



# Sustainability Report 2022

Heerema Marine Contractors  
June 2023 | Leiden







**Successful floating installation method**

Heerema, Vestas and Parkwind completed their first floating installation of 24 9.5MW turbines using Heerema’s novel Rotor Nacelle Assembly (RNA) method on the Arcadis Ost1 project in the Baltic Sea. We used our Simulation Center extensively to develop the procedures and train our crew. This innovative method has two main advantages. The first is zero seabed interaction, which is especially important in areas of significant water depth or challenging soil conditions. The second advantage is a shorter installation cycle.

Not only do we contribute to the energy transition by introducing this novel installation method, we also focus on a sustainable execution of the project itself: the support tower is recycled from a previous project and battery packs on the barges avoid the use of diesel powered generators and related emissions.

**9 SDG 9** | Industry, Innovation and Infrastructure. With our Simulation Center, located in Leiden, we contribute to upgrading technological capabilities of industrial sectors. With the introduction of our novel RNA method, we encourage innovation.



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# 1 Introduction

**At Heerema Marine Contractors, we are on a mission to make the impossible possible offshore in a way that creates sustainable values for our clients and stakeholders. We are guided by our Sustainability Roadmap, which is built on three pillars: Carbon Neutral, Circular Heerema, and Caring for People.**

Over the past sixty years, we have established a reputation for excellence, innovation, and safety. Today, we apply these principles and experience to our sustainability ambitions. Our ability to continually reflect and adapt is a key factor to our success in a changing world.

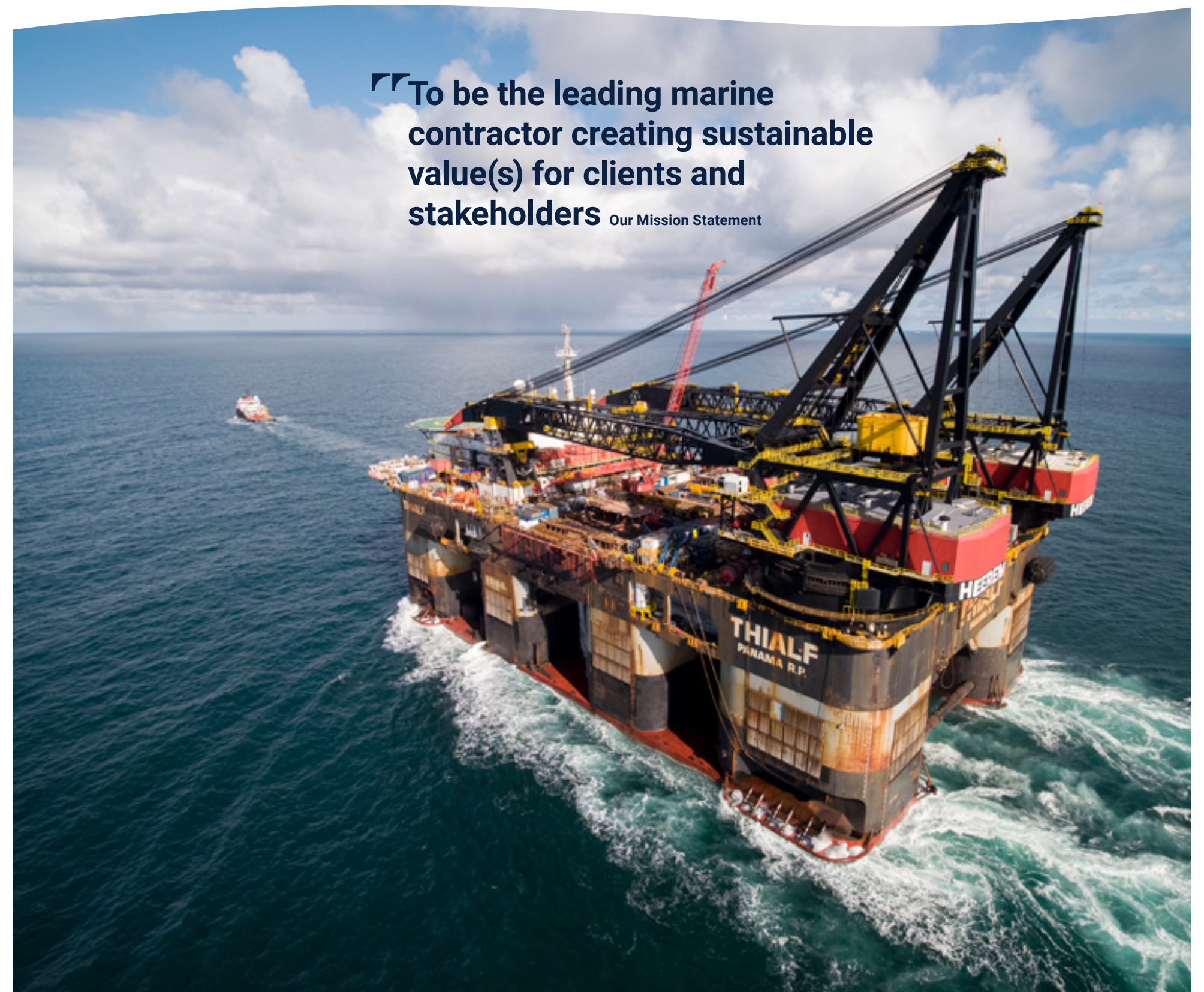
Throughout 2022, we continued to explore and implement opportunities to reduce our emissions, increase our circular processes, and care for people. Simultaneously, we carefully reviewed our sustainability objectives to ensure we have the best strategy for our forward-looking organization.

Within this report, it can be seen that sustainability is embedded within every department throughout Heerema. You will read contributions from many of our passionate and innovative colleagues.

Therefore, I invite you to continue reading Heerema's Sustainability Report 2022 to learn about our company-wide commitment to sustainability and how our mission is realized by all of us, together.



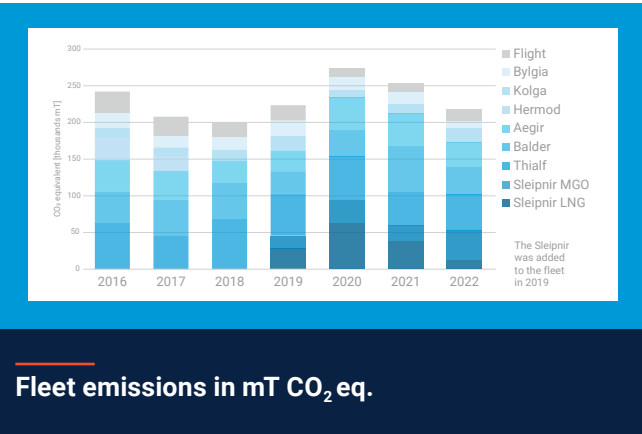
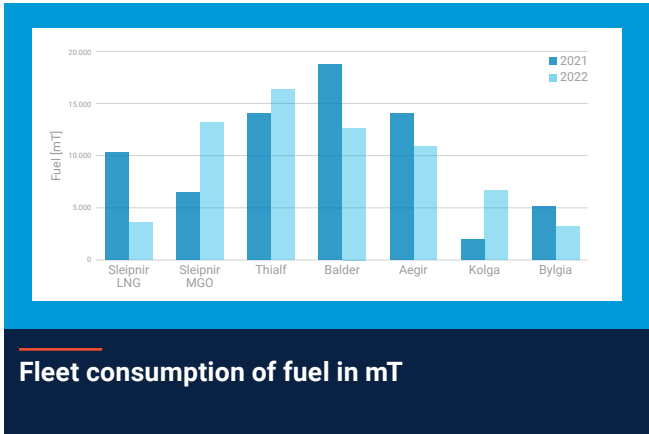
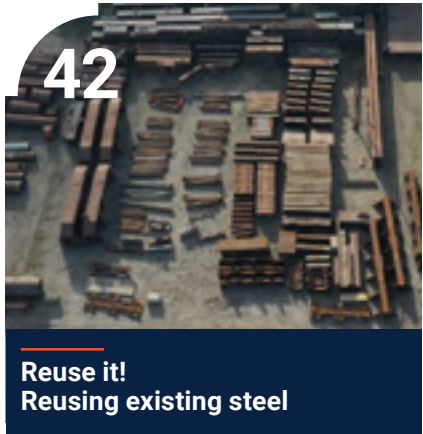
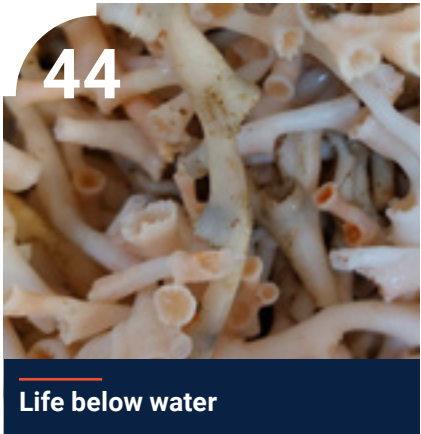
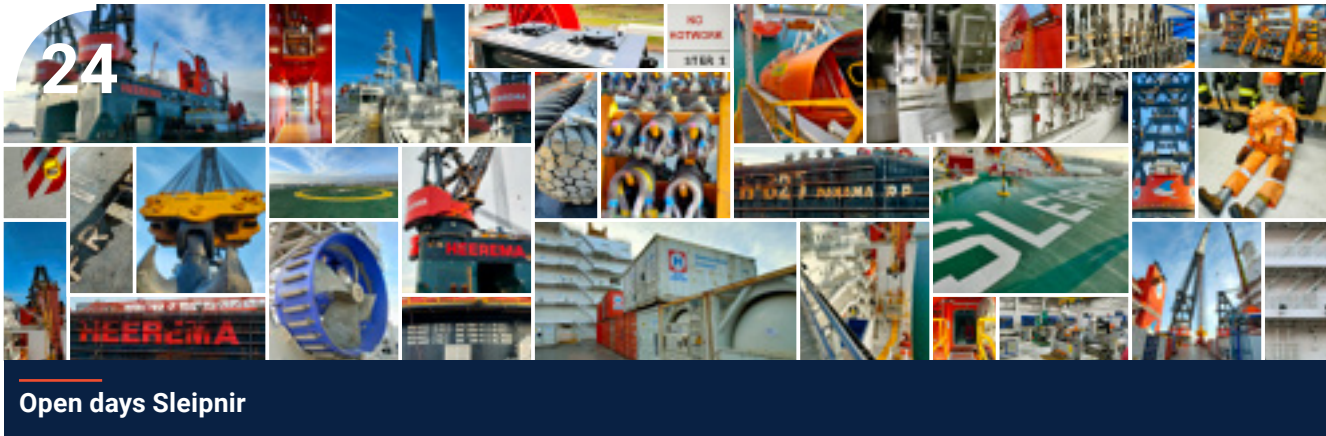
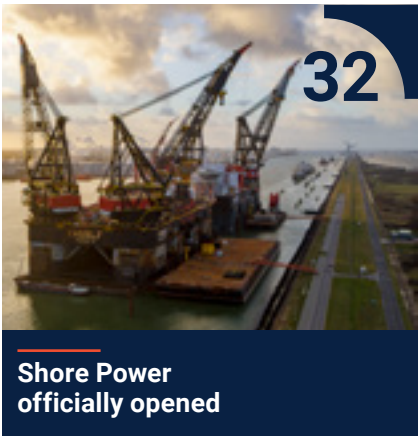
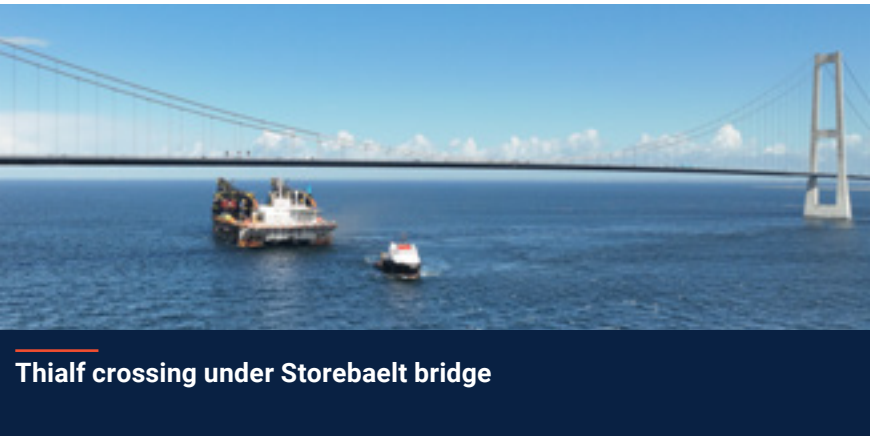
**Pieter Heerema**  
Chairman



**“To be the leading marine contractor creating sustainable value(s) for clients and stakeholders”** Our Mission Statement



# Heerema Highlights of 2022



Check the website for more information about our projects [www.heerema.com](http://www.heerema.com)



# 3 Our company at a glance

Making the impossible possible offshore

Our mission is to be the leading marine contractor creating sustainable value(s) for clients and stakeholders.

We deliver innovative and sustainable solutions for the transportation, installation, and removal of offshore infrastructure. We do so by managing the entire supply chain of project execution, offering solutions that include design and front-end engineering, planning, logistics, project management, and the execution of projects world-wide. In 2020, we started investing in

carbon offset projects that align with our mission. In 2021 we received an official certificate of compliance via an external audit, making us a Climate Neutral certified organization. Our most valuable asset is the people who work for the company. Their passion and skills are the driving force for the company's vision to make the

impossible possible offshore. It is a highly skilled workforce that works in offices worldwide and across its fleet of the world's largest crane vessels.

Within our fleet, we have the world's most sustainable semi-submersible crane vessel Sleipnir. In the table, you can learn more about our sustainability measures onboard our fleet.



### Wind

Driving the global energy transition by bringing Heerema's experience to the offshore wind industry.



### Decommissioning

Heerema has been removing offshore facilities safely, predictably, and sustainably for over thirty years.



### Transport and Installation

Heerema transports and installs offshore structures in a safe, cost-effective, and sustainable manner.



		SLEIPNIR		THIALF	BALDER	AEGIR	KOLGA BYLGIA
Lifting capabilities		2 x 10,000 mT		2 x 7,100 mT	6,300 mT	5,000 mT	-
Average Fuel Consumption per day [mT] <i>3 year average except for Sleipnir</i>		6 LNG	61 MGO	43 MGO	37 MGO	31 MGO	11 / 13 MGO
Emission Factors (mT/mT) <i>For example 1 mT LNG produces 3.887 mT CO<sub>2</sub></i> <i>Emission factors under constant review</i>	CO <sub>2</sub> eq.* NO <sub>x</sub>	3.557 0.01020	3.24999 0.05090	3.24999 0.05886	3.24999 0.05375	3.24999 0.04080	3.24999 0.05076
Operational Footprint							
Alternative Low Emission Fuels (LNG/GTL/HVO)		LNG		HVO/GTL	In progress	In progress	In progress
Marine Gas Oil low sulphur		✓		✓	✓	✓	✓
UREA system to reduce NO <sub>x</sub> emissions on MGO		✓		X	X	X	X
Optional noise mitigation during pile driving		✓		✓	✓	✓	-
Occupational health measurements		✓		✓	✓	✓	✓
Biodegradable oils non-floating spread and ROVs		✓		✓	✓	✓	-
Environmentally friendly cleaning products		✓		✓	✓	✓	✓
Highly effective bilge water separators		✓		✓	✓	✓	✓
Green Dynamic Positioning (DP) mode or equivalent		✓		✓	✓	✓	✓
State-of-the-Art Crane Power Management System		✓		✓	-	-	-
Optional sailing on one engine		-		-	-	-	✓
LED lighting cranebooms, deck, and exterior accomo		✓		✓	✓	✓	-
Ship Energy Efficiency Management Plan (SEEMP)		✓		✓	✓	✓	✓
Strict waste separation procedures		✓		✓	✓	✓	✓
Deck rainwater collection / treatment		✓		-	-	-	-
High Performing Fluorine-Free Foams for Firefighting		✓		-	-	-	-
Dedicated waste management controller		✓		✓	✓	✓	✓
Green Passport EU Notation		✓		-	-	✓	✓

\* including methane slip



Making the impossible possible offshore Our Vision



# Heerema's contribution to the energy transition

From installing multiple foundation types and the corresponding wind turbines themselves to removing decommissioned structures from the seas, Heerema is contributing to many aspects of the energy transition.

Sleipnir broke the lifting record for the heaviest lift by offshore cranes with the installation of the Tyra TEG processing platform. The lift of the 17,000 metric tons heavy process module broke a world record as the heaviest crane lift ever undertaken at sea. Nothing was left to chance when the two crane drivers, with the support of more than 260 offshore workers onboard Sleipnir, lifted what corresponds to the weight of around two Eiffel Towers. By lifting the topside in one single lift, emissions are saved due to the highly efficient nature of the execution. This platform is part of the Tyra complex; an important asset in the energy independence of Denmark.

RECORD  
BREAKING  
LIFT

In 2022 Heerema vessels were busy in the North Sea removing old platforms. In total we removed 70,357 mT of steel, which was all safely transported to recycling yards in Norway, UK and The Netherlands.

For the Murdoch platform removal, we used recycled steel for 80% of the grillage

Heerema used novel installation techniques to unlock the potential of wind farms in locations with challenging soil conditions

On the Dunlin project the Module Support Frame (MSF) and 5 modules (together 11,820mT) were lifted as a single lift and transported to the decommissioning yard in the cranes of Sleipnir. This highly efficient method pushed the vessel to the max and avoided steel for grillage as well as reducing fuel consumption by not needing a transport barge and tug.

Balder completed its first project in the wind industry with the Neart na Gaoithe wind farm. Now all our crane vessels have contributed to the wind projects and the energy transition.

INSTALLED  
TURBINES

Thialf was the first floating vessel to ever install wind turbines on the Arcadis Ost 1 project. In 2022, 9 of the 27 turbines were installed. Once the entire wind farm is complete it will provide energy for the equivalent of 290,000 households.

Sleipnir installed 71 Gravity Based Structures (GBS) as foundations for a wind farm in the first project to ever install GBS foundations by lifting method. The field will have capacity for 500MW, sufficient domestic energy for around 770,000 people.

GRAVITY  
BASED  
STRUCTURES

In 2022, Aegir installed the 111th Jacket of the Greater Changhua 1 and 2a wind farms. Once completed these two wind farms will have a capacity of 900MW and be able to provide clean energy to approximately 1 million homes.





# 4

## Our commitment to Sustainability





# 4.1 Sustainability Beliefs

We act sustainably because we want to

For many years now, Heerema has believed that a responsible company has an obligation to act in a sustainable manner.

Heerema is committed to creating value(s) that encompass the three pillars of sustainability, namely: Social, Environmental, and Economic values. This means that people, planet, and prosperity are all drivers within the company and as a result sustainability is embedded into all daily work practices. To move values into action, Heerema uses a Sustainability Roadmap that guides all employees and sets out concrete ambitions and goals. The Roadmap is based on the United Nations' Sustainable Development Goals and the sustainable ambitions of the International Maritime Organization.

OUR ACHIEVEMENTS

The sustainable achievements show some of our recent sustainability successes.

OUR PROJECTS

The projects in the Sustainability Roadmap bundle our current initiatives. They can be seen as the foundation on which we translate our values into action. Reduce Footprint and Emissions, Sustainable Supply Chain Management, and Good Health and Well Being, all together achieve an optimal balance of the triple bottom line. Ultimately our initiatives move our sustainability agenda forward by creating sustainable values, awareness and involvement.

OUR AMBITIONS

The ambitions set targets on social, environmental, and economic sustainability-related aspects. Not only do we set ambitions in terms of emissions reduction, resource consumption or sustainable employability, it also contains the strategy on how to get there.



We use our Sustainability Roadmap for long-term strategy and sustainable development planning. It reflects our sustainability journey and is therefore being updated according to lessons learned along the way.

Meike Kolthof | General Manager Sustainability







## 4.2 Required leadership to reach our sustainability goals

Support by Heerema's Board of Directors

Heerema's Board of Directors steers the company and provides the support and leadership required to reach our sustainability goals. In 2022, Heerema introduced a new Board of Directors, including Philippe Barril as Chief Executive Officer and Ramon de Haas as Chief Technology and Human Resources Officer. For this Sustainability Report, Philippe and Ramon were asked what sustainability means for them and for Heerema.

Sustainability is a key topic for the present and future of our company. Based on our continued commitment to sustainability, the board is engaged regularly to assess progress and to validate the resources against our current and future targets. The environment dictated by the various regulators brings levels of complexity to carbon neutrality – engagement at the shipping industry level is the way forward. While the board has established an accelerated path to lowering emissions this needs to be reconciled with the technical feasibility and leveraging on supporting the carbon credit external options.

With the war in Ukraine and the volatility in fuel prices the board was engaged in arbitrating the fuel choices with a focus on certainty on securing volumes (continuity of operations). For the future establishing industry benchmarks, engaging with our customers for which we constitute their scope three will continue to be a focus in order to validate our offers and for driving our internal initiatives.

**Philippe Barril**  
CEO

Mental health and well-being of our employees is a top priority for us. As a start we need to promote open and honest communication around mental health in the workplace, encouraging employees to talk openly about their experiences and seek help when needed. Also I am committed to creating a learning organization that promotes growth and development for all employees. For me a learning organization is a workplace where we use our drive and curiosity to continuously acquire knowledge, experiment and adapt to a changing outside world in order to build and maintain a sustainable company. Our company is immensely diverse, which allows us to offer a range of opportunities, to support employees' career growth and development. Last but not least I want our work to be enjoyable and engaging for all. This includes celebrating successes and milestones, promoting work-life balance, and creating opportunities for employees to connect and build relationships with one another.

Overall, my approach to Caring for People is integrated and forward-thinking, recognizing the importance of mental health, career development, and a positive workplace culture. Together we can create an environment in which employees can thrive and achieve their full potential.

**Ramon de Haas**  
CTO | CHRO



## 4.3

# A reflection on our decarbonization plan

**In 2020, Heerema Marine Contractors presented its Carbon Neutral Roadmap with a focus on the prevention and reduction of emissions. This roadmap was a plan to reduce 80% of our greenhouse gas (GHG) emissions by the end of 2026. Additionally, Heerema became the first offshore contractor to compensate scope 1 and 2 emissions, making us a Climate Neutral certified organisation.**

The belief and dedication behind this plan remain firm within the company. However, we must continuously reflect and adapt so that we can recognize challenges in our approach and in the solutions we identify. By periodically reviewing the roadmap and sharing those results we can transparently communicate uncertainties and new resolutions.

Carefully balancing between people, planet, and prosperity, is what Sustainability means for Heerema. While reviewing, this triple bottom line remained the basis. In the second half of 2022, we have identified through an extensive review process that the plan must be revised. There are various factors, such as the significant change in the predicted costs and global availability of bio-fuels since 2020, slower than anticipated progress in decarbonization technologies, and the uncertain landscape of regulations and financing possibilities that have guided our decision-making.

Our Roadmap will therefore be updated with the aim to have an ambitious, robust, but above all an achievable decarbonation plan.

This reconsideration remains a decision within a landscape filled with uncertainties: financing and subsidies of EU based developments, regulations in and outside of Europe, developments in the availability of future fuels as well as the engines that will use them, and research into feasibility of measures to reduce the amount of fuel used by existing engines. Therefore, we will continue to set the bar high. But, we recognize that not every factor

is within our control. These complex challenges demand realistic decision-making, including the revision of our roadmap.

Our vessels are unique, with special requirements and each will have its own decarbonization plan, tailored to the vessel's characteristics and requirements. With these plans, we remain committed to achieving our decarbonization ambitions in line with existing guidelines. We are also aware of external factors that might influence our efforts and therefore our impact.



**Reflection on Heerema's decarbonization plan has given us an opportunity to pause and reassess the factors within our control and the factors outside our control. The revision will be robust, ambitious and focused on action. Additionally, the most up to date financial and technological landscapes will be taken into account.**

Meike Kolthof | General Manager Sustainability



# 5

## Caring for People



### Health & Well-Being | Organization | Heerema Culture

One of the ambitions in the Heerema Sustainability Roadmap is to Care for People by taking Social Responsibility seriously.

To achieve sustainable employability, Heerema aims to create an environment where employees can feel happy, healthy, safe and motivated until retirement. All measures currently taken by various departments focus on three pillars: Health & Well-Being, Organization and Heerema Culture.



# 5 Caring for people

**HEALTH & WELL BEING | ORGANIZATION | HEEREMA CULTURE** The Heerema Sustainability Roadmap includes the Caring for People program divided into three sections; Health & Well Being, Organization and Heerema Culture

## Health & Well-Being

**The physical and mental health of our colleagues**

Within Heerema we focus on the physical health and mental well-being of our colleagues. In 2022 we again held our Dare to Care Safety days. The Safety Days are safety workshops where vessel management teams and senior management meet together to discuss safety performance, celebrate achievements and acknowledge the upcoming path to improve our safety mindset and Dare to Care program further.

## Organization

**The way we execute our daily jobs**

When working globally, different aspects are part of our daily job. Each has its own opportunities, improvement possibilities, and partnerships. Our new colleagues get a quick start with our intensive introduction days and existing colleagues are supported in their career journeys with our Heerema Development Program. In 2022 we have increased the focus on Social Safety with a variety of actions being taken on this topic.

## 5.1 OPEN DAYS SLEIPNIR

## 5.2 SUPPORTING EDUCATION

## 5.3 VISIT HEAD OF THE CABINET TO FRANS TIMMERMANS, VICE PRESIDENT OF THE EUROPEAN COMMISSION

## Heerema Culture

**The character of our organization**

Collaborating as one Heerema while we share our passion. We all take our job seriously, with plenty of room for fun. An example of one of our Heerema Culture initiatives is the continuation of the Founder's Mentality sessions for our global workforce.

## Caring for people | Taking our Social Responsibility

### Health & Well-Being

Safety



Working Conditions



Physical Health



Mental Well-Being



### Organization

Continuous Improvement



Career Journey



Workers Participation



Building Partnerships



### Heerema Culture

One Heerema



Personal Leadership



Passion and Fun



Diversity & Inclusiveness





# 5.1 Open days Sleipnir

**In November 2022, we held Open Days onboard Sleipnir! The vessel's team safely welcomed more than 2,000 enthusiastic visitors, made up of Heerema colleagues and their family and friends.**

After registration and a negative COVID-19 antigen test, everybody could enjoy a well-organized tour of Sleipnir to get an idea of life on board. The tour covered the entire vessel including a spare thruster on deck,

the main crane hook, the bridge, engine room, accommodation, hospital, mess room, and gym. There were also refreshments provided in the cinema where visitors had a chance to taste the famous high-quality food.

Crew members were happy to share fascinating insights into how the vessel stays on position in the middle of the sea for days, weeks, or even months at a time and how the engines are controlled from the engine control room.



It was very important to me that the crew members of Sleipnir could show the vessel to their families and friends. They worked with pride and a lot of perseverance to get Sleipnir to where the vessel is today. When we left Singapore from the shipyard, the vessel had, as all new vessels have, teething problems. The crew has managed to make the Sleipnir a good and efficient vessel in the last couple of years and we are proud of that and we would like to show it to the outside world.

Jack Geluk | Captain

**SLEIPNIR TOUR  
STARTS HERE**



The Sleipnir open days were not just about experiencing one of my future floating workplaces and seeing (for the first time) what everyone talks about: the incredible size of the vessels, the tools and of course... the food. For me, it was about sharing the experience with my friends and making it tangible what Heerema does. In simple words, it's not just about "heavy lifting", installing offshore structures or removing them. The visit to Sleipnir painted a picture of strong teamwork and sense of community between onshore and offshore crew. I imagined having a home offshore would be impossible, but Heerema's slogan fits well – "Making the impossible possible offshore" – even a home.

Lea Meyer | Junior Engineer, HMC Leiden



## 5.2 Supporting education

### FIT WITH SDGs

To move values into action, we use our Sustainability Roadmap. Based on the United Nations' Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

These initiatives contribute to a number of Sustainable Development Goals, among others:

**4 SDG 4** (Quality Education) by promoting learning opportunities that acquire the knowledge and skills needed to promote sustainable development.  
**17 SDG 17** (Partnerships for the Goals) by sharing knowledge, expertise, technology and resources, to support the achievement of the Sustainable Development Goals.

### FIT WITH STRATEGY

As part of the Caring for People Roadmap, Workers Participation and Building Partnerships are both initiatives within the pillar Organization to take our social responsibility.

**Heerema supports educational projects, our future colleagues are learning today in schools, colleges and university.**

### SDG Challenge

Collaboration between Leiden University students and Heerema to answer the question "how to create a behavioural change within Heerema to speed up the carbon neutral ambitions and inspire others?"

The students came up with ideas such as a green team from across the company to brainstorm new ideas or a sustainability day focussing on the individual SDGs organised as a fair.

### Collaboration with Da Vinci College

Heerema invited students from the Da Vinci College Leiden, who study topics that focus on research and design, to explore new ideas in which

(parts of) retired oil and gas platforms are reused or repurposed according to the circular economy principles. The students came up with solutions that not only reused or repurposed the structures but also focused on tackling social problems, such as housing shortages! This project was informative and fun, and Project Manager Sustainability, Arjan Buijsse, said the following: 'working together with today's students on tomorrow's circular challenges is a great way to combine Heerema's extensive decommissioning experience with new and creative solutions! It was inspiring to see sustainability as a win-win solution.'



## 5.3 Visit head of the cabinet to Frans Timmermans, Vice President of the European Commission

**In 2022 Diederik Samsom, head of the cabinet to Frans Timmermans, the Vice President of the European Commission, visited Heerema's office in Leiden.**

He shared an interesting lecture on the European Green Deal before we held an open discussion with the Heerema expert panel. During the lecture, Diederik explained what the European Green Deal entails, what challenges are ahead, and how Heerema can play a role.

The lecture also had an interactive section where colleagues could vote red or green to thought provoking questions.

The lecture stimulated much thought by colleagues and interesting conversations at the coffee machines.



Two things stood out: one, that Europe needs to become independent for its key energy production, and two, that Europe needs to invest in green energy solutions. During the open discussion, all kinds of challenges facing energy were touched upon. But for the most part, the questions were returned as a challenge to Heerema to continue contributing to the efforts.

Jetro Dam | Senior Specialist Engineer

### FIT WITH SDGs

To move values into action, we use our Sustainability Roadmap. Based on the United Nations' Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

These initiatives contribute to a number of Sustainable Development Goals, among others:

**17 SDG 17** (Partnerships for the Goals) by encouraging and promoting effective public, public-private partnerships.

### FIT WITH STRATEGY

As part of the Caring for People Roadmap, Building Partnerships is an initiative within the pillar Organization to take our social responsibility.





# 6

## Our impact on the environment





# 6.1 Carbon Neutral

**PREVENT | REDUCE | COMPENSATE** The Heerema Sustainability Roadmap includes the Carbon Neutral program, which contains yearly targets that either prevent or reduce emissions at the source. We are exploring a variety of projects, such as Shore Power and alternative fuels.

In 2020, Heerema began investing in carbon offsetting projects that align with its mission to create sustainable value(s). These are certified carbon reduction projects with the accredited Climate Neutral Group. Additionally, emissions will be either prevented by eliminating the combustion of fuel or reduced by changing or reducing the amount of fuel required or increasing combustion

efficiency. The goal is to be Carbon Neutral using 'zero-emission technology' wherever feasible. In our first year of being Carbon neutral, we have compensated 100% of our emissions. Moving into year two, we set the ambitious goal to prevent 5% of our emissions at the source. We are proud that we hit this target with our Shore Power connection in the Port of Rotterdam.

6.1.1  
SHORE POWER  
OFFICIALLY OPENED

6.1.2  
CARBON NEUTRAL  
THESIS PROJECTS



## Carbon Neutral | Net Zero GHG Emissions

### Prevent

Shore Power



Hybridization



Solar



Software & System Optimization



### Reduce

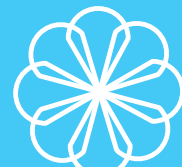
Hydrogen



SCR/Scrubbers



Alternative Fuels

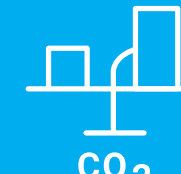


### Compensate

Renewable Energy Project



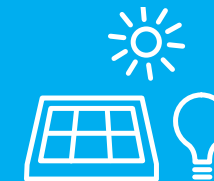
Carbon Capture



Cookstoves



Solar Lamps





# 6.1.1 Shore Power officially opened

Sleipnir and Thialf connected to Shore Power

**Heerema Marine Contractors' largest crane vessels, Sleipnir and Thialf officially switched from using their engines to using Shore Power whilst alongside in Rotterdam.**

The successful commissioning of the Shore Power project is the result of a partnership between Eneco, the Port of Rotterdam Authority, and Heerema with the support of the City of Rotterdam.

Shore Power enables vessels to switch off their engines and plug into the electrical grid for their energy supply. The connection built by Heerema, Eneco, and the Port of Rotterdam will supply Sleipnir and Thialf with sustainable energy which originates from wind turbines located on the headland nearby or from another renewable source should it be required. In total, 9 wind turbines in the port are used to power Heerema vessels in Rotterdam.

The Shore Power connection has a 20 MW capacity, which is the energy equivalent of around 15,000 homes. As the vessels turn off their engines

when connected to Shore Power, virtually all emissions and particulate matter are prevented because no more marine gas oil or LNG in Sleipnir's case will be used. This action has direct benefits for local residents

with air quality improvements and a reduction in CO<sub>2</sub>. Also, without the engines running there is a significant reduction in noise nuisance.



[heerema.com/news/shore-power-heerema](https://heerema.com/news/shore-power-heerema)



**20  
MW**  
WHICH IS  
THE ENERGY  
EQUIVALENT  
OF AROUND  
**15.000**  
HOMES



## FIT WITH SDGs

To move values into action, we use our Sustainability Roadmap. Based on the United Nations' Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

This sustainability initiative contributes to a number of Sustainable Development Goals, among others:

- 3 SDG 3** (Good Health and Well-Being) by contributing to the reduction of noise and emissions locally.
- 7 SDG 7** (Affordable and Clean Energy) by facilitating access to clean energy technology.
- 9 SDG 9** (Industry, Innovation and Infrastructure) by supporting technology development.

## FIT WITH STRATEGY

As part of the Carbon Neutral Roadmap, Shore Power is one of the initiatives within the pillar Prevent to achieve our Carbon Neutral ambition.



# 6.1.2

## Carbon Neutral thesis projects

Heerema supports students by offering opportunities for Master’s thesis projects over various specialisms.

Several students from the Technical University of Delft studying for their Master’s in Sustainable Energy Technology have been focusing their research on carbon reduction technologies at Heerema’s Sustainability Department and are in the progress of writing or have finished their thesis project in 2022.

### FIT WITH SDGs

To move values into action, we use our Sustainability Roadmap. Based on the United Nations’ Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

This sustainability initiative contributes to a number of Sustainable Development Goals, among others:

**4 SDG 4** (Quality Education) by promoting learning opportunities that acquire the knowledge and skills needed to promote sustainable development.

**13 SDG 13** (Climate Action) by integrating climate change measures like hybridization, E-fuels and Carbon Capture and Storage into our decarbonization planning.

### FIT WITH STRATEGY

As part of the Carbon Neutral Roadmap, the graduation topics contribute to both the Prevent and Reduction pillars of our Carbon Neutral ambition.



Jaco Carbutto

TITLE OF RESEARCH

The impact of electro-fuel solutions for the marine sector

During my thesis internship at Heerema, I am performing a techno-economic analysis on how implementing various electro-fuels (e-fuels) will impact Heerema’s vessels. E-fuels are fuels produced using green electricity, water, and carbon dioxide or nitrogen, making them net-zero or low-carbon fuels. By looking at the modifications necessary to retrofit the SSCVs of Heerema and the associated costs, certain KPIs can be set up to quantify the impact of an e-fuel.



Thomas Weenk

TITLE OF RESEARCH

Smart Grid-Integrated Vessel through a shore power system

Batteries can potentially reduce operational costs for a vessel. A significant portion of shore power-related costs are grid tariffs, which are determined based on the maximum power demand. By reducing peak power demands, a grid-integrated battery-equipped vessel improves the business case for hybridization as it reduces operational costs of shore power by 10% while limiting the strain on the electricity grid.



Jesse Junker

TITLE OF RESEARCH

Development of a roadmap to a net-zero fleet

I developed a tool to examine the different adjustments that could be made to the Heerema fleet to reduce emissions. This tool was then used to calculate the resultant Green House Gas emissions reduction when using technologies such as new fuels, batteries, and CO<sub>2</sub> capture installations. I enjoyed the research and learned a lot while being part of the Heerema Sustainability team.



Bram Hoeksma

TITLE OF RESEARCH

A future proof new-built energy supply

The question of the fuel choice of the future is one of the big challenges in the current marine industry. Many alternative fuels are already on the market or entering soon. Different requirements for a vessel, such as engine type, fuel tanks, and everything in between, accompany these alternative fuels. During my research, I will develop a model that can advise a vessel owner on the most feasible option for a new vessel purchase (both technical and economical).





# 6.2 Circular Heerema

**PREVENT | REUSE | RETAIN** The third ambition in the Sustainability Roadmap is Circular Heerema: eliminate waste, pollution and unnecessary use of resources by means of prevention, reusing, and retaining.

## 6.2.1 UPCYCLING PPE

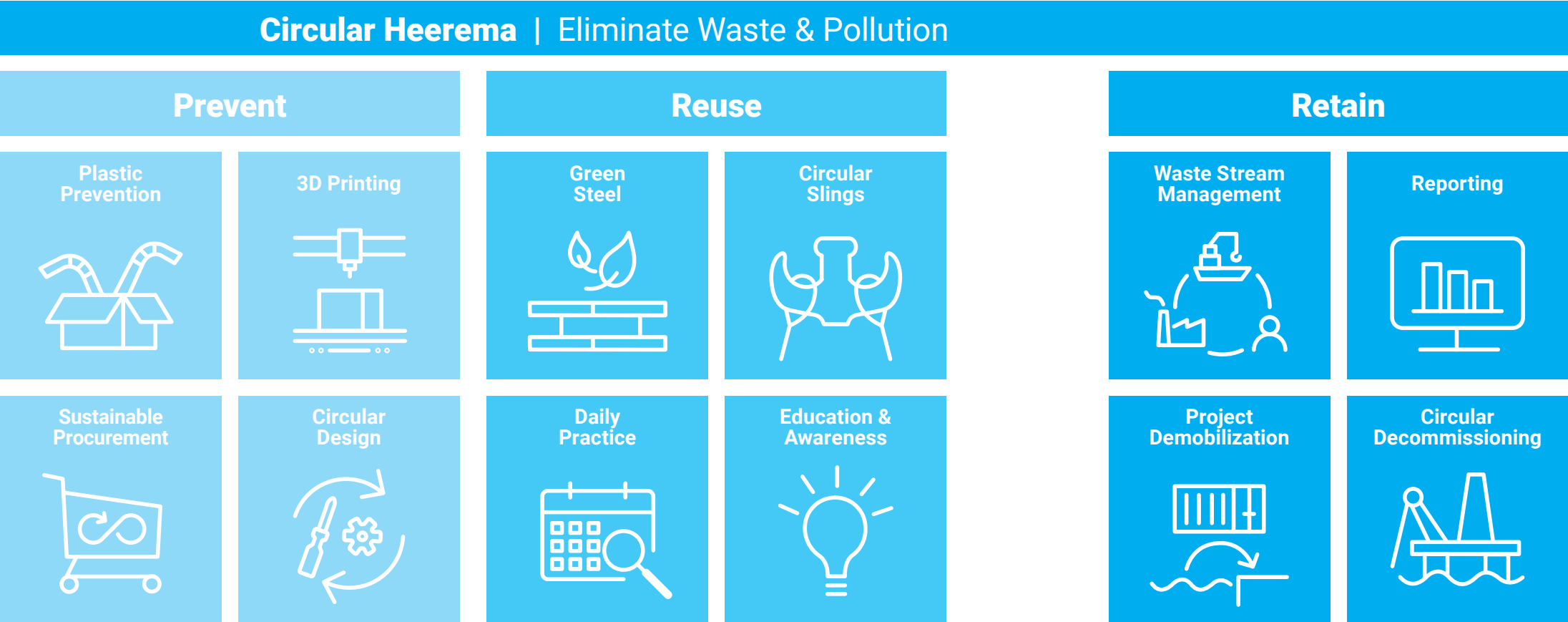
## 6.2.2 SLINGS FROM RECYCLED FEEDSTOCK

## 6.2.3 REUSE EXISTING STEEL

These pillars are derived from the [MacArthur Foundation's 9R's framework](#), facilitating an overview of circular strategies. This ambition is guided by a Circular Roadmap, which includes eliminating single-used plastics, sustainable supply chain management, and an internal steel market place. Prevention measures are classified as those that focus on

smarter product use and manufacturing. For example, sailing with a jacket in the cranes to prevent the production of additional grillage as done on Dunlin project in 2022. Also, the implementation of 3D printing onboard to reduce shipping of small printable parts is part of this pillar. Reuse measures are classified as those that focus on extending

the lifespan of products and parts, which is exemplified by the circular slings. Finally, Retain measures are classified as useful applications of materials at their end of life such as responsible waste stream management.





6.2.1

Upcycling PPE

Creating environmental and social impact

Upcycling PPE is a perfect example to demonstrate that retired PPE should not necessarily be considered waste: you can upcycle the retired PPE into different types of wearable products, which will last a long time while creating social impact.

In 2022 we collaborated with Vanhulley, a non-profit social enterprise, on a pilot project to upcycle our retired PPE into new products. Vanhulley contributes to circularity and provides education, talent development, language buddies, and work experience to women who are distanced from the labor market. Working together, we are contributing to a more environmentally and socially sustainable society.



FIT WITH SDGs

To move values into action, we use our Sustainability Roadmap. Based on the United Nations' Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

This sustainability initiative contributes to a number of Sustainable Development Goals, among others:

- 8 SDG 8** (Decent Work and Economic Growth) by promoting sustained, inclusive and sustainable economic growth and full and productive employment.
- 12 SDG 12** (Responsible Consumption and Production) by achieving a more efficient use of resources with the aim of increasing circularity.

FIT WITH STRATEGY

As part of the Circular Heerema Roadmap, Daily Practice is one of the initiatives within the pillar Reuse to achieve our Circular ambition. Part of Daily Practice is the use of our personal protection equipment.





# 6.2.2 Slings from recycled feedstock

Slings made from post-consumer plastic waste

FIT WITH SDGs

Sustainability Roadmap. Based on the United Nations' Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

This sustainability initiative contributes to a number of Sustainable Development Goals, among others:

9

SDG 9 (Industry, Innovation and Infrastructure) by supporting technology development.

12

SDG 12 (Responsible Consumption and Production) by achieving a more efficient use of resources with the aim of increasing circularity.

FIT WITH STRATEGY

As part of the Circular Heerema Roadmap, Circular Slings is one of the initiatives within the pillar Reuse to achieve our Circular ambition.

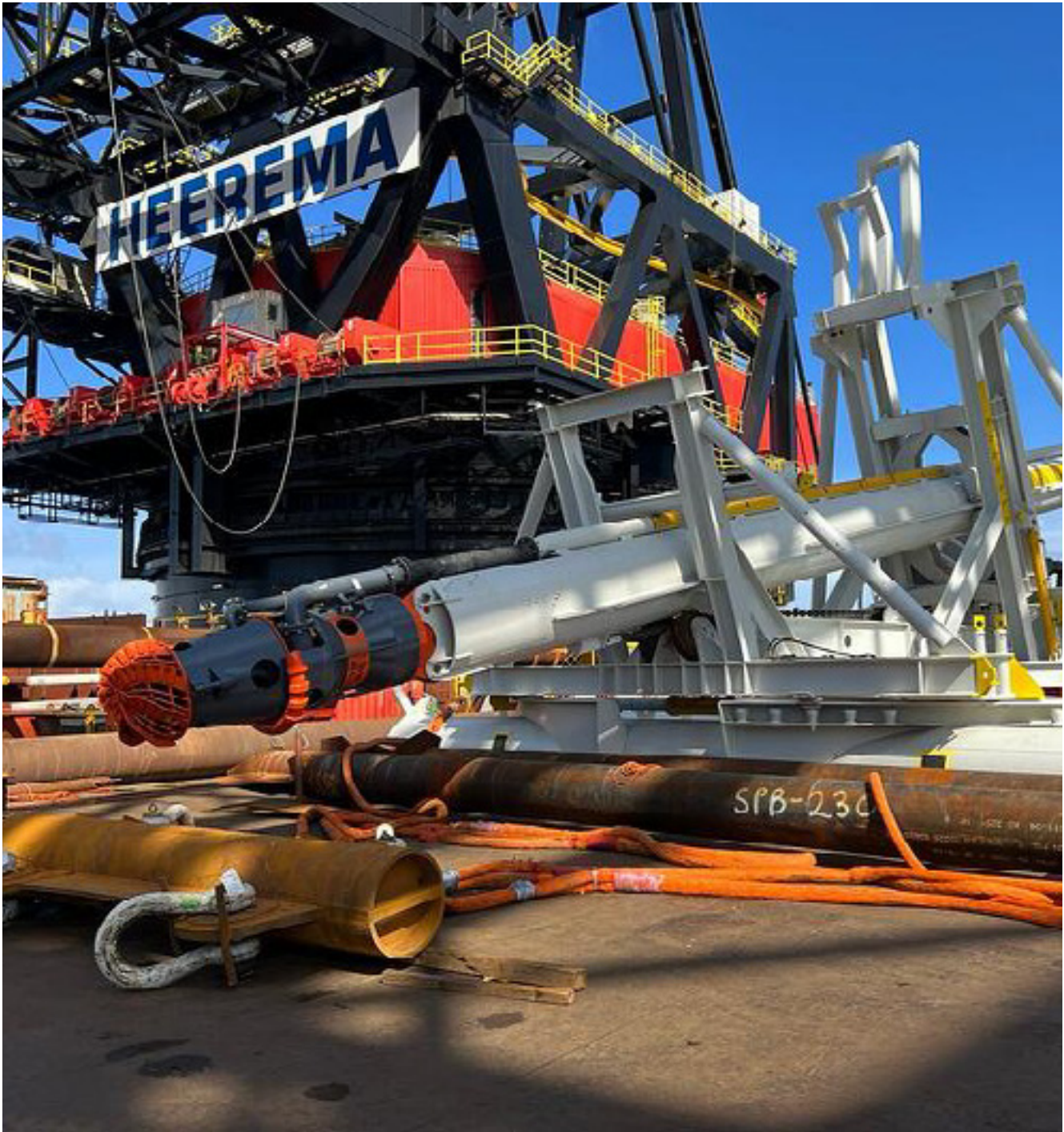
For the first time, slings fabricated with recycled plastic as a feedstock were used in the heavy lift industry. Lankhorst Ropes supplied Heerema Marine Contractors with Lanko®Force HL slings manufactured with Dyneema® SK78 fiber produced using post-consumer plastic waste as a feedstock. The Lanko®Force HL slings were used to deploy a subsea-operated tool to the seabed during a decommissioning project.

The slings have the same assured performance as bio-based slings, giving the quality needed with an improvement in sustainability.

“We already use bio-based Dyneema® SK78 to manufacture our 12-strand braided LankoForce® HL slings. By introducing post-consumer plastic waste as a feedstock, the industry is going further towards preventing valuable plastic from becoming waste and reducing carbon emissions from waste disposal,” says Marcel van der Molen, Sales Director Domestic, Heavy Lift & EPCI, Lankhorst Ropes.

**As Heerema procurement, we were happy that we had the opportunity together with Lankhorst Ropes to go a step further from using bio-based feedstock to Dyneema slings made of post-consumer plastic waste. This action is another step in our goal to procure as sustainably as possible and reduce plastic waste.**

Nico de Hoop | Specialist Buyer, Heerema Marine Contractors





# 6.2.3 Reuse it!

Reusing existing steel

Heerema looks for ways to reuse any existing steel – this way, we are both circular and prevent emissions produced during the manufacturing of new steel.

TOTAL REUSED STEEL WEIGHT (mT)					
Element type	2019	2020	2021	2022	2023
Beams	2676	1878	1292	2528	1859
Tubulars	413	560	289	802	421
Structures/specials	572	115	410	420	228
Total	3661	2553	1991	3750	2508

Notes: Values for 2023 are reservations for projects to be executed in 2023 (reporting cut off for 2023 reservations February 2023).



### FIT WITH SDGs

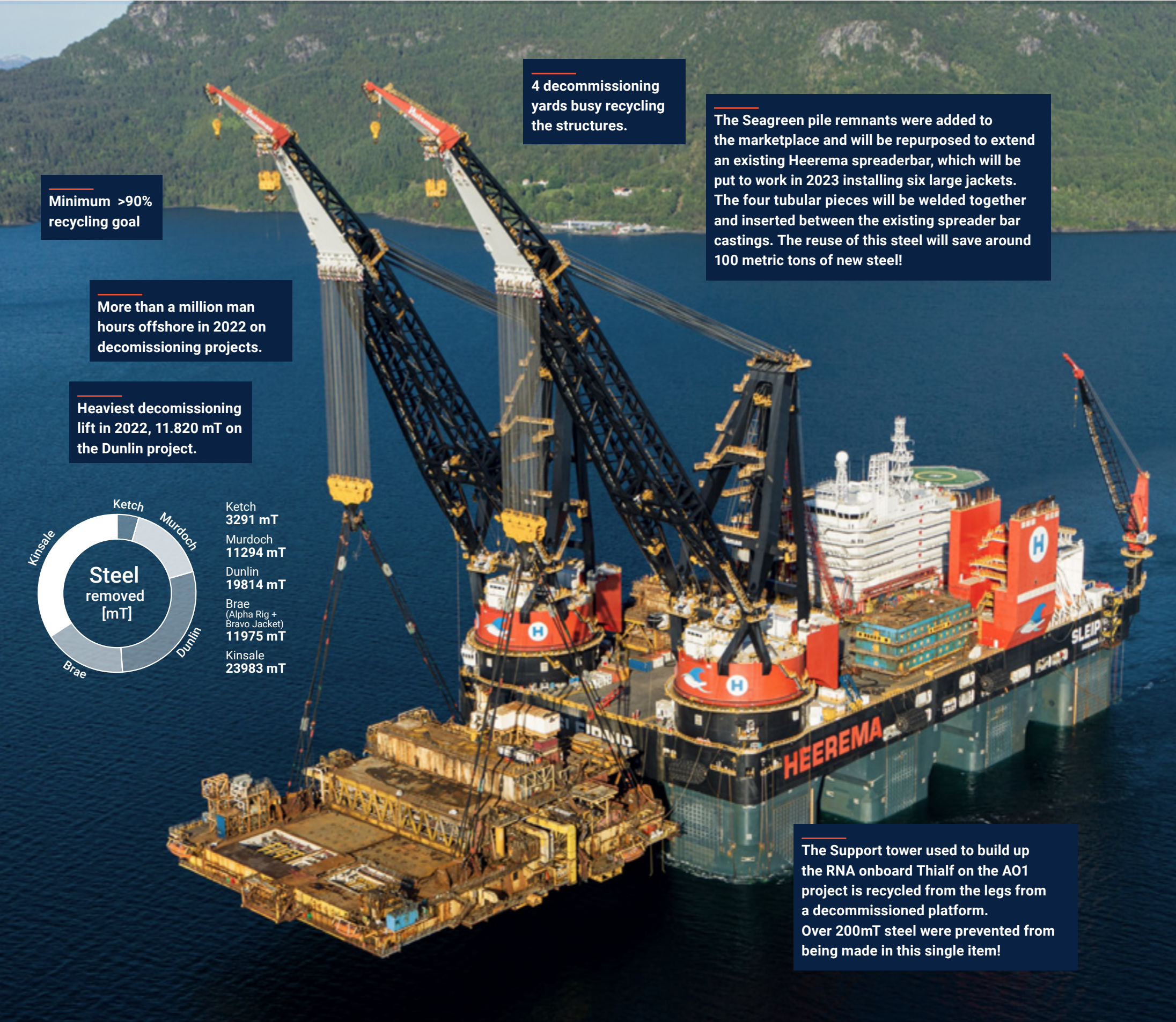
To move values into action, we use our Sustainability Roadmap. Based on the United Nations' Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

This sustainability initiative contributes to a number of Sustainable Development Goals, among others:

**12 SDG 12** (Responsible Consumption and Production) by achieving a more efficient use of resources with the aim of increasing circularity.

### FIT WITH STRATEGY

As part of the Circular Heerema Roadmap, Circular Decommissioning is one of the initiatives within the pillar Retain to achieve our Circular ambition.





# 6.3 Life below water

Facilitating research from our vessels

During the summer campaign of 2022, Heerema supported Wageningen University & Research (WUR) and Dr. Joop Coolen in collecting data for the Artificial Structures and the functioning of the North Sea EcoSyStem (ASSESS) project.

We assisted in this research in parallel with a Heerema project to remove topsides from a decommissioned oil platform in the Northern North Sea.

The WUR research aims to investigate the ecological value of artificial structures - including oil & gas platforms - in the North Sea. The artificial hard substrate on oil and gas platforms creates artificial reefs, which provide a habitat for multiple organisms (also known as fouling organisms or marine growth), increasing local biodiversity and potentially benefiting the wider marine environment. Over the last few years, the biodiversity of fouling organisms on platforms has been thoroughly investigated, but their functions require further research.

## FIT WITH SDGs

To move values into action, we use our Sustainability Roadmap. Based on the United Nations' Sustainable Development Goals (SDGs), it provides focus on our achievements, ongoing projects, and ambitions.

This sustainability initiative contributes to a number of Sustainable Development Goals, among others:

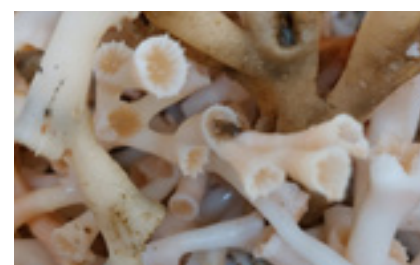
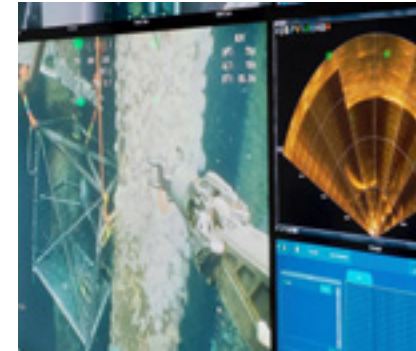
**14 SDG 14 (Life Below Water)** by increasing scientific knowledge and developing research capacity.

## FIT WITH STRATEGY

As part of our Dare to Care program, we care for the environment we work in.

Samples were collected from the marine growth on the platform, the surrounding seabed, the water column, and larger species such as fish and crabs to investigate the food web properties on and around the platform. These samples were conserved on board and later processed in a laboratory.

Heerema has supported the WUR research by accommodating the research team and their laboratory onboard Sleipnir. Furthermore, Heerema supported the collection of the samples using Heerema's submersible robots and cranes.



Despite the limited time available onboard Sleipnir, we were able to provide Joop and his team the support they needed to collect all samples. It was great to see their dedication to this project, and I'm glad we could contribute.

Ewout Bastian | Senior Project Manager Heerema



I was very impressed by the operation conducted on Sleipnir. The facilities onboard were great, and all people were very interested in what we were doing and were very helpful. It was great to conduct our research on this vessel.

In our labs, we are currently working on the samples and other data we collected and hope to have the results available later this year. The better understanding of ecosystem effects will help the management of the North Sea as more background information will become available to weigh in on the decisions to be made.

Dr. Joop Coolen | WUR



# 7

## Our impact in numbers



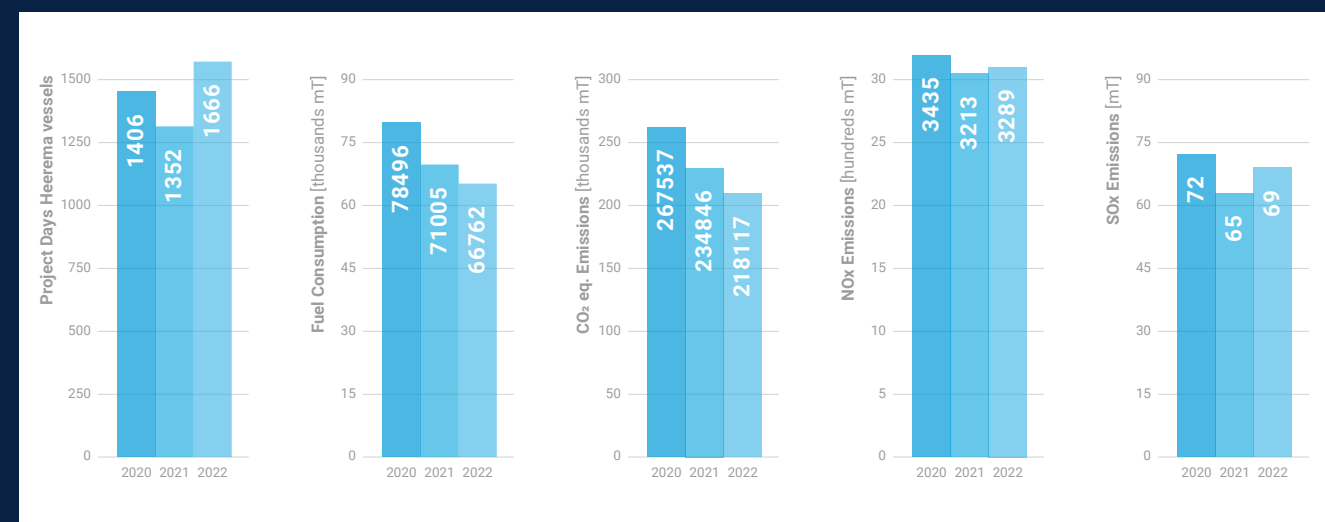


# 7.1 Reduce Footprint & Emissions

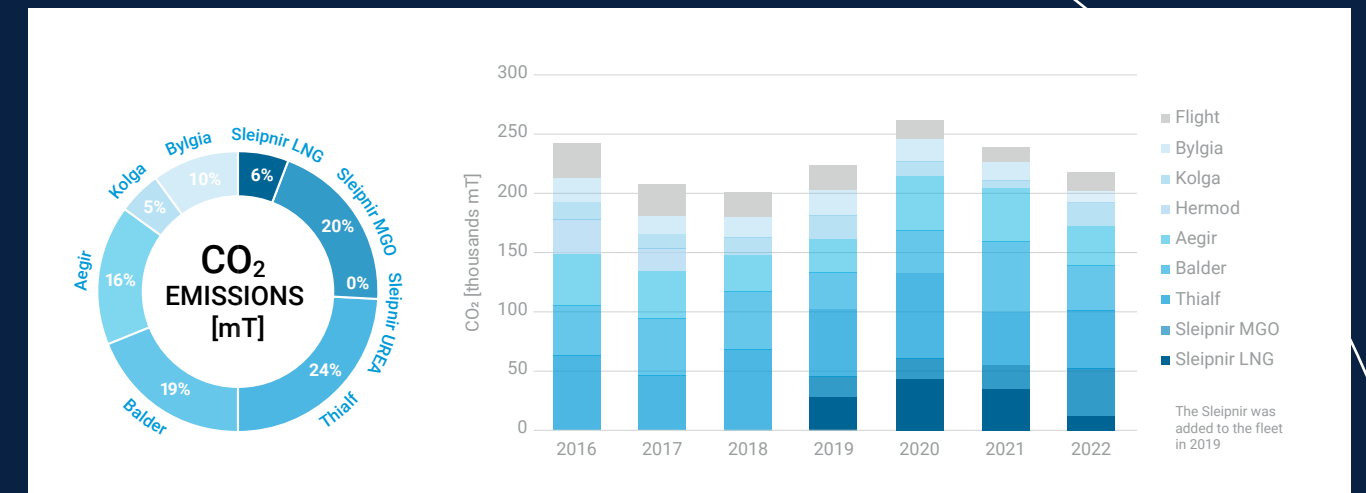
## Transit & Work per Vessel

	Consumption (mT)		CO <sub>2</sub> eq. emissions (mT)		NO <sub>x</sub> Emissions (mT)		SO <sub>x</sub> Emissions (mT)	
	2021	2022	2021	2022	2021	2022	2021	2022
Sleipnir LNG	10,175	3,719	37,147	13,228	104	38	0.2	0.1
Sleipnir MGO	6,577	13,252	21,376	43,069	335	675	8.1	18.1
Thialf	14,086	16,420	45,779	53,364	829	967	10.5	21.8
Balder	18,888	12,604	61,387	40,963	1,015	678	11.1	8.9
Aegir	14,009	10,951	45,528	35,589	572	447	22.8	8.6
Kolga	2,136	6,607	6,942	21,474	105	326	7.0	6.7
Bylgia	5,134	3,209	16,687	10,430	253	158	5.0	6.7
<b>Total</b>	<b>71,005</b>	<b>66,762</b>	<b>234,846</b>	<b>218,117</b>	<b>3,213</b>	<b>3,289</b>	<b>64.7</b>	<b>69.3</b>

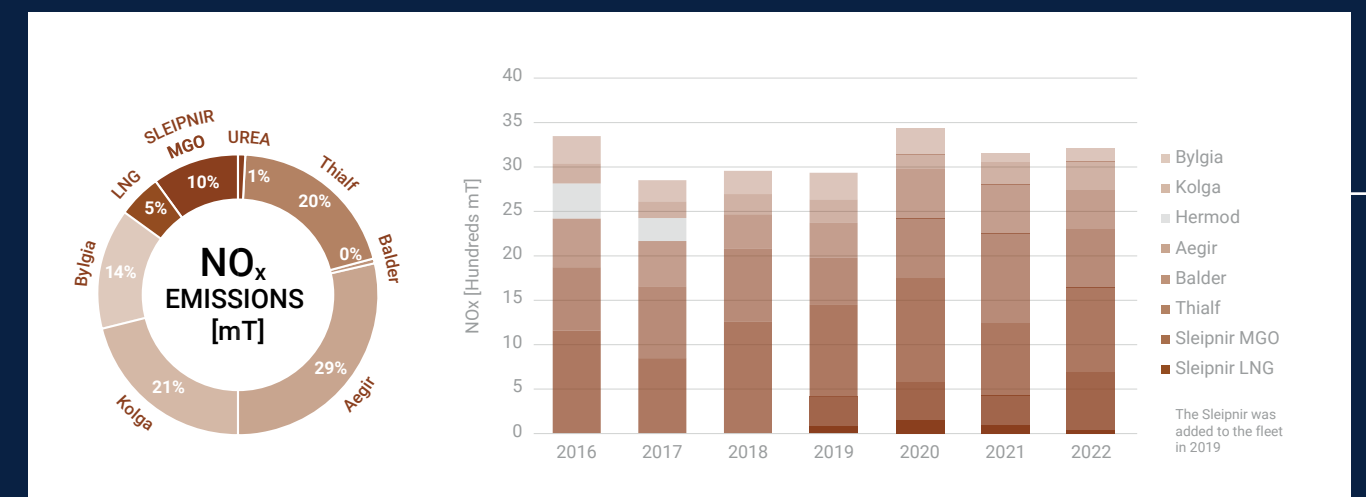
## Yearly Reduction Footprint (Scope 1)



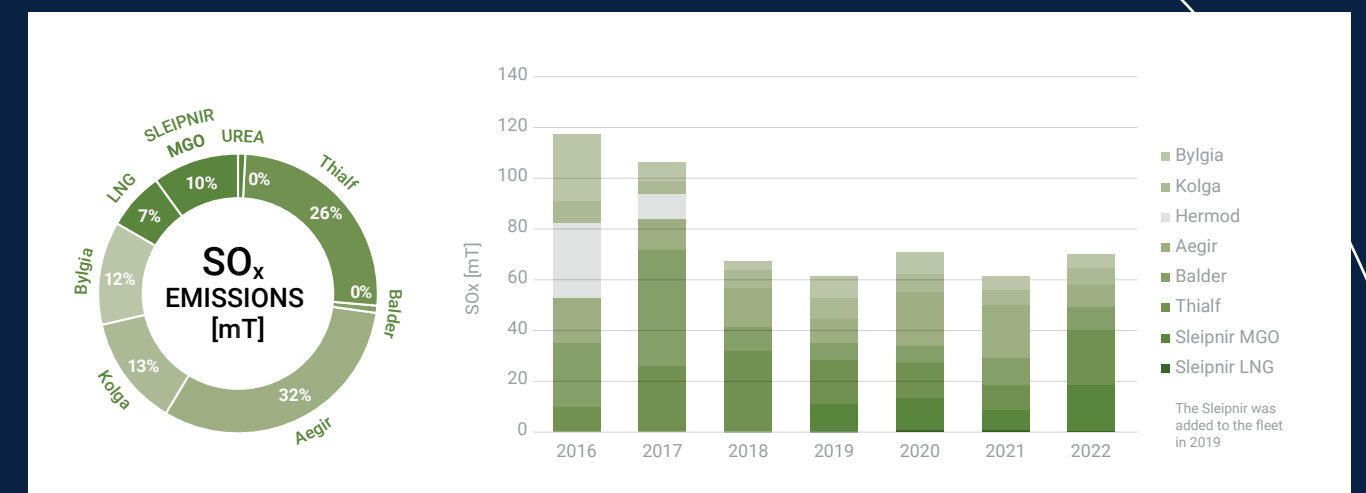
## CO<sub>2</sub> eq. emissions per Vessel



## NO<sub>x</sub> emissions fleet



## SO<sub>x</sub> emissions fleet





# 7.2 Waste Management

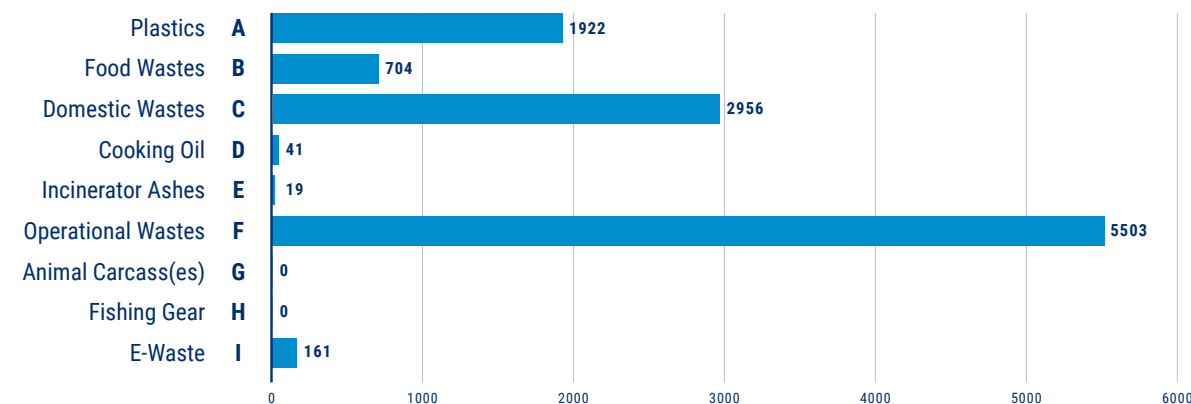
## Total amount of waste

from Heerema vessels in 2022

11,319m³

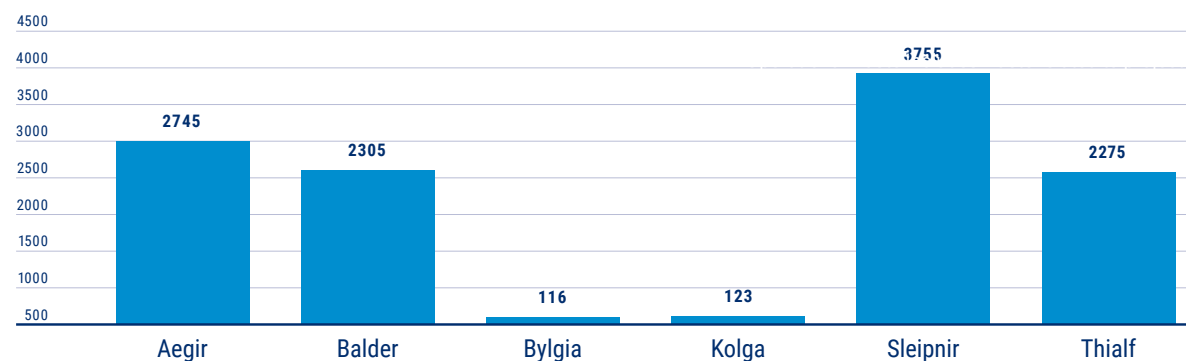
	2020	2021	2022	3 year average
Environmental Fines	0			
Total recorded oil spill incidents	9	7	8	8
Contained Spill	0	2	2	1.33
Uncontained Spill	9	5	6	6.66
Amount of oil spilled uncontained	168	144	93	135

## Total waste per category



Operational waste includes waste related to project execution

## Waste per vessel



“To be the leading marine contractor creating sustainable value(s) for clients and stakeholders

Our Mission Statement



**This Heerema Marine Contractors  
Sustainability Report covers our  
relevant projects and performance  
on the three Sustainability  
Ambitions over the year 2022**

Sustainability Report 2022



**Heerema Marine Contractors Nederland SE**  
Vondellaan 47  
2332 AA Leiden  
The Netherlands

*Mailing Address:*

**Heerema Marine Contractors Nederland SE**  
P.O. Box 9321  
2300 PH Leiden  
The Netherlands

+31 [0]71 579 90 00  
info@hmc-heerema.com  
www.heerema.com

