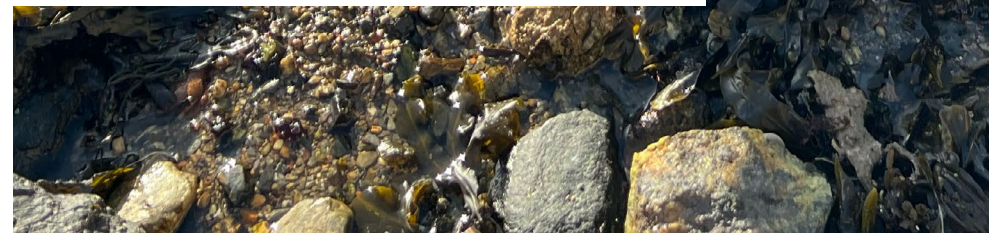
We're doing this by incorporating eco-friendly artificial reefs across the globe where they not only enhance biodiversity, but they serve as subsea protection, coastal defences, moorings, marine foundations and more.

We are optimistic and believe that by solving conventional marine problems with our plastic-free, low-carbon technologies, we allow a variety of industries to leave a lasting positive impact on the marine environment.

A key sector that provides unprecedented opportunities to leave a positive sustainable impact is in offshore construction. As offshore wind sees an intense and rapid scaleup, we see the chance for a thriving reef at the base of every turbine, which can be achieved with our nature inclusively designed scour and cable protection.



**IMPROVING THE
WELL-BEING OF
OUR OCEANS, NOW
AND FOR FUTURE
GENERATIONS**

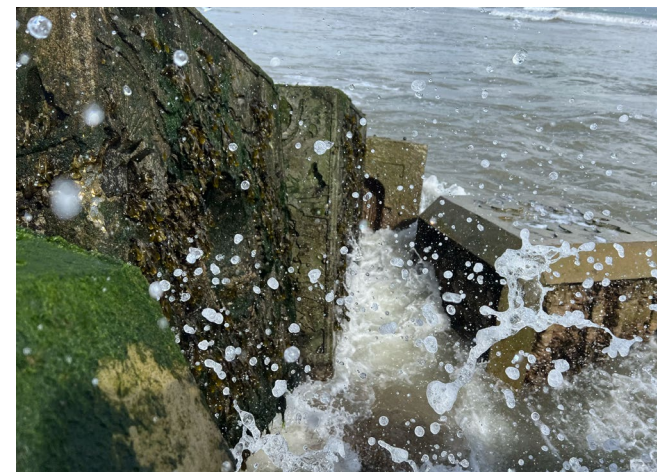


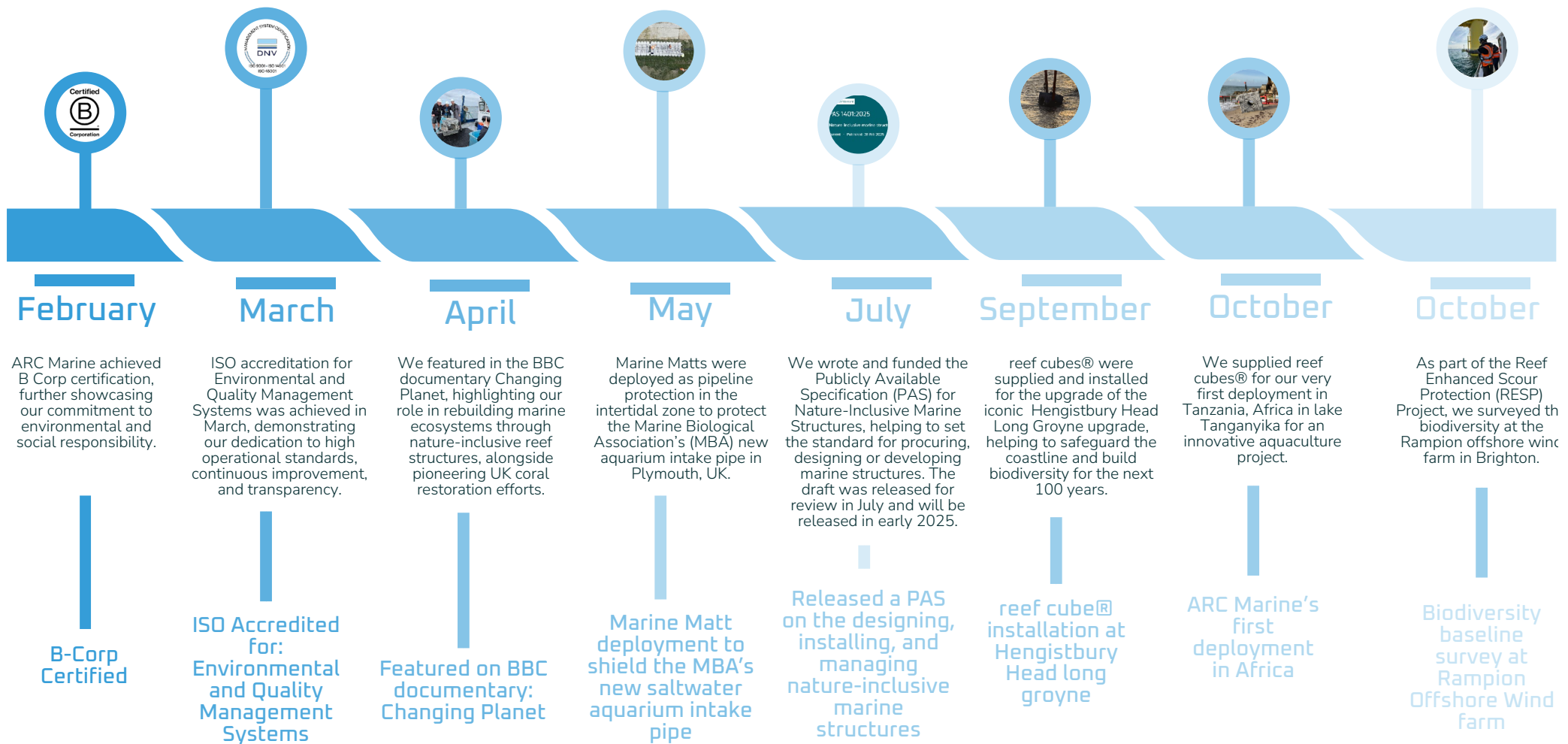


2024 TIMELINE

2024 has seen ARC marine expand its impact across new geographies, reinforcing our leadership in eco-engineering and Nature Inclusive Design (NID). From our first deployment in Africa to installations closer to home in Falmouth and Hengistbury Head.

This year also saw us release the draft of PAS 1401:2025, achieve ISO accreditation, and become B Corp certified – major milestones that reflect our commitment to quality, sustainability, and transparency. With biodiversity surveys, new partnerships, and national media features, we're proud to be setting the standard for designing, installing, and managing nature-inclusive marine structures.

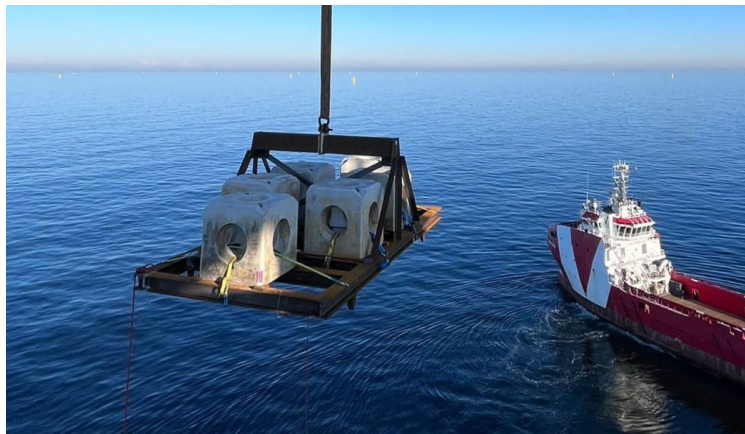




2024 OVERVIEW

Globally, 2024 has seen major strides in marine biodiversity, with growing recognition that biodiversity is the missing link in effective climate action. This shift is evident in the expansion of Marine Protected Areas (MPAs) worldwide and the introduction of landmark legislation, such as the EU Nature Restoration Law and the UK's Biodiversity Net Gain (BNG).

At ARC marine, marine biodiversity loss has always been a pressing issue and this year, we have reaffirmed our commitment to restoring it, guided by our core values. We've placed a strong emphasis on being eco-centric, with sustainability as our compass. Our progress is reflected in the milestones we've achieved in 2024 - including securing ISO accreditation and attaining B Corp certification.



DEPLOYMENTS

One of our most noteworthy installations this year was the deployment of Reef mats as pipe protection in the intertidal zone in Plymouth, UK. These were installed to safeguard and enhance biodiversity at the newly replaced seawater intake pipe for the Marine Biological Association's (MBA) renowned research aquarium. We also saw Reef cubes® deployed to enhance biodiversity at the iconic Hengistbury Head long groyne, as part of a broader coastal defence upgrade.

PUBLICATIONS

In 2024, ARC marine played a key role in developing the draft of PAS 1401:2025 – Nature-Inclusive Marine Structures: Code of Practice (set for publication in 2025). These innovative guidelines outline how to design, install, monitor, and decommission marine infrastructure in ways that promote biodiversity and ecosystem resilience. From offshore developers to policymakers, it's aimed at a wide range of stakeholders and provides a clear, science-based framework for integrating nature-inclusive design into marine projects. Our involvement mirrors our position as pioneers within the industry.

CONTRACTS

2022 saw us secure £3.4million in funding as part of our Reef Enhanced Scour Protection (RESP) project. The funding was provided by European Innovation Council (EIC) and Mulago and will allow us to research and take to scale our low carbon, biodiversity enhancing subsea protection for the offshore wind industry.

KEY STATISTICS: 2024



18 TONNES
of CO₂ saved



197 TOTAL SPECIES
found on Reef cubes®



106 TONNES
of recycled materials utilised



67 REEF CUBES®
installed

NET ZERO

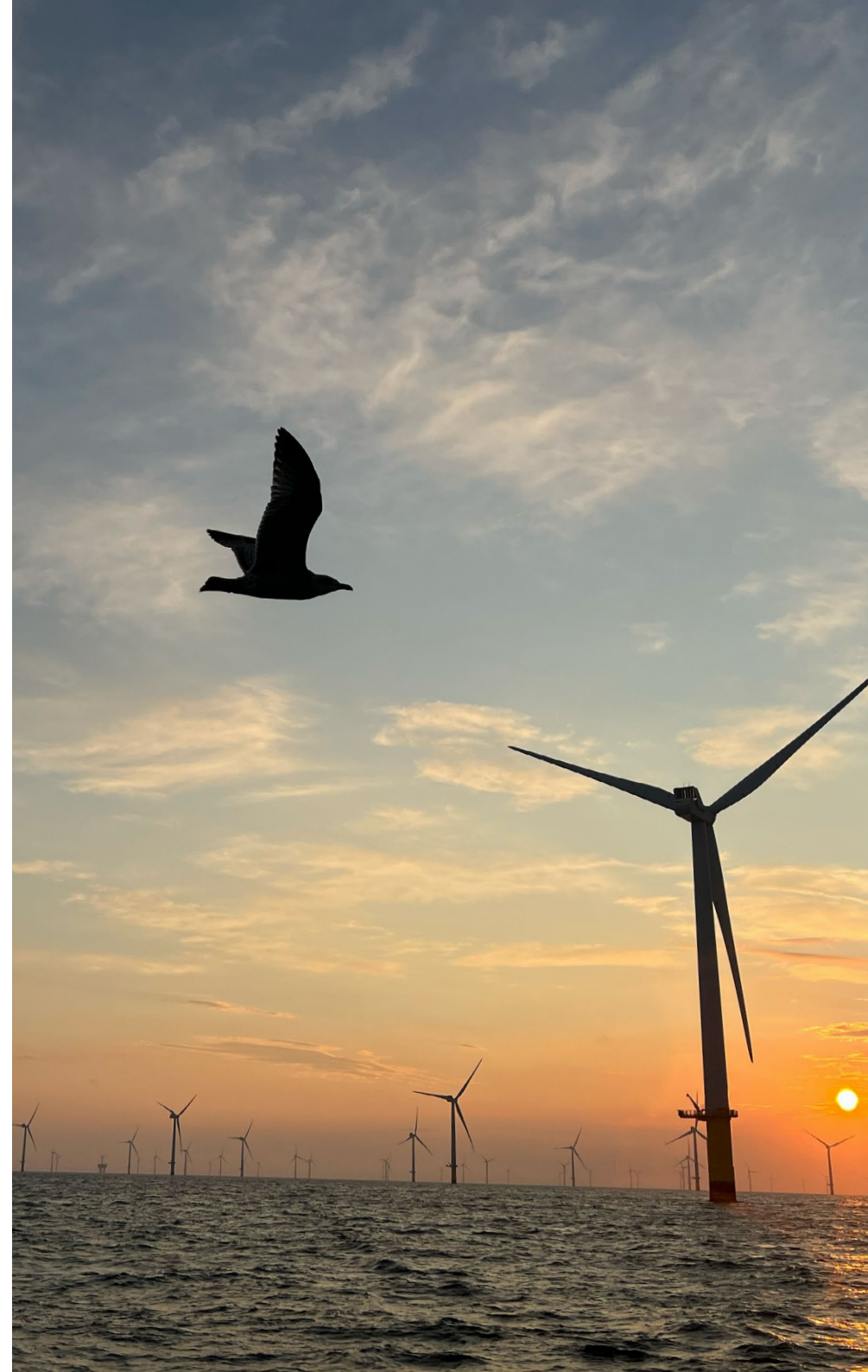
The climate crisis and biodiversity loss continue to be pressing global challenges, marked by rising sea levels, increased surface temperatures, and higher ocean acidification.

While the Paris Agreement aims to limit global temperature rise to 1.5°C and the EU has set a target to achieve climate neutrality by 2050, it is clear that accelerated action is essential to reach net-zero emissions and to halt the ongoing decline in biodiversity.

In 2023, significant progress was made towards global biodiversity conservation. The Conference of the Parties to the Convention on Biological Diversity (COP15) in Montreal concluded with the Global Biodiversity Framework, which, among other commitments, aims to protect 30% of the planet's land, coastal areas, and oceans by 2030. This ambitious framework underscores the urgent need for integrated approaches to climate and biodiversity challenges.

At ARC marine, we recognise the imperative to lead by example and this year, we made notable strides with the further development of our carbon-neutral Marine Crete mix. Our products are also designed to remain in place beyond their operational life, contributing to long-term carbon sequestration as they naturally integrate into and support evolving ecosystems.

Looking ahead, we are committed to developing our own offsetting projects beneath the surface. Our future initiatives include protecting the seafloor and establishing valuable seagrass beds. These efforts are aimed at enhancing carbon storage and providing critical marine habitats.



UN SUSTAINABLE DEVELOPMENT GOALS (SDGs)

At ARC marine we anchor our sustainability strategy to the SDGs, with UN SDG-14, Life Below Water, as the mainstay.

With a rapid scaleup occurring, the offshore wind sector is one of our most crucial markets and its growth allows us to help the world manage its growing need for renewable energy with our responsibility for our marine environment.

Our subsea protection for offshore energy includes cable and pipeline protection, as well as scour protection for the turbines' monopiles – all of which can stay in situ indefinitely, unlike conventional protection which is required to be removed via a costly, timely and CO₂-intensive process.

We're creating solutions that can enhance not only the sustainability of every marine project but also biodiversity through our nature-inclusive designs which protect assets while creating a sustainable eco-friendly habitat for an abundance of marine life. Our long-term eco-system impact monitoring will allow informed decision-making and a science-led approach to healthier and sustainably productive oceans.

ARC marine's other technology is focused on solutions for the marine environment, including coastal defence, aquaculture and eco-tourism.

THE MEANING OF IMPACT



SECTORS & INDUSTRIES

Our solutions provide numerous environmental benefits designed to produce a positive impact above and below the surface. Aside from it being the right thing to do, creating products that are safe for the environment is paramount for us. Across our key sectors, we look to be a point of environmental difference in the following key industries:



AQUACULTURE & FISHERIES

Our planet requires more sustainable sources of food to feed a growing population – our oceans are currently over-exploited and, in some areas, fished out. Aquaculture is the controlled production of marine species, with the aim of providing managed food stocks

In supporting aquaculture, we provide solutions that create, support, improve or restore habitats. Particularly suited to Brown Crab, Native Oysters and European Lobsters, fin fish and sessile organisms our Reef cubes® have proven to be an effective ally in sustainable marine farming, with deployments such as REFAS 2 exceeding expectations and having the added bonus of creating an defacto marine protected area, with the size of the cubes deployed rendering the area untrawable.



HABITAT RESTORATION

As you may have guessed... we design in harmony with nature. This underpins our philosophy – all ARC solutions must be nature-inclusive, bring about positive impacts, do more good than harm and be able to be left indefinitely. We're proud that our technology meets this criteria (unless interfered with by human activity of course) and all future solutions will too – that's why we're a global pioneer in marine innovation. Our mission from day one is to accelerate reef creation (ARC) and this is still our focus. Through the improvement of habitats and ecosystems, we can deliver a breadth of benefits from biodiversity enhancement to sediment stabilisation.

Our solutions have proven highly adhesive for molluscs (which are often the first species to move into an area) and provide shelter for species to live safely and multiply. Using the latest in biomimicry, we can adapt our deployments to suit most environments and thus mirror most species' requirements.



OFFSHORE ENERGY

Protecting offshore wind installations from scour and erosion, providing eco-friendly moorings, protecting cables and pipelines – our benthic solutions are the most efficient in the world for subsea support. Being 90% lower carbon footprint*, plastic free and comprised of 98% recycled materials, we can support any subsea infrastructure, globally.

Once deployed, our solutions can be left indefinitely – a major win for us is to let nature take its course. Once deployed, our Marine Crete will not leach toxins, meaning our solutions are a great option for subsea infrastructure which instead of being recovered via a costly and damaging decommissioning process, can simply be left to be taken over by various species - leaving a living legacy, owned by nature. Subsea infrastructure can also be left with regulator consent.



COASTAL PROTECTION

With a strong emphasis on climate, we're well aware of the dangers of aspects such as rising sea levels and extreme weather. Being a coastal business on an island nation, the necessity to protect our coastline is obvious to us and something we designed our solutions to support. If we can mitigate the impacts of climate change around our coast, we are giving the environment a chance to adapt to future state scenarios, as well as helping to stave off the potential costs to coastal towns, cities and infrastructure through nature-based protective barriers and mitigating the aforementioned dangers sufficiently to aid longer term solutions to provide longer term solutions that contribute to economic and societal benefits to be put in place, contributing to economic and societal benefits.

ENVIRONMENTAL PERFORMANCE

We enlisted the support of Devon's leading carbon footprinting and certification, Blue Marble. With their expertise, we have been able to determine our foundation carbon footprint based upon an assessment of our activity in 2023. This was important for us as it provides not only a baseline with which to demonstrate progress, but in using an independent, local business to conduct our assessment, we are playing our part in promoting regional leaders and providing income to our regional economy.

At a high level, Blue Marble has determined that ARC marine greenhouse gas footprint comprises the following emissions:

(See Overall Emissions Chart)

- Total Scope 1 emissions were calculated to be 16.10 tCO_{2e}. The major direct emission was the use of company vehicles;
- Total Scope 2 emissions were 9.10 tCO_{2e}. No heating or electric was directly purchased. Rental property energy is included in Scope 3;
- Total Scope 3 Emissions were 52.70 tCO_{2e}. The majority of Scope 3 emissions were from the energy associated with the warehouse and laboratory rented properties

Total included emissions for the subject were 77.94 tonnes.



RESULTS

SUMMARY OF RESULTS IN GREEN HOUSE GAS PROTOCOL FORMAT

Activity	Scope 1				Scope 2				Scope 3	Outside of Scopes
	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O	kg CO ₂ e	kg CO ₂ e
On-Site Activities										
On Site Liquid Fuels	5038	4972	1	66					1225.1	321
Company Controlled Vehicle Mileage	929	923	1	5	0	0	0	0	239.9	59
Off site fuels / Energy										
Company Controlled Vans & Logistics	10160	10093	0	67	0	0	0	0	2488.3	728
Provided Electrical, Heat or Cooling Energy					4516	4470	20	27	1486.8	
Supplied Energy					4597	4552	28	17	1047.1	
Energy - Premises by m2										
Hotels									2488.9	
Public Transport									20849.1	
Business Travel									5076.8	239
Personal Car Mileage										
Upstream - Inbound Delivery and Freight									1730.9	
Freight and Logistics									3266.5	
Upstream - Sold Product Delivery and Freight										
Waste									22.9	
Waste Disposal										
Purchased goods & Services									17.4	
Water Usage									2766.4	
Employee / Contractor Working from Home									9995.9	
Commuting										
TOTAL GHG EMISSIONS kg CO₂e	16128	15987	2	139	9113	9021	48	44	52702.0	1346
TOTAL GHG EMISSIONS tonnes CO₂e	16.1	15.99	0.00	0.14	9.1	9.02	0.05	0.04	52.7	1.35
TOTAL tCO₂e	77.94									

PARTNERSHIPS

WE ARE PROUD TO WORK WITH VARIOUS COLLABORATORS AROUND THE WORLD - DELIVERING THE BEST POSSIBLE OUTCOMES USING THE LATEST IN SCIENCE, RESEARCH AND SUSTAINABLE THINKING.

OUR PARTNERSHIPS HAVE LED TO IMPROVED DESIGN, GREATER OPPORTUNITIES AND GLOBAL RECOGNITION FOR OUR SOLUTIONS. HOPEFULLY WE REPAY OUR PARTNERS IN KIND, HOWEVER WE WOULD LIKE TO THANK ALL THOSE WHO SUPPORT OUR WORK AND HOPE WE CAN DEVELOP THESE RELATIONSHIPS FURTHER THROUGHOUT 2024.



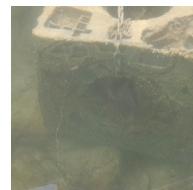
GOALS ACHEIVED 2024



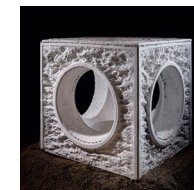
Achieve B Corp and ISO certification



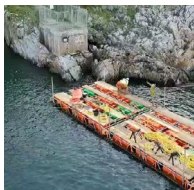
Create a standalone Sustainability page on our website for sustainability related information



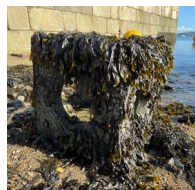
Expand our project scope across EMEA and APAC



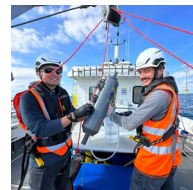
New textures for Reef cubes and Reef mats created and continuous product innovation



Optimise new lower impact forms of instalation



Increase projects across our region to highlights the necessity of protecting our coastal environments and communities



Explore and pilot new biodiversity monitoring techniques

LOOKING TOWARDS 2025



Create innovative
biodiversity analysis software



Make ARC marine HQ into
a cutting edge sustainable
marine research facility



Complete first offshore wind
scour protection deployment
at scale



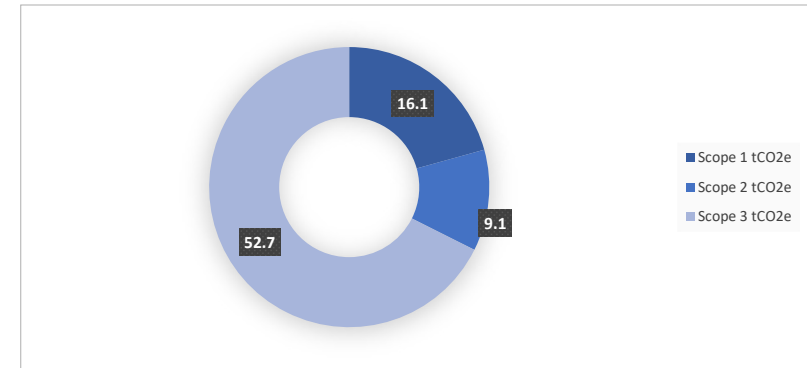
Optimise and realise our
Reef cubes® in a box (RIB)
system

APPENDIX



GREEN HOUSE GAS INVENTORY SUMMARY

Term	Explanation	Source
Anthropogenic Biogenic Green House Gas Emission	GHG Emission from biogenic material as a result of human activities e.g. burning wood, biodiesel, or fugitive emissions from anaerobic digestion facilities.	ISO 14064-1
Base Year	Specific historical period identified for the purpose of comparing GHG emissions, GHG removals or other GHG related information over time.	ISO 14064-1
Biogenic Carbon	Carbon derived from materials of biological origin, excluding material embedded in geological formations and material transformed to fossilized material.	ISO 14064-1
Biogenic Carbon Dioxide (CO ₂)	CO ₂ derived from oxidation of biogenic carbon.	ISO 14064-1
Carbon footprint	The absolute sum of all emissions and removals of greenhouse gases caused directly and indirectly by a subject either over a defined period or in relation to a specified unit of product or instance of service and calculated in accordance with a recognized methodology.	BSI PAS 2060
Carbon Neutral	The condition in which during a specified period there has been no net increase in the global emission of greenhouse gases to the atmosphere as a result of the greenhouse gas emissions associated with the subject during the same period.	BSI PAS 2060
Global Warming Potential (GWP)	The Global Warming Potential is defined "as the time-integrated radiative forcing due to a pulse emission of a given component, relative to a pulse emission of an equal mass of CO ₂ ". These values are reported as a unit of CO ₂ equivalent (CO ₂ e), which compensates for the greater impact of some non CO ₂ GHGs. The GWP values used in this report are from IPCC Assessment Report 5, 2007.	IPPC, 2013
Greenhouse Gas Inventory	A list of GHG Sources, GHG Sinks, and their quantified GHG emissions and GHG removals.	ISO 14064-1
Greenhouse Gas Report	A standalone document intended to communicate an organization's or GHG Project's GHG related information to its intended users.	ISO 14064-1
Green House Gas Projects	Activities or activity that alter the conditions of the GHG baseline and which cause GHG emission reductions or GHG removal enhancements.	ISO 14064-1
Intended Users	Individual or organization identified by those reporting GHG related information as being the persons who rely on that information to make decisions.	ISO 14064-1
Non-Anthropogenic Biogenic GHG Emission	GHG emission from biogenic material caused by natural disasters (e.g. wildfire or insect infestation), or natural evolution (e.g. growth and decomposition).	ISO 14064-1



1.4. Carbon Footprint by Scope and Activity

