STAR SCIENTIFIC LIMITED

2024 Sustainability Report

TABLE OF CONTENTS

GLOSSARY

CSRD	Corporate Sustainable Reporting Directive
ESG	Environmental, Social, and Governance
ESRS	European Sustainability Reporting Standards
EU	European Union
GHG	Greenhouse Gas
HERO®	Hydrogen Energy Release Optimiser
R&D	Research and Development
RD&I	Research, Development, and Innovation
Star Scientific Ltd	Star Scientific Limited
TRL	Technology Readiness Level
US	United Stated of America

MESSAGE FROM LEADERSHIP

Welcome to this update of our inaugural Sustainability Report, this edition covering the calendar year of 2024.

It was a momentous period in the world of ESG. The new administration in the US significantly “stepped back” from ESG obligations for its companies and the EU clarified its position on reporting requirements.

Notwithstanding this, Star Scientific Ltd remains committed to the highest ESG reporting standards, as outlined in our inaugural report, as we believe our customers, investors and staff expect no less. A continued commitment to the highest standards and behaviour, therefore, just makes good business sense.

As we reported last year, one of the difficulties we encounter in striving to conform to the highest standards is that in some cases, especially as they relate to the specific properties of hydrogen and our catalytic processes, the standards do not exist.

To that end, during this reporting period we have remained heavily engaged with both global regulators and, especially in our home country of Australia, local authorities. While at times the progress has been slow, it has nevertheless been a process of discovery for all parties. HERO® has certainly stimulated regulators to “think out of the box” when presented with a process that does not burn hydrogen to extract its energy.

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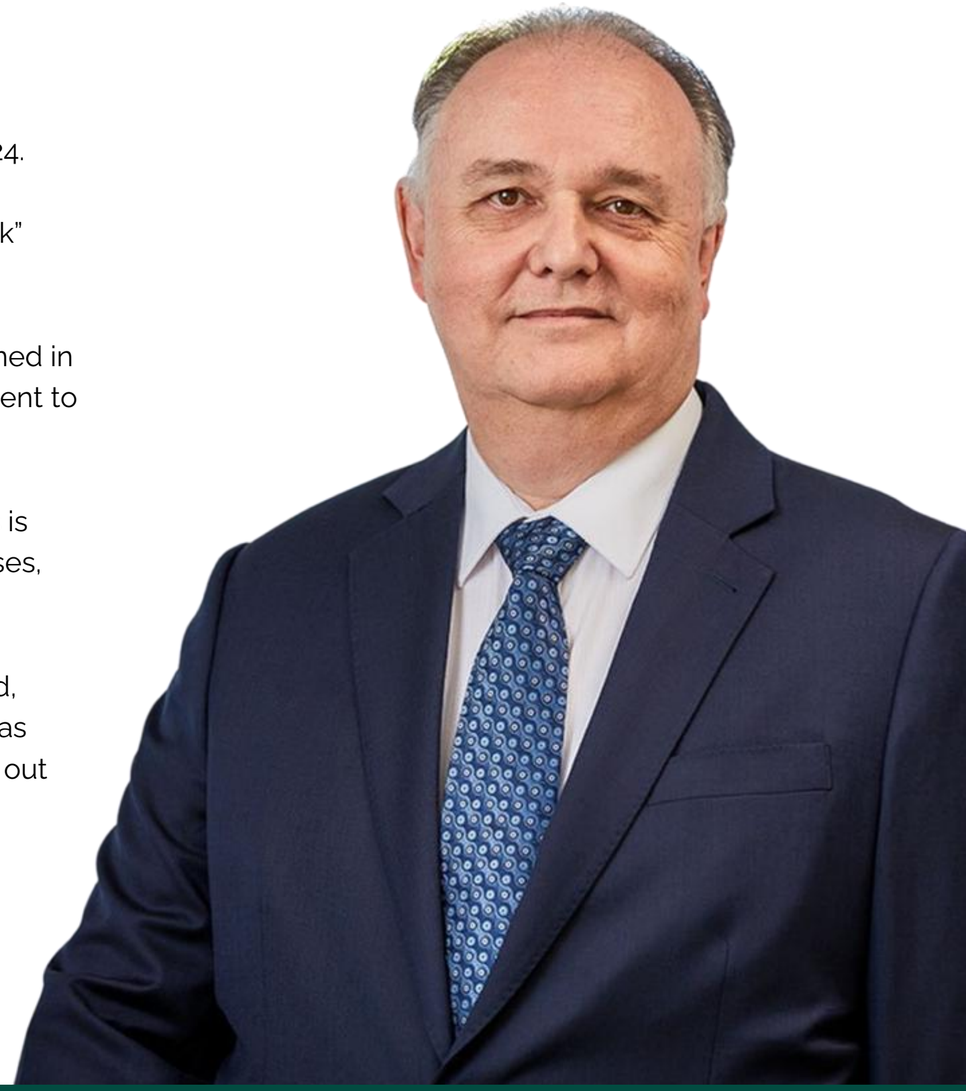


Andrew Horvath
Global Group Chair

MESSAGE FROM LEADERSHIP (cont.)

Over this period, we have also been thinking deeply about the catalytic properties of HERO® and its uses beyond the simple generation of heat. We believe there are some exciting possibilities for further developments that will be added to the suite of sustainability tools for our customers. We will be able to report further in coming reports.

In terms of our own business practices, we continue to evolve them to respond to changing conditions. The exponential growth of Artificial Intelligence is exciting for a scientific research, development and deployment company like Star Scientific Ltd. The demand it is generating for clean energy and systems to supply it also provides wonderful business opportunities for us. Nevertheless, AI presents a range of challenges in areas such as fraud and the protection of intellectual property, and Star Scientific Ltd has prudently invested significant resources in meeting these challenges.

We hope you enjoy this, our second Sustainability Report and we look forward to keeping you updated on further developments.

Andrew Horvath
Global Group Chair

FOREWORD

As noted in the Chairman's foreword above, it has been an interesting period in the world of ESG, with some jurisdictions watering down reporting obligations.

However, we at Star Scientific Ltd have diligently researched the market globally and have found that these actions are somewhat moot. We have found that those companies providing branded products and services direct to customers are still determined to conform to the highest ESG standards. To put it succinctly, they have made promises to their customers and are determined to keep them.

This is driving a relentless search for renewable energy and heat sources that can cover the gap that cannot be electrified.
Over this reporting period we have also seen consumers impacting the demand for clean energy though their rapidly increasing adaptation of Artificial Intelligence. The owners and operators of data centres are "scrambling" to find off-grid sources of energy to meet the stratospherically expanding demand for AI.

Finally, geopolitical factors are still very influential, with many governments driving hard to ensure energy security for their citizens. In most cases it is either explicitly stated or implied that this will be from clean energy sources.

Add these three factors together and it is a very exciting market indeed for Star Scientific Ltd's services. This is why we remain determined to pursue the highest ESG standards. We want our customers to be confident that they will receive, effectively, a double benefit – our services will help them meet their ESG goals, and they can be confident that the services they are purchasing come from a company that is itself ESG compliant.

Matthew Hingerty
Deputy Chair, Deputy CEO and Head of Business Development

POWERING EQUITY: A JUST TRANSITION FOR A SHARED FUTURE

Energy justice is the guiding principle that ensures the transition to net zero benefits everyone. It means making energy affordable and accessible, and acknowledging the voices and needs of those who have historically been negatively impacted by lack of access to sustainable energy.

In 2025, energy justice demands more than policy – it demands action, innovation, and partnership. For us at Star Scientific Ltd we see this moment as an opportunity to lead with purpose:

- **Technology for equity:** Our HERO® technology removes infrastructure and affordability barriers by enabling a clean heat solution for multiple industries – delivered sustainably and locally.
- **Community-first innovation:** We support decentralised systems and circular economies that empower communities to build local economic capacity and create lasting employment.
- **Education for resilience:** The clean energy economy requires long-term investment in people. We are committed to fostering skills and knowledge that support local innovation and self-sufficiency.

We continue our approach to seek out partners who share our commitment within the energy space, believing energy is a universal right. We are determined now more than ever to play our part in making this vision a reality.

In 2024 we witnessed and contributed to multiple conversations over five continents, from governments, big-tech, finance institutions, hydrogen technologies, and local stakeholders that are putting energy access at the forefront of the clean energy transition - for a sustainable future.

The journey continues, and we are proud to report on our progress in building a future that sees no-one held back for the want of access to sustainable energy.

Amy Halliday, MBA
Energy Justice Officer, DBA candidate

ABOUT THIS REPORT

Our 2024 Sustainability Report consists of two main sections:

The first section will briefly introduce you to Star Scientific Ltd and the heat-generating HERO® technology. You will learn about our history to date, mission, leadership team, and the potential of HERO®. Additionally, we will highlight the awards & recognitions we have received, reinforcing our confidence in the path we have chosen.

The second section will cover the main updated topics of Sustainability in line with the ESRS. These standards are a set of rules and requirements for companies to report on sustainability-related impacts, opportunities, and risks under the EU's CSRD. At the end of our Sustainability Report, **an additional section** will address the EU Taxonomy and our updated compliance status with its requirements.

We currently align our sustainability reporting with the principles and structure of the ESRS, reflecting our commitment to robust and transparent disclosure. As Australia introduces its own Sustainability Reporting Standards, published in 2024 and becoming mandatory for certain entities from 2025, we will evaluate their applicability to Star Scientific Ltd and consider their integration into future reporting cycles.

Disclaimer: This report features a curated selection of photographs showcasing our staff, executive leadership, and ongoing R&D activities. Additionally, it includes illustrative images sourced from open-access platforms, which provide stakeholders of the report with a comprehensive view of Star Scientific Ltd's trajectory as we transition into the commercialisation stage.

COMPANY OVERVIEW

Star Scientific Ltd is a hydrogen R&D company committed to creating safe, reliable, and affordable zero-emission energy.

At the heart of our quest for sustainable energy solutions is HERO®.

COMPANY HISTORY

Founded more than 25 years ago by Andrew Horvath, who is now our Global Group Chair, Star Scientific Ltd began its journey with a focus on developing muon-catalysed fusion technology. This early research laid the foundation for a culture of innovation and resilience. The turning point in our history was the breakthrough discovery that led to the development of HERO®. This technology epitomises our approach to innovation, harnessing the power of hydrogen to create energy solutions that are not only sustainable, but also completely emission-free.

COMPANY HISTORY

Through research on nuclear fusion materials, the Star Scientific Ltd team utilised and converted heat-releasing events into the HERO® heat-generating technology

1998 Star Energy Pty Ltd formed as IP holder, with **Andrew Horvath** as Global Group Chairman

2000 Further critical component and material testing. MCF System successfully developed through 7 models.

2007 Name changed to Star Scientific Limited, becoming an unlisted public company. First contained nuclear lab built and radiation license awarded.

2007 – 2013 Testing with various scientists, working on component upgrades and further materials research. **First heat releasing event** happened in 2007 and increased in frequency as the MCF testing progressed.

2013 – 2014 Chief Scientist Stephen Horvath resigned as a director of Star Scientific Ltd at end of 2013 and retired as Chief Scientist at end of 2014, passing his role to Steve Heaton.

1978
Stephen Horvath forms Horvath Energy Australia (HEA) to engineer the Muon-Catalysed Fusion (MCF) system.

2015
Confirmation of a non-nuclear heat releasing catalyst named **HERO®** by Steve Heaton and team.

2016
MCF research put on hold to allow the company to focus on developing HERO® through to commercialisation (recognised as a faster way to market and stop all harmful emissions from power and industrial heat production)

2017
Global patent application process overseen by Norton Rose Fulbright.

Third-party independent test carried out on HERO®.

2018
HERO® was scaled by 600% and bonded to a different shape and it behaved exactly as expected. 2nd test of HERO® carried out and verified it as a surface catalyst that can scale to any shape and surface area.

Many potential industrial applications of the HERO® heat source identified.

2019
5-year lease on a **new facility, located in Berkeley Vale.** Four times bigger than the previous facility.

First small-scale commercial design heat exchanger was constructed and tested.

2021
Memorandum of Understanding (MoU) with Central Coast Industry Connect Ltd to provide food companies with carbon-free heat.

2021
Announcement of the first applied research pilot project of its HERO® technology using hydrogen to provide heat for industrial-scale sanitation with Mars Food Australia.

2022
First partnership with major industrial players

October 2023
Star Scientific Ltd and the Government of the State of New Mexico announced that Star Scientific Ltd had chosen Albuquerque, New Mexico as its preferred location for its first operation in the US.

October 2023
Star Scientific Ltd announced that it was developing a second pilot project for Central Coast packaging company TrendPac.

COMPANY HISTORY

Through research on nuclear fusion materials, the Star Scientific Ltd team utilised and converted heat-releasing events into the HERO® heat-generating technology

The 1st of Jan 2024
Start of the reporting period

April 2024
Star Scientific Ltd was honoured to be visited by Kadri Simson, the EU's Energy Commissioner.

April 2024
Star Scientific Ltd's New Mexico project was one of fifteen projects across the US to receive the Trade and Industry Development Magazine's "Community Impact Award."

TOP 15 Community Impact 2018

HYDROGEN AMERICAS 2024 SUMMIT & EXHIBITION
11 – 12 JUNE 2024
RONALD REAGAN INT. TRADE CENTER, WASHINGTON D.C.

June 2024
Star Scientific Ltd for the 1st time attended the Americas conference of The Sustainable Energy Council.

May 2024
Star Scientific Ltd was presented as part of the huge Australian contingent at the World Hydrogen Summit.

WORLD HYDROGEN 2024 SUMMIT & EXHIBITION
13-15 MAY 2024
ROTTERDAM AHOY, NETHERLANDS

July 2024
Star Scientific Ltd announced that it develops a third pilot program about saline and wastewater treatment.

Global African Hydrogen Summit
3-5 September 2024 | Windhoek, Namibia

September 2024
Star Scientific Ltd attended the African Hydrogen Summit in Namibia, which confirmed the exceptional opportunities for HERO® in Africa.

September 2024
Star Scientific Ltd attended and spoke at the Hydrogen Asia Summit in Singapore.

HAS 2024 Hydrogen Asia Summit
Towards Low-carbon Hydrogen

October 2024
Star Scientific Ltd representatives visited Germany to attend a trade mission organised by the German-Australian Chamber of Commerce and gave a presentation on HERO® to the Stade Chamber of Industry and Commerce in the state of Lower Saxony

The 31st of Dec 2024
End of the reporting period

OUR MISSION

Our Vision

Put the necessary foundations in place to move towards a clean energy future that will improve the lives of people around the world without damaging the environment.

Our Global Presence

In the future, our international offices will not be just strategic touchpoints but centres of innovation and collaboration. Each office will be an integral part of our R&D, ensuring that our solutions and practices can be adapted to different energy markets and environmental challenges around the world.

Our Partners

We are working with industry and government to lay the necessary groundwork to move toward a clean energy future that will improve the lives of people around the world without harming the environment.

Our Commitment to Sustainability

Every step of our operational and strategic activities is aligned with our core values of innovation, safety, and environmental stewardship. From our research laboratories to our offices around the world, our team is united in our commitment to contribute to a sustainable energy economy. We believe that our work not only leads to technological advances but also contributes to a broader transition to sustainable practices worldwide.

OUR CORE VALUES

Don’t force nature

We don’t have to force nature to meet our human needs. We don’t have to destroy it. By deeply understanding the science of nature we can work with it to sustain and enhance our lives. We are, after all, part of nature ourselves.

We all have a right to energy

Access to continuous, stable, safe, affordable energy is a fundamental human right. Nobody should be held in poverty for a lack of energy. Everyone deserves the energy they need to be their best selves.

Everyone has an innovative spark in them

Scientific curiosity lives in every human being, regardless of their sex, their race, their beliefs, their education, or their wealth. No matter your background, if you’re curious about nature and science, you have a place at Star Scientific Ltd.

We all have a right to a secure workplace

We view our staff’s time, energy, and effort as our most precious investment. In return, we will respect their right to a safe, secure, and nurturing workplace.

We will be resilient

Scientific research takes patience and resilience. It involves both success and failure. We will celebrate our successes, face adversity with courage and learn from disappointment.

We will be constantly curious

“Why”?”, “How?” and “What”?” is our mantra. HERO® was born from asking these very questions. We will never stop asking them.

OUR LEADERSHIP TEAM

At the helm of Star Scientific Ltd, a team of visionary leaders steers our mission through sustainable innovation. Each member of our leadership team brings unique expertise and a shared commitment to advancing our technologies and strategies.

Andrew Horvath
Global Group Chair

Andrew founded Star Scientific Ltd over two decades ago and has been a driving force behind its pioneering spirit. As the Global Group Chair, he oversees the business strategy and development, focusing particularly on the advancement and deployment of our breakthrough technology, HERO®. His vision is fundamental in shaping the future of sustainable energy solutions.

Steve Heaton
Global Head of Research

Steve orchestrates our international research efforts, managing a diverse portfolio that spans several continents. He works closely with industry leaders, academia, and government bodies to foster relationships that enhance our technological capabilities and drive forward our research agenda.

Jim Murray
Head of Mass Production

Jim leads the critical initiatives for scaling up the production of our technologies. He is at the forefront of developing and establishing mass production facilities that are capable of meeting the global demand for our innovative HERO® technology, ensuring that our solutions are accessible on a large scale.

Matthew Hingerty
Deputy Chair, Deputy CEO and Head of Business Development

Matthew plays a dual role in strategic planning and business development. He is instrumental in driving support for green hydrogen technologies across various sectors, including business and government. His efforts are key to integrating our solutions into broader energy and sustainability strategies.

Shayne De Courcy
Global Head of Infrastructure

Shayne oversees the infrastructure aspects of our HERO® projects. His responsibilities include ensuring that the necessary physical and logistical infrastructure is in place to support the deployment and operation of our technology across different regions.

OUR BREAKTHROUGH TECHNOLOGY - HERO®

At the forefront of our drive for sustainable energy solutions is HERO®. This innovative technology distinguishes itself by converting hydrogen into heat without combustion, using a proprietary catalyst to initiate a controlled reaction between hydrogen and oxygen.

The process is highly efficient, reaching temperatures above 700°C within minutes. HERO® delivers industrial-scale heat in a flameless and inherently safe manner, making it an ideal fit for a wide range of commercial applications.

HERO® operates on a straightforward yet powerful principle: the greater the catalyst's surface area and the more hydrogen available, the more heat is generated. With pure water as its only by-product, HERO® offers not only exceptional efficiency but also a clean, sustainable energy solution for diverse industrial needs.

HERO® is the world's first and only safe, affordable, non-combusting hydrogen heat solution suitable for:

POWER GENERATION

By swapping HERO® for a coal-fired boiler within an existing power plant, emissions can be cut while power stations can continue to operate. Costs can be reduced by eliminating the need for infrastructure replacement and multi-million-dollar pollution control measures.

DISTRICT HEATING

Heating for buildings like our homes and businesses is one of the largest drivers of carbon emissions. With its ability to safely reach temperatures of over 700 degrees Celsius in just minutes, HERO® can provide efficient and clean district heating; a municipal-level replacement for individual home heating systems.

OFF-GRID POWER

HERO® can be placed in remote communities where it can quickly and reliably generate power at economical costs. HERO® can play a critical role in the developing world, connecting people to clean, reliable power and lifting them out of poverty. HERO® can also anchor off-grid energy systems for energy intensive facilities such as data centres, releasing pressure off local grids.

INDUSTRIAL

Heat production can be one of the most energy intensive parts of the production process for many industries.

HERO® can step in to create a clean, high temperature source of heat to affordably solve this challenge for industry, significantly cutting emissions outputs.

WATER DESALINATION

As demand for desalination rises, concern is also growing that the process must be made more affordable and sustainable. HERO®'s clean, rapid heat generation can enable a more efficient desalination process, creating the clean water needed to sustain life without further harming the environment.

HERO® TECHNOLOGY

Star Scientific Ltd's flagship technology is based on a high yield heat-releasing catalytic reaction that occurs when oxygen and hydrogen meet an innovative catalyst: HERO®.

What is HERO®?

It is a catalytic reaction between Oxygen, Hydrogen and a confidentially kept proprietary catalyst. This revolutionary heat-generating technology can be transformed into reliable energy for multiple uses.

What happens to the catalyst during the reaction?

HERO® catalyst is not consumed nor degraded during the reaction so it can be used over time. This proprietary material isn't technically part of the reaction; it is the home of the reaction.

How can this reaction be monitored?

We have developed our own artificial intelligence system to automatically monitor the heat exchanger so that the exact amount of heat needed is produced for each particular industrial purpose.

HERO® needs hydrogen, how do we make it?

Hydrogen can be produced through various methods. Black or Grey hydrogen can be produced using coal, but it releases carbon. If carbon capture, utilisation and storage (CCUS) is implemented during the process, then this hydrogen is called blue hydrogen. Green hydrogen can also be produced by transforming solar and wind energy into electricity to run electrolysers, which then split water into hydrogen and water. New methods are being researched and promising leads such as the use of photocatalysts and other breakthrough methods of separating hydrogen and oxygen from each other in water will disrupt the market within five years.

Are there any greenhouse gas emission or undesirable by-products?

No, the HERO® reaction doesn't produce any greenhouse gas or particulate emissions. The only by-product is the highest-grade purified water.

What does this reaction create?

The reaction creates an immense amount of controllable heat without combustion. Within 5 minutes it can reach temperatures in excess of 700°C (1,292°F). This heat can be used for any industrial purposes where heat is required.

AWARDS AND RECOGNITION

Star Scientific Ltd's commitment to sustainability, innovation, and excellence in the energy sector has garnered recognition from various prestigious organisations. These awards reflect our dedication to advancing clean energy solutions and our leadership in industrial innovation. We are proud to share some of our notable achievements.

S&P Global Platts
Emerging Technology of the Year 2020

Awarded by S&P Global Platts, this accolade recognises Star Scientific Ltd's groundbreaking work in emerging technology within the energy sector. Our innovative approach to hydrogen technology, which converts hydrogen into heat without combustion, stood out as a transformative solution in the field.

Sustainable Energy Council
World Hydrogen Awards
Industrial Application 2021

This award highlights our successful application of sustainable energy practices in an industrial setting. The Sustainable Energy Council acknowledged our pioneering efforts to integrate hydrogen technology into industrial processes, contributing to a cleaner and more sustainable future.

SXSW Innovation Awards
New Economy Technology 2022

Recognised at the South by Southwest (SXSW) conference, this award celebrates Star Scientific Ltd's significant contributions to industrial innovation. Our development of unique, non-combustive hydrogen energy solutions has positioned us as a leader in transforming industrial energy usage.

FRAMEWORK

Star Scientific Ltd commits to transparency and accountability in our sustainability efforts. To align with these principles and ensure robust disclosure of our ESG practices, this report follows the general structure and principles of the ESRS.

EUROPEAN SUSTAINABILITY REPORTING STANDARDS (ESRS)

Star Scientific Ltd has adopted the ESRS as the framework for our sustainability report. This decision aligns with our commitment to transparency, accountability, and comprehensive sustainability governance.

Why We Use ESRS?

The ESRS are designed to meet the **stringent requirements of the EU regulations** on sustainability reporting. As Star Scientific Ltd operates within and interacts with the European market, complying with these standards is crucial. It ensures we meet both current and future legal expectations, avoiding potential regulatory penalties and enhancing our market integrity.

By adopting ESRS, Star Scientific Ltd would like to grow in compliance with these regulations, facilitating easier regulatory navigation with both current and upcoming regulatory demands.

ESRS provides a comprehensive set of standards that cover all key aspects of sustainability reporting. This framework enables us to provide a detailed account of our practices, impacts, and performance in areas critical to our stakeholders, such as environmental integrity, social responsibility, and corporate governance. This enables us to improve our reporting as we go along.

The table below presents the relevance of various ESRS topics to Star Scientific Ltd. In 2024, as we are in the R&D stage (TRL 6), not all topics are directly applicable. However, we have included them in our Sustainability Report to ensure comprehensive awareness of the impacts our activities may have now and in the future. As we advance towards commercialisation (TRL 9), future reports will incorporate a double materiality assessment to further refine our sustainability focus.

Group of Standards	Subject	Relevance for the 2024 Sustainability Report	Relevance for the 2028* Sustainability Report
Cross-cutting	General requirements	+	+
	General disclosures	+	+
Environment	E1. Climate change	+	+
	E2. Pollution	+	+
	E3. Water and marine resources	+/-	+
	E4. Biodiversity and ecosystems	+/-	+
	E5. Resource use and circular economy	+	+
Social	S1. Own workforce	+	+
	S2. Workers in the value chain	+/-	+
	S3. Affected communities	+/-	+
	S4. Consumers and end users	+/-	+
Governance	G1. Business conduct	+	+

* The year 2028 is projected in this table as the potential year when Star Scientific Ltd will be an international operational company, with multiple projects across various countries and regions.

DOUBLE MATERIALITY ASSESSMENT

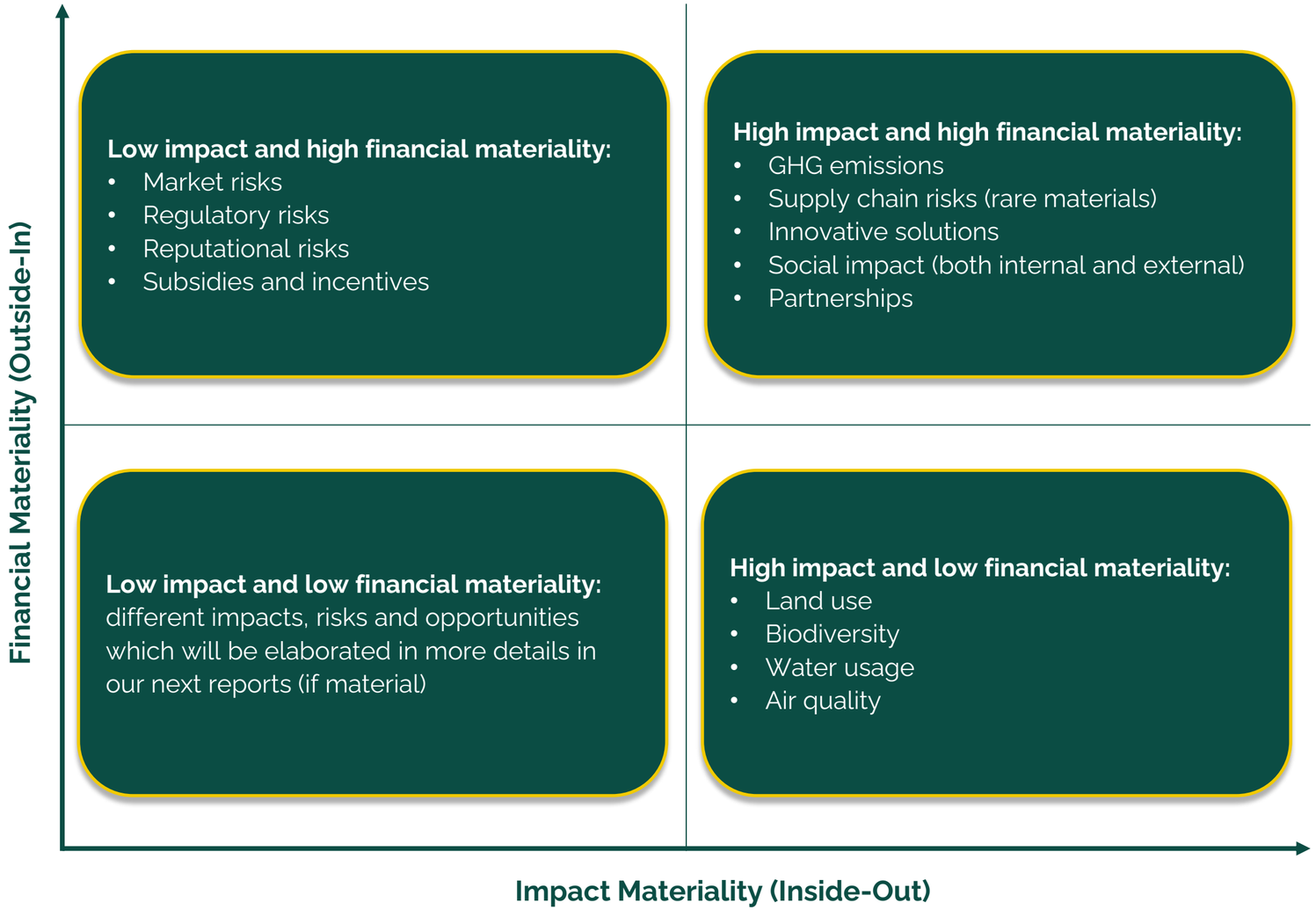
In accordance with the CSRD, companies are required to apply the principle of **double materiality** as the foundation for their sustainability disclosures.

Double materiality comprises two key dimensions:

- **Impact materiality (Inside-Out):** assesses the actual or potential, positive or negative impacts of the company's activities on ESG factors over the short, medium, and long term;
- **Financial materiality (Outside-In):** evaluates whether a sustainability matter could materially affect the company's financial performance, position or development.

Star Scientific Ltd is currently in the R&D phase (TRL 6), as such, a full double materiality assessment – particularly in relation to future commercialisation stage (TRL 9) – is not yet feasible.

Nonetheless, we recognise the importance of initiating this process early. The preliminary approach presented on this slide marks our first step toward embedding double materiality into our sustainability strategy and reporting practices.



ENVIRONMENT

We embrace our responsibility to the planet by leading the way toward a future where energy production coexists in harmony with nature. As a pioneer in hydrogen technology research and development, we understand the critical role we play in advancing a sustainable energy economy. At the centre of this mission is our core innovation, HERO® - a revolutionary technology that generates heat without combustion, effectively eliminating emissions at the source.

Our commitment to environmental sustainability stems from a strong belief that businesses have a crucial role to play in combating climate change and preserving natural resources for future generations.

This conviction has guided our operations, research, and product development for over 25 years, orienting us towards solutions that are not only innovative but also inherently sustainable.

In navigating the path to sustainability, we strive for continuous improvement, guided by rigorous environmental management strategies and adhering to global standards and best practices. We strive to minimise our environmental impact through a comprehensive approach that includes emissions reduction, energy efficiency, water conservation, and waste management. Every step we take is aimed not only at reducing our environmental impact but also at setting new benchmarks for what is possible in sustainable energy.

This section of our sustainability report describes our environmental management strategy, activities, achievements, and goals. It reflects our ongoing efforts to integrate environmental considerations into every aspect of our operations from the outset. By transparently communicating our journey, we aim to inspire action, foster collaboration, and contribute to a more sustainable world.

Our Environmental Commitment

At Star Scientific Ltd, our concern for the environment goes beyond the innovative applications of HERO®. It permeates every facet of our operations – from the communities where our products are used to the places where they are crafted. We believe that true sustainability begins at the source — with the development and production of our technologies.

E1. CLIMATE CHANGE

At Star Scientific Ltd, we recognise the significant impact of climate change on our planet and humanity. Committed to our mission of pioneering zero-emission energy solutions, we actively participate in global efforts to mitigate climate change through innovative technologies and sustainable practices.

E1. CLIMATE CHANGE

GHG EMISSIONS

SCOPE 1

HERO® stands at the forefront of Star Scientific Ltd's commitment to combating climate change. Unlike conventional energy sources, HERO® generates zero greenhouse gas emissions, offering a substantially lower environmental impact. This innovative technology employs a proprietary catalyst to convert hydrogen into heat without combustion, resulting in an exceptionally clean energy process.

As HERO® remains in the R&D phase, complete data on Scope 1 emissions from our operations is not yet available. Nevertheless, preliminary evaluations suggest that even at scale, HERO®'s environmental benefits will significantly outweigh the emissions associated with its production and deployment.

SCOPE 2

We believe that all companies that have the opportunity to do so have a responsibility to maximise the generation and use of renewable energy. With growing strain on the power grid, this also makes good business sense in terms of reducing business risks. Our long-term goal is energy self-sufficiency, supplemented by 100% certified green energy from the grid when and if needed. During the reporting period, our Berkeley Vale facility used 100% certified green energy.

100% Green Energy Usage: As of 1st March 2024, Star Scientific Ltd has fully transitioned to using renewable energy sources across all operations. This shift is part of a broader strategy to minimise our environmental impact and support the global transition to sustainable energy.

Energy Agreement Details: Our current agreement to source 100% renewable energy began on 1st March and will continue until the end of September 2025. This agreement covers all facilities operated by Star Scientific Ltd globally, ensuring that our commitment to zero emissions extends beyond our product offerings.

Renewal Plans: The agreement is set to be renewed beyond September 2025, reflecting our long-term commitment to green energy and sustainability.

E1. CLIMATE CHANGE
GHG EMISSIONS

SCOPE 3

Scope 3 emissions encompass a wide range of indirect emissions that occur in Star Scientific Ltd's value chain. These include emissions from activities such as business travel, waste disposal, product transportation, and the lifecycle emissions of products and services. Although comprehensive data collection for Scope 3 emissions is still in progress, we recognise the importance of understanding and mitigating these impacts as part of our overall sustainability strategy.

Quantifying Scope 3 emissions is inherently complex, but Star Scientific Ltd is actively working to address these challenges as part of our environmental responsibility. By developing a thorough understanding of our indirect emissions, we aim to make informed, strategic decisions that reinforce our commitment to a sustainable future.

Future Plans: Star Scientific Ltd is dedicated to developing a robust framework for managing Scope 3 emissions, including the following:

1. Data Collection and Reporting
We aim to establish comprehensive data collection mechanisms to quantify Scope 3 emissions accurately. This will involve engaging with our supply chain to track emissions from upstream and downstream activities

2. Supplier Engagement
We plan to work closely with our suppliers to encourage sustainable practices and reduce the carbon intensity of our supply chain. This includes promoting the use of eco-friendly materials and processes

3. Lifecycle Assessment
As part of our commitment to sustainability, we will conduct lifecycle assessments of our products and services to identify key areas for emission reductions and improvements in environmental performance

4. Continuous Improvement
We will set targets for reducing Scope 3 emissions and regularly review our progress. This commitment to continuous improvement will ensure that we stay aligned with best practices and emerging standards in sustainability reporting

E1. CLIMATE CHANGE

AVOIDED EMISSIONS THROUGH HERO®

At Star Scientific Ltd, we are dedicated to our mission of leading the way in zero-emission energy solutions with HERO®. In doing so, we actively support global efforts to combat climate change through our innovative technologies and sustainable practices.

Currently, we are in the RD&I stage. To demonstrate the potential impact on reducing emissions, we are pleased to share data from our pilot project. The following section outlines the anticipated total carbon emissions reduction, based on **three main steps**:

1. **Understanding the total carbon footprint of the materials which will be used by Star Scientific Ltd for the trial project.**
2. **Justifying the non-occurrence of the carbon emissions during the HERO® heating process.**
3. **Calculating how much of the client's carbon intensity will be reduced by using HERO®.**

It is important to note that, due to the Non-Disclosure Agreements we have signed, the information and data in this report are presented as final results. If initial or raw data is required, it can be provided upon official request from authorised entities.

STEP 1. UNDERSTANDING THE TOTAL CARBON FOOTPRINT OF THE MATERIALS USED

Step 1.1. Breakdown of the materials used

The table provides the weights of the materials used to construct the HERO® heat exchanger, designed to deliver the required output for the client's installation in the trial project.

Materials	Weight, kg
Stainless Steel 316	819.5
Total catalyst materials	12.5
Titanium	0.73
Garlock 9450 Gasket (PTFE)	4.8
Total	**837.53**

Step 1.2. Calculation of the catalyst materials' carbon footprint

As the specific combination of materials in the catalyst, including their weights and proportions, is protected by intellectual property, we utilise the total weight of the catalyst for this analysis. The carbon footprint data for the most carbon-intensive material is applied accordingly. According to the HERO® patent, the primary materials used for the catalyst are steel, zinc, copper, nickel, and tin. Based on available open-source information, the table presents the carbon footprint per kilogram for each of these materials.

Materials of the catalyst	Carbon footprint per 1 kg of the material, kg of CO_2(e)	Source of the information
Steel	1.91	World Stainless Association
Zinc	3.89	International Zinc Association
Copper	4.1	International Copper Association
Nickel	**13.0**	**Nickel Institute**
Tin	6.632	International Tin Association

Step 1.3. Understanding the total carbon footprint

Based on the information from the previous steps and data from the open sources, the total carbon footprint of the materials used in the HERO® system for the pilot project is calculated to be 5.81 tonnes of CO_2(e). Please note that these numbers do not include the carbon footprint of transportation, as we, as an RD&I company, do not contract directly with the material producers. We assure you that, in selecting suppliers, we will make every effort to minimise (or eliminate) the carbon footprint associated with transporting materials to our premises.

Materials of the catalyst	Weight, kg	Carbon footprint per 1 kg of the material, kg of CO_2(e)	Total carbon footprint per material used, t of CO_2(e)
Stainless Steel 316	819.5	6.82 [1]	5.59
Total catalyst materials	12.5	13.0 [2]	0.16
Titanium	0.73	17.0 [3]	0.01
Garlock 9450 Gasket (PTFE)	4.8	9.6 [4]	0.05
Total	**837.53**		**5.81**

[1] World Stainless Association
[2] Data for the most carbon intensive material from the catalyst (Nickel)
[3] https://www.californiametals.com/
[4] https://shamrocktechnologies.com/

STEP 2. JUSTIFYING THE NON-OCCURRENCE OF THE CARBON EMISSIONS DURING THE HERO® HEATING PROCESS

In July 2024 two demonstrations of our technology, HERO®, were designed to verify that no other gases other than the hydrogen fuel, the oxygen oxidant, and an inert carrier gas (argon) were used in the system. Samples of the input and output gases were collected and analysed by two independent analytical services companies. Additionally, a scientific overview and explanation letter was prepared for and received by Star Scientific Ltd, detailing the results of these demonstrations. The results show that no common greenhouse gases were either being input into the system, nor emitted from the system. **Greenhouse gases such as carbon dioxide (CO_2), carbon monoxide (CO), methane (CH_4), and nitrous oxide (N_2O) were not present anywhere within the system.** The only other gases present were hydrogen (H_2) and oxygen (O_2), which are the reactive gases within the system.

It is important to note, that due to the Non-Disclosure Agreements we signed, initial and raw data can be provided additionally upon official request from authorised entities.

STEP 3. CALCULATING HOW MUCH OF CARBON INTENSITY WILL BE REDUCED BY USING HERO® TECHNOLOGY

As reflected in the letter of intent, the pilot project's primary goal is to replace natural gas power installations with HERO® in our client's operations. The project will begin with an initial phase where 15% of the natural gas carbon intensity will be removed. After approximately 2-3 months, the project will transition into a full commercial contract, aiming to remove 100% of the natural gas carbon intensity.

HERO® has the potential to eliminate between 359.48 tonnes of CO_2(e) per year to 2,396.5 tonnes of CO_2(e) depending on the level of usage (from 15% to 100% per year).

Considering the total carbon footprint of the materials used (Step 1.3) projected as 5.81 tonnes of CO_2(e), **the final level of carbon footprint mitigation by using HERO® ranges from 98.4% to 99.8%** depending on levels of usage (from 15% to 100% per year).

Please note that initial and raw data can be provided additionally upon official request from authorised entities

E2. POLLUTION

At Star Scientific Ltd, we are deeply committed to minimising our environmental impact by focusing on pollution management and reduction in all areas of our business. This commitment is reflected in our rigorous pollution control practices, adherence to environmental standards, and active participation in pollution prevention strategies.

E2. POLLUTION

CURRENT POLLUTION MANAGEMENT PRACTICES

Liquid Waste Management

Our approach to liquid waste management is thorough and compliant with local regulations about neutralisation of laboratory waste.
Liquid waste from our laboratory is neutralised before local disposal into the sewerage system. This process has been approved by the local Council and is subject to periodic inspection to ensure compliance.

Hazardous Waste Disposal

Hazardous waste, which falls outside local disposal limits, is handled by a certified commercial waste company. This ensures that such waste is managed in an environmentally responsible manner.

Dissolved Metals Extraction

We employ an extraction method to remove dissolved metals from our liquid waste, both for their commercial value and environmental reasons. While not achieving complete removal, this process significantly reduces the presence of metals in our waste.

We have a workshop wastewater treatment. Trace oils or metal particles in wastewater from the workshop are removed using a baffle and sump system prior to disposal into the sewerage system, ensuring that harmful substances do not contaminate the local water supply.

Future Considerations

Looking ahead, Star Scientific Ltd is exploring advanced technologies and processes to further reduce our pollution footprint:

- **Research and Development:** Our ongoing R&D efforts focus on developing more efficient and less pollutive technologies, especially in the area of hydrogen energy conversion, which inherently offers a cleaner alternative to traditional energy sources.
- **Sustainability Planning:** As part of our commitment to future sustainability, we plan to integrate more robust pollution control technologies and practices as we expand our operations internationally by 2028.

Impact and Sustainability Goals

Star Scientific Ltd's approach to pollution management is not just about compliance; it is about leadership in sustainability. By continuously improving our pollution control measures and investing in cutting-edge technologies, we aim to set industry benchmarks for environmental responsibility. Our ultimate goal is to achieve minimal to zero pollution across our operations, align with global efforts to combat environmental degradation, and promote a sustainable future.

E3. WATER AND MARINE RESOURCES

Our integrated water management strategy aims to minimise our water footprint, improve water efficiency, and ensure sustainable water use in line with our environmental objectives.

E3. WATER AND MARINE RESOURCES

Operational Efficiency

We work closely with property management to promote water conservation measures and ensure that our operations maximise the efficient use of water. We promote water conservation awareness among employees through training and engagement programs to encourage wise water use.

Future Considerations

As Star Scientific Ltd looks ahead to future expansion and the potential acquisition of owned facilities, we are committed to incorporating advanced water management solutions – such as rainwater harvesting and on-site treatment systems – to further reduce our environmental impact and strengthen water resilience.

Even within our current leased premises, we remain dedicated to responsible water stewardship. By prioritising efficient and sustainable water use, we continue to align our practices with our broader sustainability objectives.

Water Consumption

Date	Usage (kl)
1st Quarter 2024	32
2nd Quarter 2024	171
3rd Quarter 2024	63
4th Quarter 2024	1,350
Total 2024	**1,616**
For the reference:	
1st Quarter 2025	*633*
2nd Quarter 2025	*34*

E4. BIODIVERSITY AND ECOSYSTEMS

As part of Star Scientific Ltd's commitment to sustainability and environmental responsibility, this section provides an overview of our impact on biodiversity and ecosystems. We recognise the critical role that healthy ecosystems in conserving biodiversity and sustaining life.

E4. BIODIVERSITY AND ECOSYSTEMS

Biodiversity and Ecosystem Conservation

As Star Scientific Ltd continues to grow and expand its operations, the construction of facilities, including buildings and other infrastructure, will be an integral part of our development strategy. Recognising the potential impact these activities may have on local ecosystems and biodiversity, we are committed to not only complying with all regulatory standards but also to striving for a net positive environmental impact.

Our Approach to Biodiversity

Compliance and Beyond: While adhering to all relevant environmental regulations is a given, our ambition goes further. We aim to exceed baseline compliance by integrating biodiversity considerations into our project lifecycle.

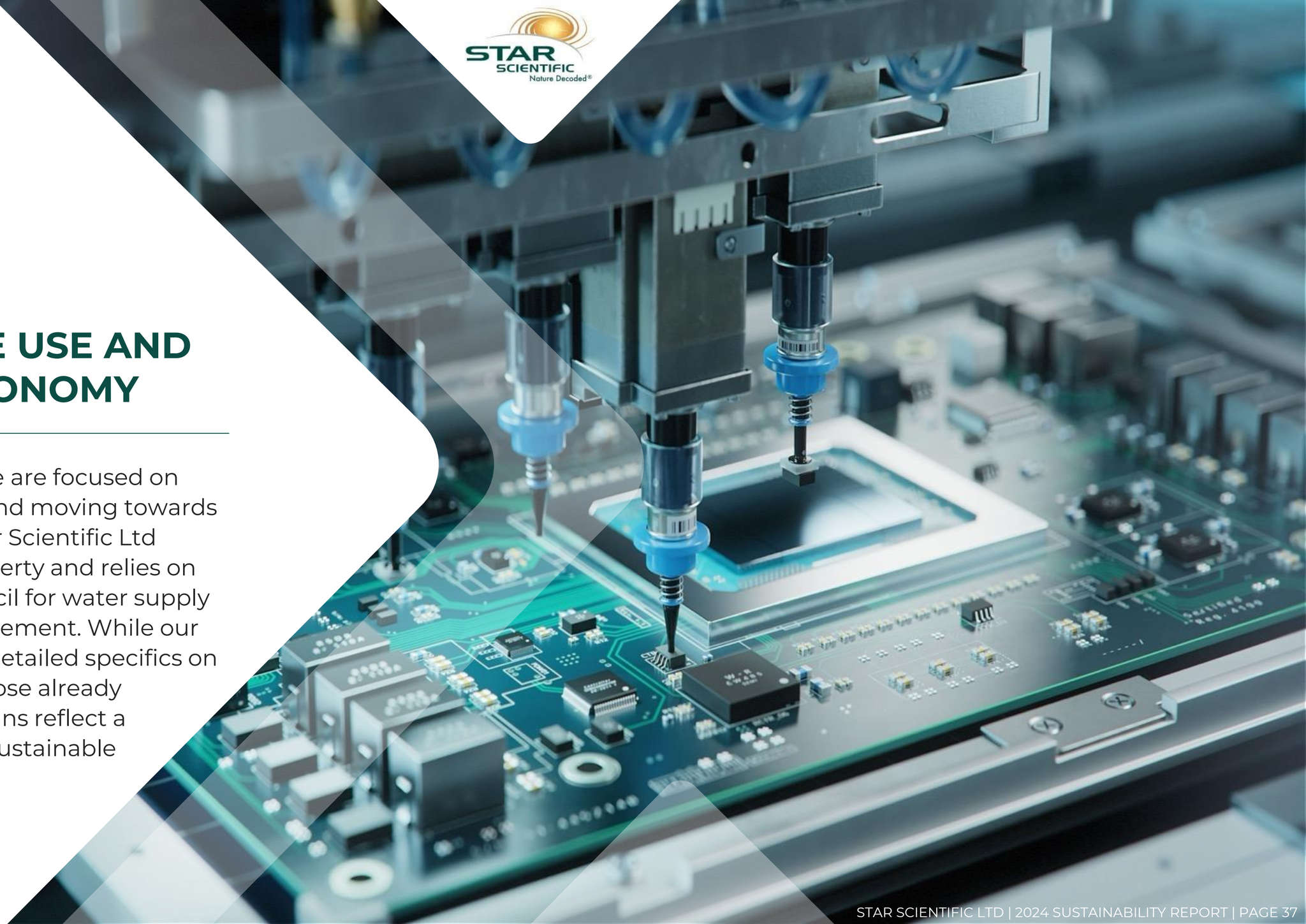
Ecological Rehabilitation and Remediation: Our commitment to biodiversity encompasses proactive measures to restore and enhance ecosystems. For any habitat that may be disturbed by our activities, we will engage in ecological rehabilitation efforts. This includes restoring native vegetation, enhancing habitats for local wildlife, and implementing sustainable land management practices.

Impact Assessments: Prior to any development, comprehensive environmental and biodiversity impact assessments will be conducted. These assessments will identify potential risks and opportunities for biodiversity enhancement, ensuring that our projects are designed and executed with minimal ecological disruption.

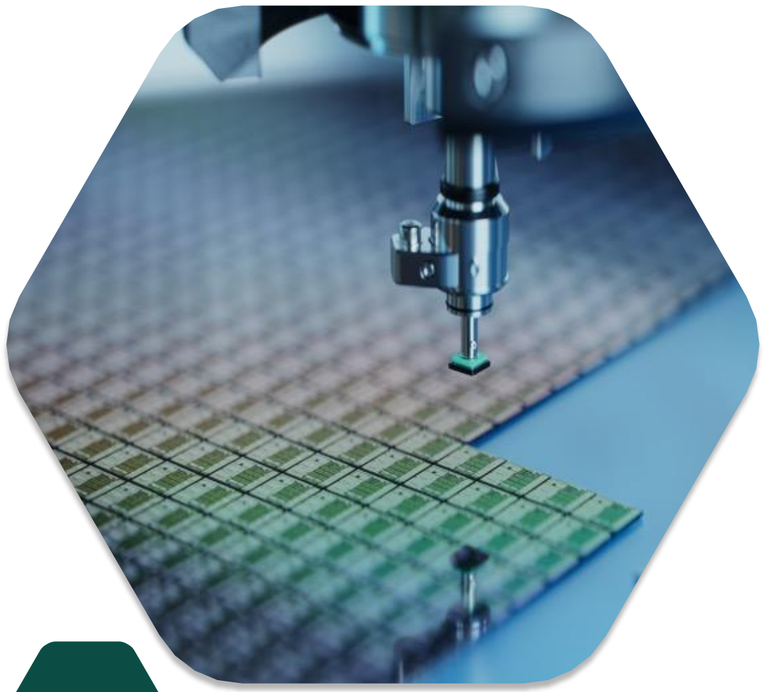
Sustainable Design and Construction: We will adopt sustainable construction practices that minimise habitat destruction and promote biodiversity. We plan on collaborating with environmental experts and local communities to enhance our understanding and management of biodiversity impacts. By leveraging external expertise, we can ensure that our strategies are scientifically sound and community-focused. Our comprehensive water management strategy is designed to minimise our water footprint, enhance water efficiency, and ensure sustainable water use that aligns with our environmental goals.

E5. RESOURCE USE AND CIRCULAR ECONOMY

At Star Scientific Ltd, we are focused on resource stewardship and moving towards a circular economy. Star Scientific Ltd currently leases its property and relies on the Central Coast Council for water supply and wastewater management. While our current location limits detailed specifics on water usage beyond those already disclosed, our future plans reflect a proactive approach to sustainable water management.



E5. RESOURCE USE AND CIRCULAR ECONOMY



Water Resource Management

Our forthcoming purpose-built facility has been designed with sustainability as a central focus. A key feature of this design is the integration of rainwater harvesting systems for potable use, complemented by on-site water treatment and reticulation systems to support industrial operations. This strategy is intended to significantly reduce and potentially eliminate reliance on imported (purchased) water.

By capturing and treating water on-site, we not only lower our environmental impact but also enhance our operational resilience and self-sufficiency in water management.

Waste Management and Circular Economy Initiatives

As Star Scientific Ltd transitions to owning its facilities, we are implementing significant enhancements in waste management. Our strategy includes setting clear waste reduction targets and designing infrastructure that supports these objectives. A key feature of our new facility will be advanced systems for monitoring waste generation, enabling more accurate tracking, improved management practices, and ongoing progress in reducing waste.

By prioritising both sustainable water use and advanced waste management, we are actively contributing to the circular economy. These initiatives not only ensure compliance with regulatory standards but also position Star Scientific Ltd as a leader in environmental responsibility within the energy sector. Our forward-looking approach reflects a deep commitment to minimising environmental impact and driving sustainable innovation.

E5. RESOURCE USE AND CIRCULAR ECONOMY

Waste Management

At Star Scientific Ltd, we commit to implementing sound and responsible waste management practices that align with our mission to create sustainable, zero-emission energy solutions. Our approach to waste management is comprehensive and is based on the principles of reducing environmental impact, maximising resource recovery and ensuring regulatory compliance.

Disposal of Hazardous Waste:

While most of our chemical waste can be safely treated and disposed of on-site, a small portion that exceeds local disposal limits or poses a significant hazard is handled with great care. To dispose of such materials, we partner with certified commercial chemical waste disposal companies. These companies are equipped to process and dispose of hazardous substances according to strict environmental and safety standards, ensuring that our waste will not have a negative impact on the environment.

Chemical Waste Management

We actively reduce the reactivity and volatility of our chemical waste by neutralising acids and alkalis. This process involves adjusting the pH of these substances to neutral levels, minimising their corrosivity and potential hazards. Once neutralised, the waste is evaluated to ensure it meets local disposal regulations and then safely discharged into the sewer system. This careful handling reduces the risks associated with chemical waste and supports safe environmental practices.

Extraction of Dissolved Metals

In addition to recycling standard chemical waste, we have implemented an extraction process to remove dissolved metals from our waste streams. This not only combats potential environmental contaminants but also allows us to extract metals that can be reused or sold. While our extraction method does not completely remove dissolved metals, it significantly reduces their concentration by capturing a significant percentage. This approach reflects our commitment to resource efficiency and our proactive stance on minimising our environmental impact.

SOCIAL

At Star Scientific Ltd, we believe that our responsibility goes **beyond pioneering sustainable energy solutions**. It includes a commitment to making a positive impact on the communities we serve and the environments in which we operate. Social responsibility is an integral part of our mission, guiding our engagement with employees, partners, customers, and society.

Our commitment to social sustainability stems from a deep understanding that true innovation thrives in a culture that values human dignity, diversity, equity, and mutual respect.

This section outlines our holistic approach to creating a safe, inclusive, and empowering workplace, supporting surrounding communities, and embedding social equity and human rights into our business practices.

As we navigate an increasingly complex global environment, we remain committed to strengthening our social initiatives and deepening engagement with all stakeholders. Through **transparent reporting, continuous improvement, and meaningful collaboration**, we strive not only to meet expectations but to set new standards as an emerging leader in sustainable energy.

The following pages highlight our strategies, accomplishments, and future goals across key areas such as employee wellbeing, consumer protection, community involvement, and ethical governance. Each component of our social responsibility framework is designed to foster a more equitable and sustainable future – ensuring that our growth is matched by a positive and lasting impact on society.

S1. OWN WORKFORCE

We recognise that our employees are our most valuable asset. This section is dedicated to our own workforce and details our efforts to support, develop, and empower each member of our team. Our goal is to create a work environment that not only fosters innovation and productivity but also maintains the highest standards of ethical behaviour and respect for individual rights. We strive to ensure that Star Scientific Ltd is not just a place to work, but a place where careers flourish and personal growth is encouraged.

S1. OWN WORKFORCE

Diversity and Inclusion

Since our inception, Star Scientific Ltd has been committed to cultivating a workplace that values every individual and embraces diversity of thought, engagement, and productivity. We are dedicated to treating all employees with fairness, respect, and impartiality. Employment decisions are based solely on merit, and we strive to maintain a positive work environment that encourages strong relationships and respects a wide range of backgrounds and perspectives.

We aim to reflect the diversity of the world we serve by welcoming individuals from all walks of life. This rich mix of experiences and viewpoints strengthens our organisation, driving motivation, performance, and innovation.

Employee Demographics

Gender	No.
Female	7
Male	15
Total	**22**

Office	No.
Gordon	6
Berkeley Vale	16
Total	**22**

Health and Safety

Through comprehensive Job Safety Analyses and Risk Assessments, we ensure that all workplace activities are carefully evaluated for potential hazards, with appropriate control measures implemented to protect our employees. These assessments are reviewed twice a year or whenever significant changes occur in the workplace, ensuring they remain current and effective.

Our Health and Safety Policy promotes open communication and active participation across all levels of staff on safety-related matters. This policy fosters a culture where safety concerns can be openly discussed and addressed through structured consultation, reinforcing our commitment to a safe, compliant, and collaborative work environment.

Work-life balance

We believe that a healthy work-life balance can support the physical, emotional and mental health of our employees. To this end, we have introduced a 4-day work week and 5 weeks of vacation.

Training and Development

We provide comprehensive training programs that include safety training, leadership and professional development to ensure our employees are well prepared to perform their duties safely and effectively. Employees are encouraged to advance their careers through internal promotions and management support, fostering a culture of professional growth and continuous learning.

S2. WORKERS IN THE VALUE CHAIN

We recognise the importance of maintaining high standards and ethical practices throughout our supply chain, even though our direct interaction with employees in the value chain is currently limited. This section describes our commitment to responsible sourcing and engagement with suppliers. As the company grows, we are dedicated to strengthening oversight and improving the well-being of all workers involved in our operations.

S2. WORKERS IN THE VALUE CHAIN

Current situation

At Star Scientific Ltd, we are committed to upholding the highest standards of ethics and responsibility across our supply chain. To support this, we have implemented a comprehensive Supply Chain Policy that reinforces our dedication to responsible sourcing and meaningful supplier engagement.

This policy ensures that our suppliers align with the same principles of quality, safety, and ethical conduct that guide our own operations. It addresses key areas such as labour rights, environmental sustainability, and adherence to legal and regulatory obligations.

As we continue to grow, we are placing increased focus on the well-being of workers throughout our value chain. This includes strengthening our oversight and deepening engagement with suppliers to ensure compliance with our rigorous standards. We recognise that a responsible, ethical supply chain is essential to achieving long-term, sustainable success.

Future Developments

In the future, as we expand our operations and deepen our relationships with suppliers, we plan to:

- **Increase Supplier Audits:** Conduct regular audits of our suppliers to ensure compliance with our supply chain policy, regulation, and identify areas for improvement.
- **Enhance Worker Welfare:** Focus on the welfare of workers in our supply chain by promoting fair labour practices and safe working conditions.
- **Foster Collaboration:** Work collaboratively with our suppliers to implement best practices and drive continuous improvement in supply chain management.
- **Promote Transparency:** Increase transparency in our supply chain operations by sharing our policies and progress with stakeholders.

By taking these steps, Star Scientific Ltd aims to strengthen our supply chain management and ensure that our values of integrity, quality, and sustainability are reflected throughout our value chain. This proactive approach will not only enhance our operational resilience but also contribute to the overall well-being of the employees who play a critical role in delivering our innovative solutions to the market.

S3. AFFECTED COMMUNITIES

At Star Scientific Ltd, we deeply value our relationships with the local communities where we operate. Our Berkeley Vale facility in the Central Coast region serves as a prime example of our commitment to being a responsible and active member of the community. We recognise the impact our presence and activities can have on these communities, and we strive to build positive and lasting relationships built on trust, transparency, and mutual respect.

S3. AFFECTED COMMUNITIES

Community Engagement and Involvement

We are proud to be active members of several local business associations in the Central Coast region. These affiliations help us maintain a strong community presence and foster meaningful engagement. Through our involvement, we participate in local events, support community-driven initiatives, and collaborate with a wide range of stakeholders – including regulators, business leaders, and community members.

Ongoing Communication

Maintaining open and transparent communication with the community is a priority for us. We use both formal and informal feedback channels to better understand our local impact and reputation. This includes regular engagement with local business associations, community leaders, and residents.

We actively encourage feedback through the contact details provided on our website, allowing stakeholders to share their thoughts, concerns, and suggestions directly. This input is invaluable in helping us assess how we are perceived and identify areas for improvement. Whether it's addressing environmental concerns, exploring ideas for community initiatives or responding to local needs, we take all feedback seriously and act accordingly.

Our goal is to remain proactive in responding to community concerns and to continuously adapt our strategies to reflect local expectations and priorities.

Current Impact

To date, our operations at Berkeley Vale have had minimal environmental impact on the local community. This has been supported by consistent community feedback and the absence of formal complaints or concerns. Given this low level of impact, we have not yet implemented formal environmental monitoring systems specifically focused on community-related effects.

Future Monitoring Systems

As we prepare to scale our operations and begin construction of new facilities, we recognise the importance of implementing more structured and proactive monitoring systems. These systems will be developed collaboratively with our internal ESG team and external ESG advisors to ensure they are robust, effective, and aligned with best practices.

Their purpose will be to identify and mitigate any potential impacts on the local community, reinforcing our commitment to responsible growth and corporate citizenship. Our approach will be guided by leading ESG management principles, including the adoption of comprehensive environmental and social management systems tailored to the unique needs of the communities in which we operate.

We will also continue to align our practices with both local regulatory requirements and international standards, ensuring our operations remain transparent, accountable, and sustainable as we expand.

S4. CONSUMERS AND END USERS

Star Scientific Ltd is committed to ensuring the safety and quality of our production processes, which is paramount in delivering reliable and safe products to our consumers and end users.

S4. CONSUMER AND END USERS

Safety and Quality Assurance

To ensure the safety and quality of our production processes, Star Scientific Ltd has adopted the AS/NZS ISO 45001 and AS/NZS ISO 9001 standards. These internationally recognised frameworks provide a solid foundation for managing occupational health and safety, as well as quality assurance across our operations.

Our commitment to these standards is demonstrated through the initiation of independent assessment and certification processes, which will be finalised as HERO® moves into the deployment phase. By aligning with these standards, we uphold the highest levels of safety and quality, further supported by our compliance with the NSW Work Health and Safety Act 2011 and Regulation 2017.

Customer Feedback and Engagement

Understanding and responding to the needs of our end users is central to our customer-focused approach. Upon deployment of HERO®, Star Scientific Ltd will fully implement the AS/NZS ISO 9001 standard, which includes specific provisions for gathering and addressing customer satisfaction feedback (Section 9.1.2).

This structured approach will enable us to collect meaningful insights from our customers, driving continuous improvement in our products and services and ensuring we consistently meet user expectations.

Mechanisms for End User Feedback and Engagement

To facilitate effective communication and feedback from our end users, Star Scientific Ltd has established several mechanisms:

Customer Support Channels:

We provide customer support channels, including phone and email support, to assist end users with any inquiries or issues they may encounter.

Customer Satisfaction Surveys:

Regular customer satisfaction surveys will be conducted to gather comprehensive feedback on our products and services.

Social Media Platforms:

We can actively engage with our current and potential customers through various social media platforms, allowing for real-time interaction and feedback.

GOVERNANCE:
G1. BUSINESS CONDUCT

We believe that robust governance and ethical business conduct are the foundation of our success and reputation. This section describes our governance structures, policies and practices that guide our operations and ensure accountability at all levels. We are committed to maintaining the highest standards of integrity and transparency in our dealings with all our stakeholders.

G1. BUSINESS CONDUCT

Code of conduct

Star Scientific Ltd commits to maintaining the highest standards of integrity and corporate governance practices to maintain excellence in its daily operations, and to promote confidence in our governance systems.

Our Code of Conduct serves as a guide to proper business conduct for all our employees. It seeks to deter wrongdoing and promote:

- **Honest and Ethical Conduct**, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships.
- **Full, Fair, Accurate, Timely, and Understandable Disclosure:** in reports and documents that we file with, or submit to, regulatory agencies and in other public communications.
- **Compliance with Applicable Governmental Laws, Rules and Regulations:** committing to protection against unlawful retaliation for those who come forward with information related to legal or regulatory non-compliance.
- **Prompt Internal Reporting of Violations of the Code:** supporting system-wide integrity and fostering a culture of transparency, integrity, and honesty.
- **Accountability for Adherence to the Code:** ensuring consistent application of ethics across all levels of the organisation, with mechanisms to address the inevitability of violations or concerns effectively.

Risk Management

Effective risk management is a cornerstone of our governance framework. The Board of Directors plays an active role in overseeing the identification and mitigation of risks that could affect our operations and strategic direction. We have established robust processes to proactively manage these risks, ensuring resilience and long-term stability.

Star Scientific Ltd's governance structure is purpose-built to support our mission: delivering safe, cost-effective, and zero-emission energy solutions that meet today's needs without compromising the future. Our Board, comprised of individuals with diverse expertise and a strong commitment to ethical leadership, provides strategic guidance to drive sustainable growth.

As we continue to evolve, we remain firmly committed to upholding the highest standards of governance, transparency, and integrity in all aspects of our business.

G1. BUSINESS CONDUCT

Transparency and Accountability

Transparency and accountability are core pillars of Star Scientific Ltd's governance framework. We have taken deliberate steps to ensure the information in our Sustainability Report is accessible, clear, and meaningful. We believe transparency means not only celebrating progress but also openly acknowledging areas where improvement is needed.

As we continue along our sustainability journey, we are committed to enhancing the depth of our reporting. This includes incorporating more detailed quantitative and qualitative data to help stakeholders track our progress effectively.

Looking ahead, we also plan to strengthen our stakeholder engagement channels to ensure our sustainability practices remain aligned with both our commitments and the expectations of those we serve.

Whistle Blower Protection

The Whistle-blower Protection Policy at Star Scientific Ltd emphasises our commitment to lawful and ethical conduct. It ensures that employees can report misconduct or unethical behaviour without fear of retaliation. This policy covers a wide range of unethical or illegal activities, including financial malpractice, fraud, non-compliance with regulatory requirements, and other offenses.

- **Anonymity and Confidentiality:** Provides options for anonymity and assures confidentiality to protect the identity of the whistle-blower.
- **Protection from Retaliation:** Explicitly prohibits retaliation against individuals who report misconduct or participate in investigations concerning improper activities.
- **Procedures for Reporting:** Outlines clear and easy-to-follow procedures for reporting, handling, and responding to complaints, ensuring swift and fair resolution.

These policies together form the basis of our commitment to upholding ethical standards in all Star Scientific Ltd activities. We continuously review and improve our policies to ensure that they are legally compliant and reflect best practices in governance and ethics.

G1. BUSINESS CONDUCT

Anti-Bribery and Corruption Policies

Star Scientific Ltd enforces strict compliance with anti-bribery and corruption laws not only within its home country but in all jurisdictions where it conducts business. Our Anti-Bribery and Corruption Policy outlines the actions and behaviours expected of employees and business partners to prevent bribery and corrupt practices.

Prohibition of Bribery: The policy explicitly prohibits bribery of any form, whether direct or indirect, involving government officials or private sector personnel.

Gifts and Hospitality: The policy regulates the giving and receiving of gifts and hospitality to ensure that they do not influence business decisions or lead to conflicts of interest.

Due Diligence: We conduct due diligence on third parties and partners to ensure compliance with this policy, particularly in jurisdictions with a high risk of corruption.

Training and Communication: Regular training sessions are provided to ensure that employees understand the policy and the importance of ethical conduct. The policy is communicated clearly throughout the organisation through multiple channels.

Reporting and Whistleblowing: Employees are encouraged to report any suspicious activity or breach of the policy through the established whistleblowing channels. Protection is provided to whistle-blowers against retaliation, in accordance with our Whistle-blower Protection Policy, to ensure that they can report misconduct without fear of reprisal.

Prevention of Fraudulent Share Trading

Star Scientific Ltd has developed a Risk Assessment to Prevent Fraudulent Share Trading Policy, drawing on the requirements of the Australian Securities and Investments Commission (ASIC), Australian Privacy Act 1988 and Australian Corporation Act 2001 (Cth). The purpose of this policy is to identify risks to corporate governance and implement measures to discourage and prevent fraudulent trading of Star Scientific Ltd's Australian shares.

This policy applies to all shareholder requests to sell or transfer shares. Each request is thoroughly vetted for potential criminal or fraudulent activity, the authenticity of supporting documentation, and confirmation that the request originates from the registered shareholder.

As a first-principles policy, Star Scientific Ltd continually monitors its obligations under Australian corporate law, particularly as governed by the Corporations Act. We maintain regular engagement with ASIC and remain committed to upholding the requirements of this policy over time.

EU TAXONOMY

As part of our commitment to sustainability and compliance with international standards, Star Scientific Ltd aims to be aligned on its operations and strategic objectives with the EU Taxonomy.

EU TAXONOMY

Compliance with EU Taxonomy

The **EU Taxonomy** is a classification system established by the EU to guide investors, companies, and policymakers in identifying environmentally sustainable economic activities.

Star Scientific Ltd is dedicated to aligning its operations with the principles and criteria outlined in the EU Taxonomy. Our flagship product, HERO®, represents a significant stride towards sustainable energy solutions, directly contributing to the objective of **climate change mitigation**. HERO® technology converts hydrogen into heat without combustion, resulting in zero greenhouse gas emissions, thus playing a pivotal role in reducing carbon footprints.

Current Activities

Star Scientific Ltd's Taxonomy Aligned Economic Activity: Close to Market RD&I

Star Scientific Ltd is primarily engaged in "Close to market RD&I", an economic activity identified as Taxonomy eligible.

This category encompasses research, applied research and experimental development of solutions, processes, technologies, business models and other products dedicated to the reduction, avoidance or removal of GHG emissions (RD&I) for which the ability to reduce, remove or avoid GHG emissions in the target economic activities has at least been demonstrated in a relevant environment, corresponding to at least TRL 6.

Contribution to Climate Change Mitigation

The EU Taxonomy specifies that activities contributing to climate change mitigation must either contribute to reducing greenhouse gas emissions or enhance carbon removal processes. HERO® technology meets these criteria by offering an alternative to fossil fuels and traditional combustion processes. Our innovation not only reduces direct emissions but also supports a broader transition to a low-carbon economy.

Specific requirements

Information about Star Scientific Ltd's compliance with the EU Taxonomy requirements specifically outlined for the "Close to market research, development, and innovation" activity is presented in the section below.

REQUIREMENTS FOR CLOSE TO MARKET RD&I

Substantial Contribution Criteria	Star Scientific Ltd Current Status
Research and Innovation Scope: The activity involves researching, developing, or providing innovation for technologies, products, or solutions dedicated to economic activities that have established technical screening criteria in the EU Taxonomy.	HERO® converts hydrogen into heat without combustion, aligning with the EU Taxonomy by providing a zero-emission alternative to conventional energy sources and contributing to climate change mitigation.
Enabling Criteria Compliance: The results of the RD&I enable one or more economic activities to meet the criteria for substantial contribution to climate change mitigation, while also ensuring no significant harm to other environmental objectives.	HERO® substantially reduces GHG emissions by eliminating combustion, aligning with climate change mitigation goals. Through tests done, Star Scientific Ltd can demonstrate that HERO® produces heat without emitting greenhouse gases. The implementation of this technology does not harm other environmental objectives, such as water and air quality.
Market-Ready Solutions: The economic activity aims at bringing to market solutions not yet commercially available, expected to outperform current technologies in terms of life-cycle GHG emissions. The implementation of these solutions results in overall net GHG emissions reductions over their life cycle.	HERO® represents a groundbreaking solution not yet commercially available, offering superior life-cycle GHG emissions performance compared to existing technologies. Its market introduction is expected to lead to significant net GHG emissions reductions. In 2024 we have commenced pilot projects with TrendPac and Mars Foods Australia.
Advancing Existing Technologies: When the researched technology or solution already meets the technical screening criteria, the focus is on developing equally low- or lower-emission alternatives with new significant advantages, such as lower cost.	HERO® ultimately enables other economic activities to substantially reduce their GHG emissions or substantially improve their technological and economic feasibility to facilitate their scaling up.
Enabling Activities: Research dedicated to enabling activities as defined in Article 10(1), point (i), of Regulation EU 2020/852 delivers innovative technologies, processes, or products that substantially reduce GHG emissions or improve the feasibility and scalability of such activities.	Our R&D efforts focus on enabling technologies that facilitate substantial GHG emissions reductions. HERO® improves the feasibility and scalability of hydrogen-based energy solutions, supporting broader adoption and impact.
Life-Cycle GHG Emissions Evaluation: For TRL 6 or 7, simplified life-cycle GHG emissions are evaluated by the entity carrying out the research. Demonstration includes either 1. A patent not older than 10 years where information on its GHG emission reduction potential has been provided 2. A permit for operating the demonstration site with provided GHG emission reduction potential.	HERO® falls under TRL 6. The technology is backed by a 2023 patent demonstrating its GHG emission reduction potential and a letter of intent from our partner, who will be part of our pilot project.

REQUIREMENTS FOR CLOSE TO MARKET RD&I

Do Not Significant Harm Criteria
Water: We assess and address any potential risks to the good status or ecological potential of bodies of water, including surface water, groundwater, and marine waters. This involves evaluating the impacts of our researched technology, products, and solutions to prevent any adverse effects on water quality and ecosystems.
Circular Economy: Star Scientific Ltd evaluates potential risks to circular economy objectives. We ensure that our technologies and products support sustainable resource use and waste reduction.
Pollution Prevention: We are vigilant in identifying and mitigating any risks of significant increases in pollutant emissions to air, water, or land resulting from our technologies and solutions. Our goal is to prevent pollution and protect environmental health.
Biodiversity: We evaluate and address any risks to the good condition or resilience of ecosystems and the conservation status of habitats and species, including those of EU interest. Our commitment includes safeguarding biodiversity and supporting the conservation of natural habitats.
Climate Adaptation: Our technologies, products, and solutions align with the criteria set forth in the EU Taxonomy, demonstrating resilience to climate impacts and fostering positive contributions to climate adaptation efforts. In our view, the formal climate assessment outlined in the EU Taxonomy may be conducted after the forthcoming upgrades to our TRL and Taxonomy Aligned Economic Activity. This timing ensures the assessment will incorporate our most up-to-date technological and operational enhancements.

Minimum Safeguards
The EU Taxonomy's minimum safeguards refer to a set of guidelines, including the UN Global Compact principles and the Organisation for Economic Co-operation and Development (OECD) guidelines, aimed at ensuring that companies operate responsibly and ethically. These safeguards cover areas such as human rights, labour rights, anti-corruption, and taxation. Star Scientific Ltd complies with these safeguards, aligning with international standards. The company adheres to human rights standards and conducts regular due diligence. It promotes fair labour practices, including non-discrimination, fair wages, and safe working conditions. Star Scientific Ltd implements a robust anti-corruption policy and conducts regular audits. Additionally, the company adheres to all relevant tax laws and is committed to transparency in tax practices. These measures ensure that Star Scientific Ltd's operations are responsible and ethical.

THE FUTURE: NEXT STEPS

Looking to the future, Star Scientific Ltd remains committed to its mission of innovation while ensuring that our operations and strategy meet the highest ESG standards. As our journey toward sustainability continues, it requires constant adaptation to new challenges and opportunities.

AFTERWORD

In this report, we have outlined Star Scientific Ltd's sustained efforts towards sustainability, drawing on the principles and structure of the European Sustainability Reporting Standards (ESRS) as a guiding framework. This approach reflects our commitment to transparency and continuous improvement as we build a robust foundation for future sustainability reporting.

Our three primary areas of ongoing focus are as follows:

1. **Rethinking Hydrogen Supply**

   At Star Scientific Ltd, we believe the orthodox thinking on hydrogen, particularly its supply and deployment is incorrect. This is evidenced by the number of cancelled and deferred projects over 2024 and 2025. The concept envisions green hydrogen being transported in bulk across intercontinental, capital-intensive supply chains, adds significant cost to an already expensive molecule and is increasingly encountering resistance in the market.

   In contrast, Star Scientific Ltd advocates for a model. where green hydrogen supply is light, nimble and local. This means it should be produced on or near its terminal use, stored in "just in time" quantities and used efficiently, via the HERO® catalyst.

   To support this vision, we will complete the design of mass-producible HERO® systems and pursue certification from relevant government authorities through 2025 and 2026. We will also identify production and deployment sites in Australia, the US, and Europe to enable customer delivery at scale.

2. **New implementations**

   Star Scientific Ltd employs visionary scientific thinkers committed to our core value of being "constantly curious". However, we recognise that there are many like-minded thinkers in other institutions.

   To that end, we maintain continuous relationships with academic institutions, particularly where they have expertise in complementary systems that are related to, but outside our core technologies and competencies.
   We had several lines of inquiry in place over this period, and we hope to report on the fruits of these deliberations in future reports.

AFTERWORD (cont.)

3. Regulatory concerns

Establishing a regulatory operating environment for HERO® has been a challenge, but an exciting one. HERO® is new to science and overturns the orthodox thinking that hydrogen needs to be burned to release its energy. Regulators therefore have no reference for it - it does not fit into their "rule books".

While progress is slow and, at times, frustrating, we have universally found that regulators have embraced the challenge and joined us on what, for all of us, has been a process of discovery.

We foresee that the same will occur with the ESG regulatory environment, as regulators come to understand the impact of HERO® on supply chains and communities, particularly in the developing world.

Our commitment to transparency and accountability remains steadfast. As we progress, we will continue to strengthen our sustainability practices, measure our impact with greater precision and communicate our progress openly. We invite our stakeholders to be part of this journey as we work together to create a more sustainable, resilient and inclusive future.

COOPERATION PARTNER

This Sustainability Report was written with the guidance of our partner – **Aspect Advisory GmbH**. Please find below their disclaimer.

Aspect Advisory GmbH Disclaimer:
Aspect Advisory is proud to have supported Star Scientific Ltd in the preparation of the 2024 Sustainability Report as part of its broader sustainability journey.

We provided guidance across key areas of sustainability reporting, with a particular focus on alignment with the ESRS.

It is important to note that the materials and data presented in this Sustainability Report were provided by Star Scientific Ltd and have not been independently verified by Aspect Advisory.

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