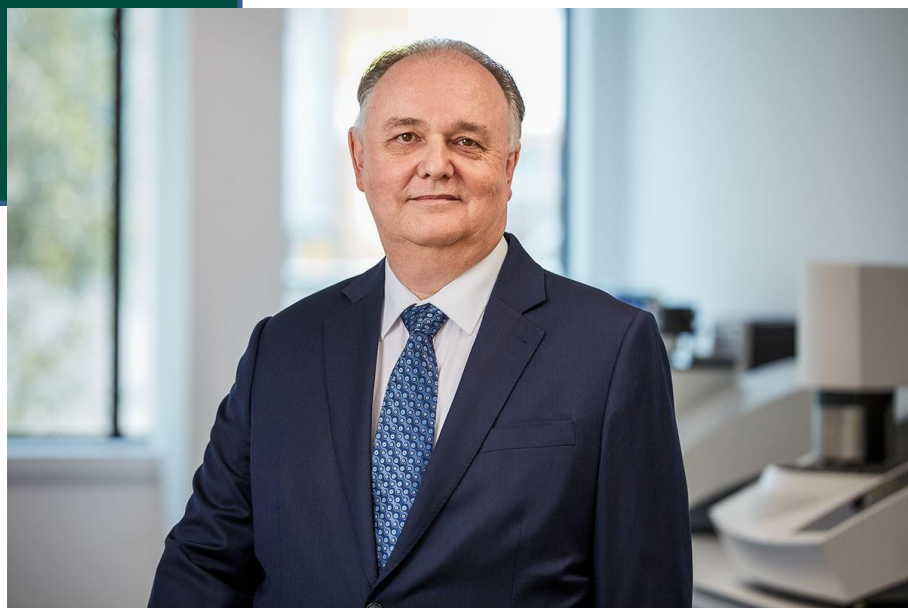




STAR SCIENTIFIC

2023 Sustainability Report

Message From Leadership



Andrew Horvath

Global Group Chair

It has been approximately six years since Star Scientific Limited unveiled to the world our profound discovery, the Hydrogen Energy Release Optimiser, or HERO®.

HERO® is a catalyst that chemically binds oxygen and hydrogen to form pure water, and in doing so, releases high quantities of heat, without generating greenhouse gases. HERO® is a “true” catalyst, meaning that it does not give itself to the process and therefore does not wear out.

The following years, until now, have seen us on a journey of discovery of HERO®’s commercial applications across the globe, and a long and continuing process of gaining the understanding of regulators and therefore appropriate licences to operate.

One of the key “licences” we require is a transparent, publicly available Sustainability report. We have commenced this process by commissioning an inaugural audit and outlining our “starting point” in this preparatory report. Star Scientific Limited is confident that we will have a profoundly positive impact on global sustainability, as we assist our partners and customers to decarbonise their operations and assist individuals and communities on their sustainable growth path.

However, we also understand the need to constantly work on the application of ESG principles in our own operations. (contd.)

Message From Leadership (contd.)



As we commence this journey, we will be guided by 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.



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.

On this last point, curiosity is critical to us. At Star Scientific Limited we will constantly challenge the orthodox thinking about energy and hydrogen's role. HERO® is just the start of our offering to the world's energy transition. We look forward to bringing forward other exciting technological innovations in the years to come.

Sincerely,

Andrew Horvath

Global Group Chair

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Foreword

Welcome to Star Scientific Limited's inaugural Sustainability Report!

We hope you find the content interesting and engaging. To be accurate, it is less an "inaugural" report and more accurately a "beta" report, as it sets the baseline, the framework by which we will be reporting in the coming years. Many of the questions posed in a standard sustainability report cannot yet be answered here. However, the brevity in our answers needs to be taken in context.

Firstly, Star Scientific Limited is at the start of its sustainability journey, and it is a journey from a Research and Development facility with a negligible carbon footprint to a mass manufacturing company with global operations.

Most of these reports are developed for long-standing companies, many of multi-national scope, whose activities have made a notable contribution to the global carbon load throughout the Industrial Revolution. To maintain social licence and investor and customer support, they need to retrofit their practices and products to reduce and hopefully, in time, remove their carbon outputs, while at the same time conforming to other globally recognised human equity standards.

Happily, this is not the case for Star Scientific Limited, as we are at the start of our journey. Relative to these older industrial titans, we are a "blank page". We will be able to commence our scale-up without the burden of legacy systems and practices, and this report marks the start of that journey.

The second important piece of context is that no matter how big we grow, any negative environmental impact we may be responsible for will be tiny, relative to our beneficial impacts. Through the application of science and our expertise in hydrogen, we aim, boldly, to decarbonise the industrial world. Indeed, we hope to be the solution for the legacy industrial companies referred to above.

(contd.)



Matthew Hingerty

Deputy Chair, Deputy CEO and Head of Business Development

Foreword (contd.)



But our mission is not just decarbonisation – indeed it is not our foremost aim. We are driven by a desire for “energy justice” for those human beings whose lives are held back for want of clean, reliable energy. We can think of no better corporate aim than to provide human beings with the level playing field they need to be their best selves.

Although we believe our net impact on the planet will be overwhelmingly positive, we understand the importance of ESG practices in our daily operations and transparent annual reporting. We understand our stakeholders, including our staff and potential staff, our investors, our customers, our neighbouring communities, our regulators, and governments, will want us to implement the highest standards we expect from others in our supply chain.

We therefore commence this journey on ESG reporting with a deep seriousness, but also a sense of excitement, for we know we can be “standard setters” and not just “standard takers”.

We invite you to follow our journey, starting with this small, modest step, and we look forward to your support, encouragement, and feedback along the way.

A handwritten signature in black ink, appearing to read "Matthew".

Matthew Hingerty

Deputy Chair, Deputy CEO and Head of Business Development

For People and Planet

A chance to champion Energy Justice – the time is now

An important component of the clean energy transition is energy justice, which encompasses different aspects of fairness and equity in the energy sector. Energy justice recognises the need of several dimensions from distributional justice that focuses on the equitable allocation of energy benefits and burdens, such as access, affordability, and health impacts. Procedural justice ensures transparent, fair decision-making processes with public participation and access to information. Recognition justice values diverse perspectives, especially those of marginalised communities and Indigenous peoples.

Simply put, it aims to apply social justice principles and concepts to the global energy system in its entirety, ensuring the energy transition is carried out in a way that there is no negative disruptive to cultures and customs.

At Star Scientific we embrace this, as we strongly believe that the energy transition presents an opportunity to advance energy justice. What does this mean?

- The energy transition can spark significant change, addressing more than just our energy issues.
- HERO® can remove technological obstacles facing underprivileged communities, by sustainably providing life's essentials such as clean energy, water and heating.
- Decentralized systems and circular economies can empower local growth through ownership and job creation, particularly in regions with abundant resources and the capacity to generate renewable energy.
- Innovation can thrive with the right support and infrastructure for education that can sustain the clean energy economy once implemented.

These outcomes, however, cannot be owned by one person, or one company alone. Star Scientific commits to partnering with like-minded organisations all over the world to gain the understanding needed to create, and disseminate, the building blocks for achieving our joint sustainability goals.

Nothing is more important to Star Scientific than the positive impact we will have on the lives and communities that are still at a disadvantage today. I look forward to contributing to our future Sustainability Reports on our continuous efforts in achieving a Just Energy Transition for all.



Amy Halliday, MBA
Energy Justice Officer
DBA candidate, Energy Justice

About this Report

Our Sustainability Report consists of two main parts:

Since this is our first Sustainability report, **the first part** will introduce you to Star Scientific Limited and the heat-generating HERO® (Hydrogen Energy Release Optimiser) technology. You will learn about our history, 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 part** will cover the main topics of Sustainability in line with the European Sustainability Reporting Standards (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 Corporate Sustainable Reporting Directive (CSRD).

At the end of our Sustainability Report, an **additional section** will address the EU Taxonomy and our compliance status with its requirements.

It is important to note our bold decision to be among the first in the world to publish a Sustainability Report in line with the ESRS, based on two main ideas :

- ✓ Firstly, the ESRS itself are among the most comprehensive sustainability reporting standards worldwide;
- ✓ Secondly, this decision reflects our unwavering confidence in our significant growth in the coming years, particularly within the EU, necessitating compliance with EU sustainability regulations.



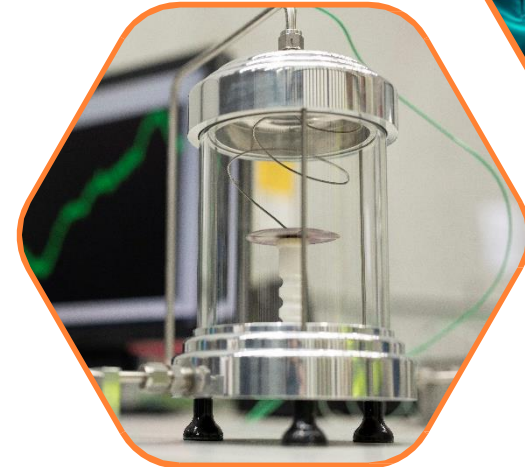
COMPANY OVERVIEW

Star Scientific Limited is a hydrogen research and development company dedicated to creating safe, reliable, affordable energy with zero emissions.

At the heart of our quest for sustainable energy solutions lies the Hydrogen Energy Release Optimizer, known as HERO®.

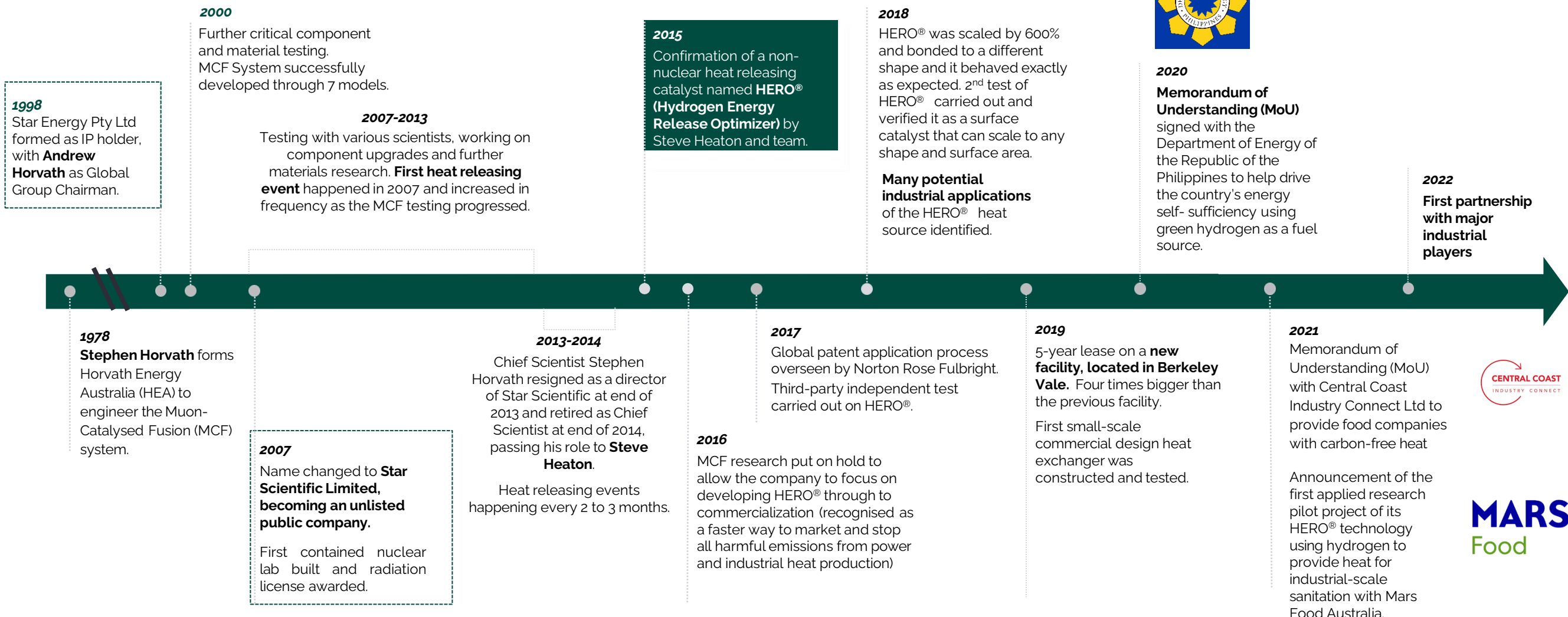
Company History

Founded 25 years ago by Andrew Horvath, who now serves as our Global Group Chair, Star Scientific began its journey with a focus on advancing muon-catalysed fusion technology. This initial research laid the groundwork for what would become a culture of innovation and resilience. A pivotal moment in our history was the breakthrough discovery that led to the development of the HERO® – Hydrogen Energy Release Optimiser. This technology epitomizes our approach to innovation, harnessing the power of hydrogen to create energy solutions that are not only sustainable but are also completely emission-free.



Company History

As a consequence of nuclear fusion materials research, Star Scientific's team harnessed and transformed heat-releasing events into the heat-generating technology of HERO®



Company History

As a consequence of nuclear fusion materials research, Star Scientific's team harnessed and transformed heat-releasing events into the heat-generating technology of HERO®



October 2023

Star Scientific Limited and the Government of the State of New Mexico announced that Star Scientific had chosen Albuquerque, New Mexico as its preferred location for its first operation in the United States.

The 1st of Jan 2024
Date of the current Sustainability Report



April 2024

Star Scientific was honoured to be visited by Kadri Simson, the European Union's Energy Commissioner.

October 2023

Star Scientific Limited announced that it was developing a second pilot project for Central Coast packaging company Trendpac.



April 2024

Star Scientific Limited's New Mexico project was one of fifteen projects across the United States to receive the Trade and Industry Development Magazine's "Community Impact Award."



May 2024

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



Our Mission

At Star Scientific, we are driven by a singular mission: to pioneer safe, cost-effective, and zero-emission energy solutions that meet today's needs without compromising the future. We offer a unique way to deliver safe, affordable energy with zero emissions. Backed by philanthropists and scientists who share our passion for solving this problem, we've invested \$100 million in Australian research and development (R&D) to deliver on this ambitious but achievable goal and we will be investing much more in the future.



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

Our international offices are not just strategic points of contact but are centres of a community of innovation and collaboration. Each location is integral to our research and development efforts, ensuring that our solutions and practices can be adapted to different energy markets and environmental challenges around the world.



Our Partners

We partner with industry and government to 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 Commitment to Sustainability

Each step in our operational and strategic activities is aligned with our core values of innovation, safety, and environmental stewardship. From our research labs to our global offices, our team is united in its effort to contribute to a sustainable energy economy. We believe that our work not only leads to technological advancements but also fosters a broader transition towards sustainable practices worldwide.

Our Leadership Team

At the helm of Star Scientific, 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 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, 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 heart of our quest for sustainable energy solutions lies the Hydrogen Energy Release Optimizer, known as HERO®.

This pioneering technology stands out for its ability to convert hydrogen into heat without combustion, using a proprietary catalyst to initiate a reaction between hydrogen and oxygen.

The process is remarkably efficient, rapidly achieving temperatures exceeding 700 °C within minutes.

Notably, HERO® generates heat on an industrial scale while ensuring the process is flameless and safe, making it an ideal solution for diverse commercial applications.



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



HERO® operates on a simple yet powerful principle: the larger the surface area of the catalyst and the greater the availability of hydrogen, the more heat is produced. This technology not only promises high efficiency but also environmental sustainability, as its only by-product is pure water. This characteristic positions HERO® as a uniquely clean and sustainable heat source, suitable for a wide range of industrial applications.



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.

The cost to produce steam using HERO® is around the same as with coal, with significant cost savings achievable due to a reduction in coal handling and pollution control. This has the potential to save power providers between \$100 million to \$250 million per year.

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 PROCESSES

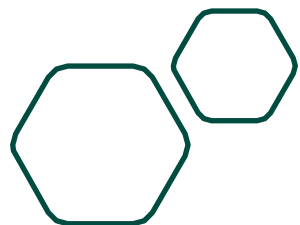
Heat production can be one of the most energy intensive parts of the production process for many industries.

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's flagship technology is based on a high yield heat-releasing catalytic reaction that occurs when oxygen and hydrogen meet an innovative catalyst: the Hydrogen Energy Release Optimiser (HERO[®]).

What is HERO[®]?

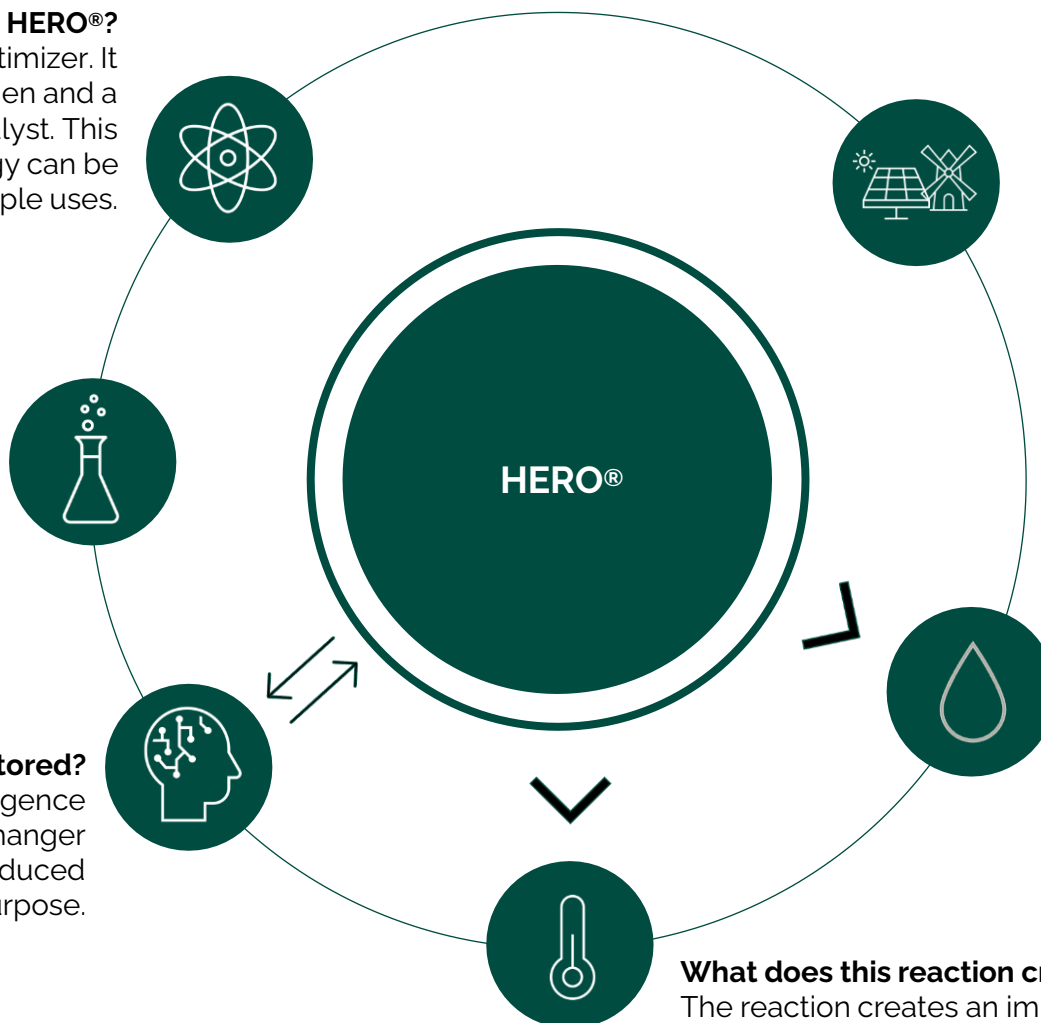
HERO[®] stands for Hydrogen Energy Release Optimizer. It is a catalytic reaction between Oxygen, Hydrogen and a confidentially kept proprietary catalyst. This revolutionary heat-generating technology can be transformed into reliable energy for multiple uses.

What happens to the catalyst during the reaction?

The 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 electrolyzers, 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.

To begin with we plan on using highly efficient internally produced electrolyzers to produce Green hydrogen for use in HERO[®] installations.

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.

WHY HERO®?



HERO

○ AFFORDABLE, INDUSTRIAL-SCALE POWER

HERO® can ensure the ongoing life of the industrial infrastructure associated with electricity generation with zero emissions. By swapping HERO® for a coal-fired boiler in an existing power plant, carbon emissions can be cut to zero while the plant can continue to operate. Costs can be reduced by eliminating the need for infrastructure replacement and multi-million-dollar pollution control measures. This has the potential to save power providers between \$100 million to \$250 million per year.

○ INFINITELY SCALABLE AND DOES NOT RELY ON POWER GRID

Star Scientific's HERO® is deployable for decentralised small-scale power solutions in remote locations or for large scale legacy power generation and industrial heat production. 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. The technology can be used from the heaviest of industries such as replacing coal-fired power stations, to scaled-down local assets for specific locations such as district heating and desalination.

○ ACTIVATOR FOR GREEN HYDROGEN ECONOMY

HERO® produces unlimited, affordable, safe and reliable industrial-scale heat from hydrogen – with zero emissions. While technologies such as solar and wind have an essential role in our transition from fossil fuels, they are not adequate for the needs of large-scale industrial applications such as electricity generation, industrial processes, district heating, and desalination. The reason HERO® is so special is that for the first time, we have a non-polluting industrial catalyst that can generate the entire commodifiable range of heat necessary for all of these major industrial applications. This is where HERO® will emerge as the final link in the hydrogen chain.

○ THE POWER OF HYDROGEN WITH NO EMISSIONS

Hydrogen is the most abundant chemical element in the universe, with the highest energy density by weight. **Hydrogen Energy Release Optimiser (HERO®)** is one of few technologies that can put hydrogen into use today – without generating greenhouse gas emissions. Behind HERO®'s powerful heat source is the interaction of hydrogen and oxygen with a secret catalyst. Within minutes of the hydrogen interacting with the catalyst, HERO® safely reaches temperatures of more than 700 degrees Celsius. The larger the surface area of the catalyst and the more hydrogen available, the more heat is generated. The only by-product is pure water.

AWARDS AND RECOGNITION

Star Scientific'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 recognizes Star Scientific'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.



SXSW Innovation Awards
New Economy Technology 2022

Recognized at the South by Southwest (SXSW) conference, this award celebrates Star Scientific'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.



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.



FRAMEWORK

Star Scientific commits to transparency and accountability in our sustainability efforts. To align with these principles and ensure robust disclosure of our environmental, social, and governance (ESG) practices, this sustainability report has been prepared in accordance with the European Sustainability Reporting Standards (ESRS)

European Sustainability Reporting Standards (ESRS)

Star Scientific has adopted the European Sustainability Reporting Standards (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 European Union regulations** on sustainability reporting. As Star Scientific 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 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.

Using an established and respected reporting framework like ESRS builds confidence and trust among our stakeholders. It assures them that our reporting is up to international standards and that the disclosed information is reliable and verified. This trust is essential for maintaining strong relationships with stakeholders, including investors, customers, employees, and regulatory bodies.

For our management team, the ESRS framework provides clear guidelines and metrics for assessing and reporting sustainability performance. This structured approach aids in identifying areas where we excel and those requiring improvement. It supports strategic decision-making by highlighting trends and impacts that are critical for long-term sustainability planning.

Using ESRS enhances the consistency and comparability of our sustainability reporting. This allows stakeholders, including investors, customers, and regulatory bodies, to effectively assess and compare our sustainability performance with other organisations, facilitating better decision-making based on standardised information.

Adopting ESRS reflects our commitment to sustainability best practices and continuous improvement.

It provides a structured approach to measure, manage, and communicate our efforts, driving us towards greater efficiency and impact in our sustainability initiatives.



Finally, the ESRS framework aligns with our commitment to future sustainability. It encourages us to look forward, anticipate changes in regulations, and adapt to emerging sustainability trends. This proactive approach not only helps in managing risks but also in seizing opportunities related to sustainable development.

The ESRS are designed to complement and align with established international sustainability frameworks such as the Global Reporting Initiative (GRI). This alignment ensures that our sustainability reporting not only meets stringent European regulatory requirements but also adheres to globally recognised best practices. By integrating ESRS with GRI, Star Scientific provides a comprehensive and consistent reporting framework that enhances transparency, comparability, and credibility, ensuring our disclosures meet the expectations of a broad range of global stakeholders.

By integrating the ESRS framework into our sustainability reporting, Star Scientific reaffirms our dedication to high standards of transparency and accountability. This approach not only helps us meet our legal obligations but also supports our mission to operate responsibly and sustainably, enhancing our contribution to a more sustainable future.

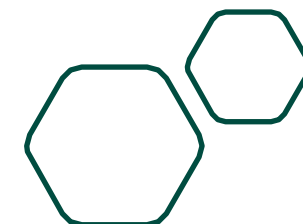


We look forward to regularly publishing our Sustainability Reports in accordance with the ESRS and expanding the range of topics and issues covered.

The table below presents the relevance of various ESRS topics for our company. Currently, as we are at 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 business activities might generate now and in the future. As we progress towards the commercialization stage (TRL 9), our reports will incorporate a double materiality analysis to further refine our sustainability focus.

Group of Standards	Subject	Relevance for the 2023 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 will be an international operational company, with multiple projects across various countries and regions.





ENVIRONMENT

At Star Scientific, our journey towards **environmental excellence** is not just about mitigating risks; it's about embracing our responsibility to the planet and pioneering a future where energy production harmonises with the world around us. As a leader in hydrogen technology research and development, we recognise the pivotal role we play in transitioning to a sustainable energy economy. Our foundational technology, HERO®, stands at the forefront of this transition, offering a ground-breaking approach to generating heat without combustion, thereby eliminating emissions at the source.



Our dedication to environmental sustainability is driven by a deep-seated belief that businesses have a crucial role in combating climate change and preserving natural resources for future generations.

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

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



This section of our sustainability report outlines our environmental management strategy, areas of focus, achievements, and goals. It reflects our ongoing efforts to integrate environmental considerations into every aspect of our business, from the ground up. By transparently sharing our journey, we aim to inspire action, foster collaboration, and contribute to a more sustainable world.

Our Environmental Commitment

At Star Scientific, our commitment to the environment extends beyond the innovative applications of HERO®. It permeates every facet of our operations, from the communities where our products are utilised to the places where they are crafted. We believe that true sustainability begins at the source — with the design and production of our technologies.



E1. CLIMATE CHANGE

At Star Scientific, we recognise the significant impact that climate change has on our planet and humanity. Committed to our mission of pioneering zero-emission energy solutions, we actively contribute to global efforts aimed at mitigating climate change through innovative technologies and sustainable practices.

E1. Climate Change

GREENHOUSE GAS EMISSIONS



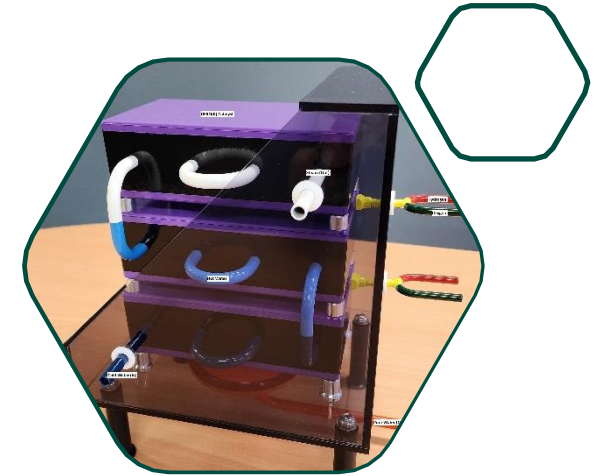
SCOPE 1

(direct emissions from owned or controlled sources)

HERO® is a cornerstone of Star Scientific's efforts to mitigate climate change. With no greenhouse gas emissions, HERO® significantly reduces environmental impact compared to traditional energy sources. The technology utilises a proprietary catalyst to convert hydrogen into heat without combustion, ensuring minimal environmental footprint.

Currently, as we are in the research and development phase, comprehensive data on all Scope 1 emissions from our operations are not yet available. However, initial assessments indicate that, even when upscaled, the positive environmental impact of HERO® will far surpass the emissions involved in its production and deployment.

Star Scientific continues to advance clean energy solutions, with HERO® representing a significant step towards a sustainable and climate-resilient future.



E1. Climate Change



GREENHOUSE GAS EMISSIONS



SCOPE 2

(indirect emissions from the generation of purchased energy)

We are committed to minimising its carbon footprint by carefully monitoring and managing energy consumption. Scope 2 emissions, which result from the consumption of purchased electricity, are a significant area of focus in our sustainability efforts.

Berkeley Vale

Electricity Benchmarking	MWh	CO2(e) t
1 st Quarter 2023	48.2	38.0
2 nd Quarter 2023	44.9	39.6
3 rd Quarter 2023	49.2	34.1
4 th Quarter 2023	36.5	26.6

Current Energy Consumption in 2024

100% Green Energy Usage: As of 1st March 2024, Star Scientific 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 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

GREENHOUSE GAS EMISSIONS

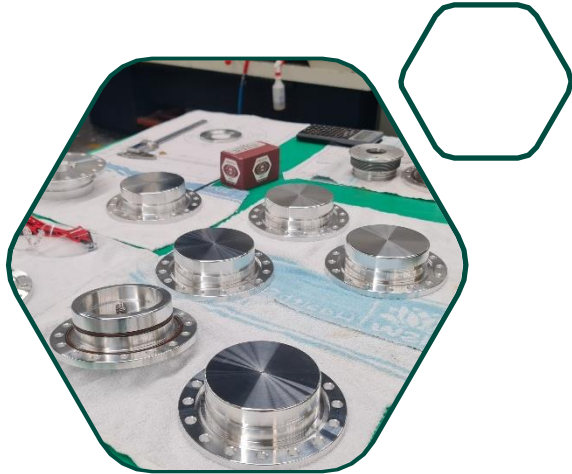


SCOPE 3

(all other indirect emissions that occur in our value chain)

Overview: Scope 3 emissions encompass a wide range of indirect emissions that occur in Star Scientific'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.

While the quantification of Scope 3 emissions presents challenges, Star Scientific is proactively addressing these issues as part of our broader environmental stewardship. By building a comprehensive understanding of our indirect emissions, we aim to make informed decisions that support our commitment to a sustainable future.



Future Plans: Star Scientific 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, 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 Research, Development & Innovation stage. To demonstrate the potential impact on reducing emissions, we are pleased to share data from our pilot project, which will commence in 2024. 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 for the trial project.**
- 2. Justifying the non-occurrence of the carbon emissions during the HERO® heating process.**
- 3. Calculating how much of carbon intensity of the client will be reduced by using the HERO® technology.**

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.



E1. Climate Change

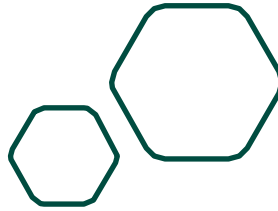


STEP 1. UNDERSTANDING THE TOTAL CARBON FOOTPRINT OF THE MATERIALS USED

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 CO₂(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	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/>

E1. Climate Change



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, detailing the results of these demonstrations. The results show that no common greenhouse gasses were either being input into the system, nor emitted from the system. **Greenhouse gases such as carbon dioxide (CO₂), carbon monoxide (CO), methane (CH₄), and nitrous oxide (N₂O) were not present anywhere within the system.** The only other gases present were hydrogen (H₂) and oxygen (O₂), 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 CO₂(e) per year to 2,396.5 tonnes of CO₂(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 CO₂(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, we are deeply dedicated to minimising our environmental impact, with particular emphasis on managing and reducing pollution across all facets of our operations. This commitment is reflected in our rigorous pollution control practices, compliance with environmental standards, and proactive engagement 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

More 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.



E2. Pollution



Future Considerations

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



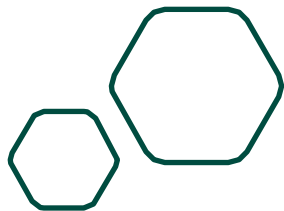
Research and Development: Our ongoing R&D efforts focus on developing more efficient and less pollutive technologies, especially in the area of hydrogen energy conversion, which inherently offers a cleaner alternative to traditional energy sources.

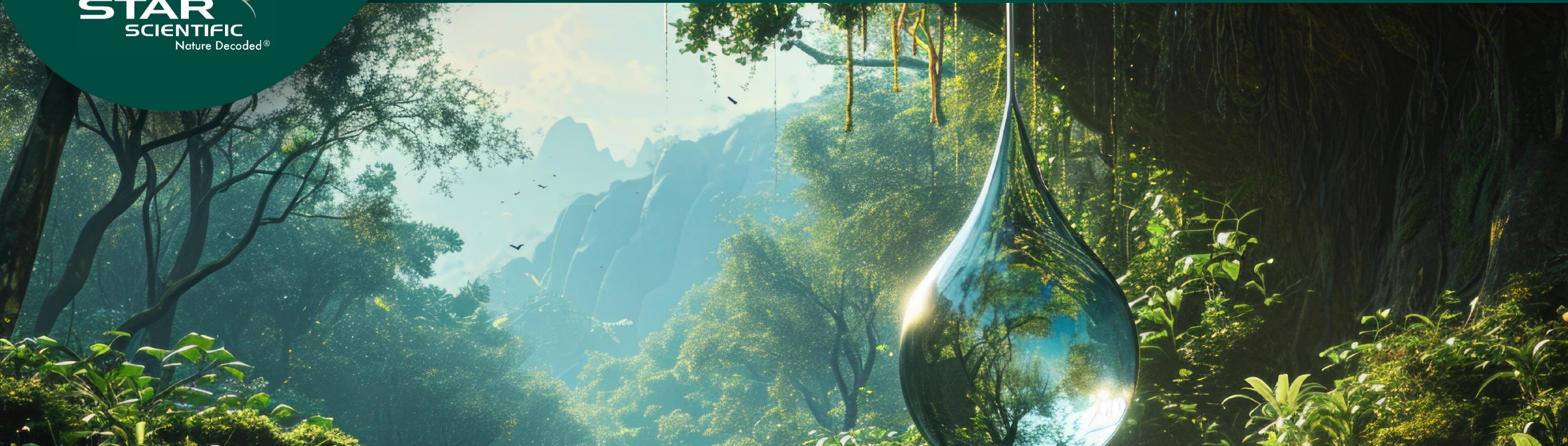


Sustainability Planning: As part of our commitment to future sustainability, we plan to integrate more robust pollution control technologies and practices as we expand our operations internationally by 2028.

Impact and Sustainability Goals

Star Scientific'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, aligning with global efforts to combat environmental degradation and promote a sustainable future.





E3. WATER AND MARINE RESOURCES

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.

E3. Water and marine resources

Operational Efficiency

We work closely with property management to promote water-saving measures and ensure that our operations use water as efficiently as possible. Promoting water conservation awareness among employees through training and engagement programs to encourage mindful water use.

Future Considerations

As Star Scientific plans for future growth and the potential acquisition of owned facilities, we commit to integrating advanced water management systems, including rainwater capture and on-site treatment, to further minimise our environmental footprint and enhance resilience in water management.

By focusing on these practices and working within our current leasing arrangements, Star Scientific commits to responsible water management that supports our sustainability goals and ensures efficient and effective use of water resources.

Water Consumption

Date	Usage (kl)
1 st Quarter 2023	21
2 nd Quarter 2023	122
3 rd Quarter 2023	561
4 th Quarter 2023	32
Total 2023	736
<i>For the reference:</i>	
1 st Quarter 2024	12
2 nd Quarter 2024	32





E4. BIODIVERSITY AND ECOSYSTEMS

As part of Star Scientific'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 play in maintaining biodiversity and supporting life.

E4. Biodiversity and Ecosystems



Biodiversity and Ecosystem Conservation

As Star Scientific continues to grow and expand its operations, the construction of developments, including buildings and other infrastructure, will be an integral part of our development strategy. Recognising the potential impact these activities could have on local ecosystems and biodiversity, we commit to not only complying with all regulatory standards but also striving to create 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, we are focused on sustainable resource use and advancing towards a circular economy. Currently, Star Scientific leases its property and relies on the Central Coast Council for water supply and wastewater management. Although our current location limits detailed specifics on water usage beyond those already disclosed, our future plans reflect a proactive approach towards sustainable water management.

E5. Resource use and Circular economy



Our upcoming purpose-built facility is designed with sustainability at its core.

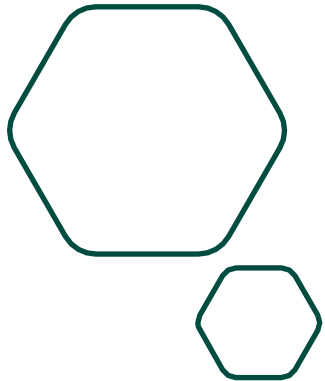
Water Resource Management

Our upcoming purpose-built facility is designed with sustainability at its core. A significant aspect of this design is the integration of rainwater capture systems for human use, alongside on-site water treatment and reticulation systems for industrial purposes. This approach will ensure that our dependency on imported (purchased) water is minimised, aiming for negligible, if not zero, usage. By capturing and treating water on-site, we not only reduce our environmental footprint but also enhance our resilience and self-sufficiency in water management.

Waste Management and Circular Economy Initiatives

As we transition to owning our property, significant improvements in waste management will be implemented. Our strategy includes setting precise reduction targets for waste production and designing facilities that support these goals. An essential enhancement in our new facility will be the improved means for monitoring waste production. This will allow for more accurate tracking, better management practices, and continuous improvements in waste reduction.

By focusing on these key areas – sustainable water use and advanced waste management – we are actively contributing to a circular economy. Our commitment to these principles ensures that we not only meet regulatory requirements but also lead by example in the energy industry. Star Scientific's dedication to sustainability is reflected in our forward-thinking plans and continuous efforts to minimise our environmental impact.



E5. Resource use and Circular economy



Waste Management

At Star Scientific, we commit to implementing robust and responsible waste management practices that align with our mission to deliver sustainable and zero-emission energy solutions. Our approach to managing waste is comprehensive and is guided by the principles of reducing environmental impact, maximizing 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 fraction that exceeds local disposal limits, or poses significant hazards, is managed with greater scrutiny. We partner with certified commercial chemical waste disposal companies to handle these materials. These companies are equipped to process and dispose of hazardous substances in a manner that adheres to strict environmental and safety standards, ensuring that our waste does not adversely impact the environment.



Chemical Waste Management

We proactively reduce the reactivity and volatility of our chemical waste by neutralising acids and bases. This process involves adjusting the pH of these substances to a neutral level, minimising their corrosiveness and potential hazards. Once neutralised, the waste is assessed to ensure it meets local disposal regulations before it is safely released into the sewerage system. This careful handling mitigates the risks associated with chemical waste and supports safe environmental practices.



Extraction of Dissolved Metals

In addition to treating standard chemical waste, we have implemented an extraction process to remove dissolved metals from our waste streams. This not only addresses potential environmental contaminants but also recovers metals that can be reused or sold. Although our extraction method does not completely eliminate dissolved metals, it significantly reduces their concentration, capturing a substantial percentage. This approach reflects our commitment to resource efficiency and our proactive stance on minimising our environmental footprint.

E5. Resource use and Circular economy



Solid Waste Management

Safe Disposal Practices

Continuous Improvement and Innovation

We prioritise reducing the generation of solid waste at the source and actively seek opportunities to recycle materials wherever possible. This includes reusing materials within our operations and partnering with recycling facilities to divert waste from landfills.

For solid waste that cannot be recycled or reused, we ensure that disposal methods comply with environmental regulations. We work with licensed waste disposal services to handle the safe and compliant removal of non-recyclable solid waste, ensuring minimal environmental impact.

We continuously evaluate and enhance our waste management practices through regular audits and assessments. Our aim is to identify new technologies and methods that can further reduce waste generation and improve waste treatment and disposal processes. We also commit to transparently reporting our waste management performance and improvements as part of our broader sustainability goals.



SOCIAL

At Star Scientific, we believe that our responsibility extends **beyond pioneering sustainable energy solutions** — it encompasses a commitment to positively impacting the communities we serve and the environments in which we operate. Social responsibility is integral to our mission, guiding our interactions with employees, partners, customers, and communities.



Our dedication to social sustainability is driven by a deep understanding that true innovation flourishes in a culture that values human dignity, diversity, fairness, and mutual respect.

In this section, we outline our comprehensive approach to fostering a safe, inclusive, and empowering workplace, supporting the communities around us, and ensuring that our business practices promote social equity and respect human rights.

As we navigate the complexities of the global landscape, we remain focused on enhancing our social initiatives and strengthening our relationships with all stakeholders. Through **transparent reporting, continuous improvement, and active engagement**, we aim to not only meet but exceed the expectations placed upon us as an emerging leader in the sustainable energy sector.

In the following pages, we detail our strategies, achievements, and future goals in areas such as employee welfare, consumer protection, community engagement, and ethical governance. Each element of our social responsibility framework is designed to contribute to a sustainable and equitable future, ensuring that as our company grows, so too does our positive impact on society.





S1. OWN WORKFORCE

At Star Scientific, we recognise that our employees are our most valuable asset. This section focuses on our own workforce, detailing our efforts to support, develop, and empower every member of our team. Our goal is to create a work environment that not only fosters innovation and productivity but also upholds the highest standards of ethical conduct and respect for individual rights. We aim to ensure that Star Scientific is not just a place to work, but a place where careers flourish and personal growth is encouraged.

S1. Own Workforce



Star Scientific commits to consulting on Workplace Health and Safety matters with all employees, visitors and any other personnel who may be affected by the inputs, processes and outputs arising from Star Scientific's operations.

Health and Safety

Leveraging detailed Job Safety Analysis and Risk Assessments, we ensure that all workplace activities are thoroughly evaluated for risks, and appropriate controls are implemented to safeguard our employees. These assessments are reviewed biannually or upon any significant change in the workplace, ensuring ongoing relevance and effectiveness.

Our workplace Health and Safety Policy encourages active participation and communication between all levels of staff regarding workplace safety matters. This policy facilitates an environment where safety concerns are freely shared and addressed through structured consultation processes, promoting a culture of safety and compliance.

Work-life balance

We believe that a healthy work-life balance can maintain the physical, emotional and mental health of our employees. To ensure this, we have introduced a 4-day workweek and 5 weeks of holidays.

Training and Development

We provide comprehensive training programs that include safety training, leadership development, and skills enhancement to ensure our employees are well-equipped 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 development and continuous learning.



Diversity and Inclusion

Since our founding, we have endeavored to foster a workplace that values each person and promotes diversity of thought, positive engagement, and productivity. We are committed to treating all employees fairly, with respect, and without bias. Employment decisions are based solely on merit, and we strive to maintain a work environment that fosters good working relationships and respects diverse backgrounds and perspectives.

Within the organisation, we seek to reflect the world we serve, and we welcome people from all walks of life, backgrounds and life experiences. This rich and diverse culture makes us stronger and is a source of motivation, performance and innovation.

Employee Demographics

Gender	No.
Female	7
Male	12
Total	19

Office	No.
Gordon	6
Berkeley Vale	13
Total	19



S2. WORKERS IN THE VALUE CHAIN

We recognise the importance of maintaining high standards and ethical practices throughout our supply chain, even as our direct interaction with workers in the value chain is currently limited. This section outlines our commitment to responsible sourcing and supplier engagement. As we grow, we are dedicated to increasing our oversight and improving the welfare of all workers involved in our operations.

S2. Workers in the Value Chain

Current situation

At Star Scientific, we recognise the importance of maintaining high standards and ethical practices throughout our supply chain. To this end, we have established a comprehensive supply chain policy that outlines our commitment to responsible sourcing and supplier engagement.

Our supply chain policy ensures that our suppliers adhere to the same standards of quality, safety, and ethical conduct that we uphold within our own operations. This policy covers various aspects, including labour practices, environmental sustainability, and compliance with legal and regulatory requirements.

As Star Scientific continues to grow, we commit to placing greater emphasis on the workers within the value chain.

This will involve enhancing our oversight and engagement with suppliers to ensure that they meet our stringent standards. We understand that a responsible and ethical supply chain is crucial for sustainable business growth and 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 adopting these measures, Star Scientific aims to strengthen our supply chain management and ensure that our values of integrity, quality, and sustainability are reflected throughout our entire value chain. This proactive approach will not only enhance our operational resilience but also contribute to the overall well-being of workers who play a crucial role in delivering our innovative solutions to the market.



S3. AFFECTED COMMUNITIES

At Star Scientific, we deeply value our relationship 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 engaged community member. We understand that our presence and activities have the potential to impact these communities, and we strive to foster positive, long-lasting relationships built on trust, transparency, and mutual respect.

S3. Affected Communities

Community Engagement and Involvement

We are proud members of several local business associations in the Central Coast region. These memberships enable us to maintain a strong presence and active involvement in the community. Through these associations, we participate in local events, support community initiatives, and engage with various stakeholders, including regulators, business leaders, and community members.

Ongoing Communication

Maintaining open lines of communication with the community is crucial. We rely on both formal and informal feedback mechanisms to understand our impact and standing within the local area. This includes regular interactions with local business associations, community leaders, and residents. We encourage feedback through the contact information available on our website, which allows stakeholders to reach out directly with their comments and suggestions. The feedback we receive is invaluable in helping us gauge how we are perceived and where we can improve. Whether it's concerns about environmental impacts, suggestions for community projects, or insights into local needs, we take this feedback seriously and respond with appropriate actions. Our goal is to be proactive in addressing community concerns and to adapt our strategies to align with local expectations.

Current Impact

To date, our environmental impact on the local community has been minimal. This has been corroborated by feedback from our community interactions and the lack of formal complaints or concerns raised about our operations at Berkeley Vale. Given this negligible impact, we have not established formal environmental monitoring systems specifically for community impacts.

Future Monitoring Systems

As we look to scale up our operations and embark on the construction of new facilities, we recognize the need to implement more structured monitoring systems. These systems will be developed in consultation with our ESG external advisor and internal ESG staff. They will be designed to proactively identify and mitigate any potential impacts on the local community, ensuring that we continue to be a responsible corporate citizen as we grow. Our approach to community impact and monitoring will be guided by best practices in ESG management. This includes adopting comprehensive environmental and social management systems that are tailored to the specific needs of the communities in which we operate. We will also seek to continue to align with local regulations and international standards to ensure that our practices are robust and effective.





S4. CONSUMERS AND END USERS

Star Scientific is deeply focused on ensuring the safety and quality of our production processes, which is paramount in delivering reliable and secure products to our consumers and end users.

S4. Consumers and End users

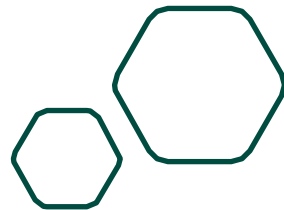
Safety and Quality Assurance

In order to ensuring the safety and quality of our production processes, we have adopted the AS/NZS ISO 45001 and AS/NZS ISO 9001 standards. These internationally recognised standards provide a robust framework for managing workplace health and safety as well as quality management systems.

Our dedication to these standards is evidenced by the initiation of independent assessment and certification processes to verify Star Scientific's compliance. This certification process will be completed as HERO® reaches the deployment stage. By adhering to these standards, we ensure that our innovative work maintains the highest safety standards, further reinforced 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 and experiences of our end users is a critical component of our customer-centric approach. Once HERO® is deployed, Star Scientific will fully implement the AS/NZS ISO 9001 standard, which includes specific requirements to seek and respond to customer satisfaction feedback (section 9.1.2). This systematic approach will allow us to gather valuable insights from our customers, helping us to continuously improve our products and services.



S4. Consumers and End users

Mechanisms for End User Feedback and Engagement

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



By implementing these feedback mechanisms, we ensure that the voices of our end users are heard and addressed, fostering a collaborative and responsive relationship with our customers. This continuous feedback loop is essential for refining HERO® and maintaining the highest standards of quality and safety.

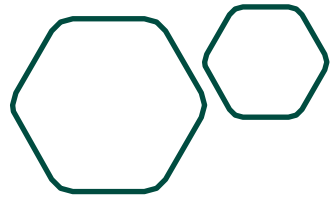
Star Scientific's dedication to consumer and end user satisfaction is at the core of our social responsibility. We strive to not only meet but exceed the expectations of those who rely on our innovative solutions, ensuring their safety, satisfaction, and trust in our products.



GOVERNANCE: **G1. BUSINESS CONDUCT**

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

G1. Business Conduct



Code of conduct

Star Scientific is committed 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.



G1. Business Conduct

Risk Management

Effective risk management is integral to our governance framework. The Board oversees the identification and management of risks that could impact our operations and strategic objectives. We have implemented robust risk management processes to ensure that potential risks are proactively addressed and mitigated.

The governance structure at Star Scientific is designed to support our mission: to pioneer safe, cost-effective, and zero-emission energy solutions that meet today's needs without compromising the future. Our Board of Directors, with their diverse skills and unwavering commitment, play a crucial role in guiding the company towards long-term success. As we continue to grow and evolve, we remain dedicated to upholding the highest standards of governance and ethical conduct.



Transparency and Accountability

As we embark on our sustainability journey with the publication of our inaugural sustainability report, Star Scientific commits to establishing transparency and accountability as foundational elements of our governance structure. For this first report, we have taken significant steps to ensure that the information provided is both accessible and understandable. We aim to foster a culture where transparency is not just about sharing successes but also about acknowledging areas needing improvement. As we develop this practice, we will strive to provide more detailed and frequent updates about our sustainability initiatives and outcomes.

As we continue to grow and learn in our sustainability journey, we will enhance our reporting mechanisms to include more quantitative and qualitative data, ensuring all stakeholders can track our progress effectively. We also plan to establish more robust channels for stakeholder engagement, ensuring that our practices align with their expectations and our stated commitments.



G1. Business Conduct

Anti-Bribery and Corruption Policies

Star Scientific 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.



Star Scientific prohibits bribery and corruption, in any form, whether direct or indirect, whether in the private or public sector, not only within its home country but in all jurisdictions where it conducts business.



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.



G1. Business Conduct



Whistle Blower Protection

The Whistle-blower Protection Policy at Star Scientific underscores our commitment to lawful and ethical conduct. It ensures that employees can report violations 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 wrongdoing.

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 collectively form the backbone of our commitment to uphold ethical standards across all operations of Star Scientific. We continuously review and enhance our policies to ensure they meet the legal standards and reflect best practices in governance and ethics.





EU TAXONOMY

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

Compliance with EU Taxonomy

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

Star Scientific 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's Taxonomy Aligned Economic Activity: Close to Market Research, Development, and Innovation

Star Scientific is primarily engaged in "Close to market research, development, and innovation", an economic activity identified as Taxonomy eligible.

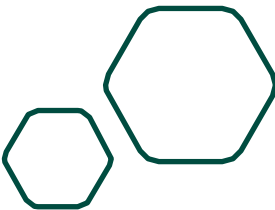
This category encompasses research, applied research and experimental development of solutions, processes, technologies, business models and other products dedicated to the reduction, avoidance or removal of GHG emissions (Research Development & Innovation) for which the ability to reduce, remove or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



Substantial Contribution Criteria	Star Scientific Current Status
<p>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.</p>	<p>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.</p>
<p>Enabling Criteria Compliance: The results of the research, development, and innovation 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.</p>	<p>HERO® substantially reduces GHG emissions by eliminating combustion, aligning with climate change mitigation goals. Through tests done, Star Scientific 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.</p>
<p>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.</p>	<p>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.</p>
<p>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.</p>	<p>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.</p>
<p>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.</p>	<p>Our research and development 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.</p>
<p>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</p> <ol style="list-style-type: none"> 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. 	<p>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.</p>

Requirements for Close to Market Research, Development, and Innovation



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 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 European Union 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 Technology Readiness Level (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 complies with these safeguards, aligning with international standards. The company adheres to human rights standards and conducts regular due diligence. It promotes fair labor practices, including non-discrimination, fair wages, and safe working conditions. Star Scientific 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's operations are responsible and ethical.





THE FUTURE: NEXT STEPS

Looking to the future, Star Scientific remains dedicated to its mission of innovation while ensuring our operations and strategy meet the highest ESG standards. Since our journey to sustainability is ongoing, it requires continuous adaptation to new challenges and opportunities.

Afterword

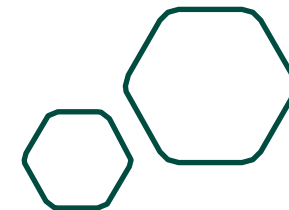
In this report, we have outlined Star Scientific's sustained efforts towards sustainability, guided by the European Sustainability Reporting Standards (ESRS). Our commitment to these rigorous standards reflects our dedication not just to compliance, but to leadership in sustainability.

As we look ahead, Star Scientific remains steadfast in its mission to drive innovation while ensuring that our operations and strategies align with the highest environmental, social, and governance standards. We recognise that our journey towards sustainability is ongoing and requires continuous improvement and adaptation to new challenges and opportunities.

We are grateful to our stakeholders, whose insights and engagement have been invaluable. Their feedback drives our agenda for change and helps us set more ambitious goals. By working together, we can ensure that Star Scientific not only thrives economically but also contributes positively to our planet and communities.

Our commitment to transparency and accountability is unwavering. As we move forward, we will continue to enhance our sustainability practices, measure our impact, and communicate our progress. We invite our stakeholders to join us in this journey, as we strive to build 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:

We at Aspect Advisory are thrilled to be part of Star Scientific's sustainability journey, which begins with this Sustainability Report.

As experienced professionals, we have guided the Star Scientific team through all aspects of sustainability reporting, with a particular focus on the European Sustainability Reporting Standards (ESRS).

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



✉ info@aspectadvisory.eu

🌐 www.aspectadvisory.eu



DR. CHRISTIAN SCHAEFFLER
Managing Director







PROF DR. CHRISTIAN SCHMALTZ
Managing Director



STUART THOMSON
Managing Director



Star Scientific Limited
Suite 301, Level 3, 828 Pacific Highway
Gordon NSW 2072, Australia
+61(02) 9376 6400
info@starscientific.com.au
www.starscientific.com.au

-  @StarScientific_
-  @StarScientificLimited
-  Star Scientific Limited
-  Star Scientific Limited