



## Compressed Hydrogen Transport The Future of Energy



ASX / MEDIA ANNOUNCEMENT

14 OCTOBER 2020

# DEVELOPMENT OF WORLD FIRST COMPRESSED HYDROGEN SHIP TO EXPORT 'ZERO CARBON' ENERGY

Global Energy Ventures Ltd (ASX: **GEV**, the **Company**) is pleased to provide the following details on the development of a new compressed Hydrogen ship design (**H2 Ship**) to transport clean, renewable energy.

### HIGHLIGHTS:

- **GEV is positioning as an early mover in the future of energy, leveraging its technical expertise in the engineering of marine pressure vessels to develop a compressed hydrogen ship for export and transport to customers demanding access to zero carbon energy.**
- **GEV's H2 Ship will have a storage capacity of up to 2,000 tonnes (23 million m<sup>3</sup>) of compressed hydrogen. Smaller capacity ships will be evaluated by GEV for demonstration purposes based on specific pilot export projects.**
- **The Company anticipates that detailed engineering will be lodged as part of the American Bureau of Shipping (ABS) Approval in Principle process in early 2021.**
- **Hydrogen is a clean burning fuel that can be produced in several ways, including using renewable energy produced from solar, wind and hydro. Such hydrogen then needs to be transported to industries, providing them with green energy with zero carbon emissions.**
- **Governments and major oil and gas companies are aligned to accelerate 'net-zero carbon' targets, with significant stimulus funding and capital expenditure being directed to hydrogen as the pillar for decarbonising the world's heavy emitting industries.**
- **Australia leads the world with a National Hydrogen Strategy that includes the establishment of 'Hydrogen Hubs' for production and export to the country's major energy trading partners across the Asia Pacific region.**
- **GEV will focus on Australian export projects, with several projects advancing through pilot phases and now looking to export markets.**
- **Funding options from existing and newly announced Australian Government R&D programs are being assessed under the Federal Government commitment of A\$1.9B to the development of renewable technologies.**

**Maurice Brand, Executive Chairman & CEO commented:** *"Today we are excited to announce the Company's hydrogen strategy to develop a new class of ship for the marine transportation of hydrogen. GEV sees Australia as the global leader for establishing a national hydrogen strategy and industry with major funding programs in place. Australia has also established future hydrogen export agreements with regional customers in Japan, Korea, Singapore, and most recently Germany.*

*Our company was established on entrepreneurial principles and to be the leader in new forms of marine transport of energy. To be focussed on a new class of vessel to transport hydrogen is now timely given the global push by governments and major corporates to focus on 'net-zero carbon' policies, with hydrogen as a pillar for decarbonising heavy carbon emission industries.*

*The launch of a new compressed H2 Ship does not detract from our focus on the commercialisation of the CNG Optimum as we progress multiple opportunities in the America's and globally."*

**Martin Carolan, Executive Director Corporate & Finance commented:** *"Over the course of 2020, the Company has been closely monitoring the growing support for hydrogen as a clean energy source. In our view, the application of GEV's compressed hydrogen vessel will be very competitive against other marine transport options, particularly to Australia's regional Asia Pacific customers.*



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The Company has deep expertise and a history of successful design and approval of a new class of marine vessels that utilise compression for the storage of energy. It is logical for GEV to expand its offering to a growth sector in 'zero-carbon' energy fuels and leverage the key assets we have in our people and IP.

An accelerated program for the ship design, engineering and initial stage of ABS approvals will position GEV as a leading solution for the export of hydrogen from Australia to the key energy markets in Asia Pacific.

The Australian Government, and other countries in Europe, have committed to provide significant financial stimulus to accelerate Climate Change Policy decisions and directly implement funding and policy support to further develop the full supply chain of hydrogen, including the growth of export markets. There is a growing list of Australian hydrogen projects moving through successful pilot and into a domestic scale-up phase that have export plans.

GEV recognises the key to driving down the economics of hydrogen production will be scale and the key to scale will be developing an export industry."

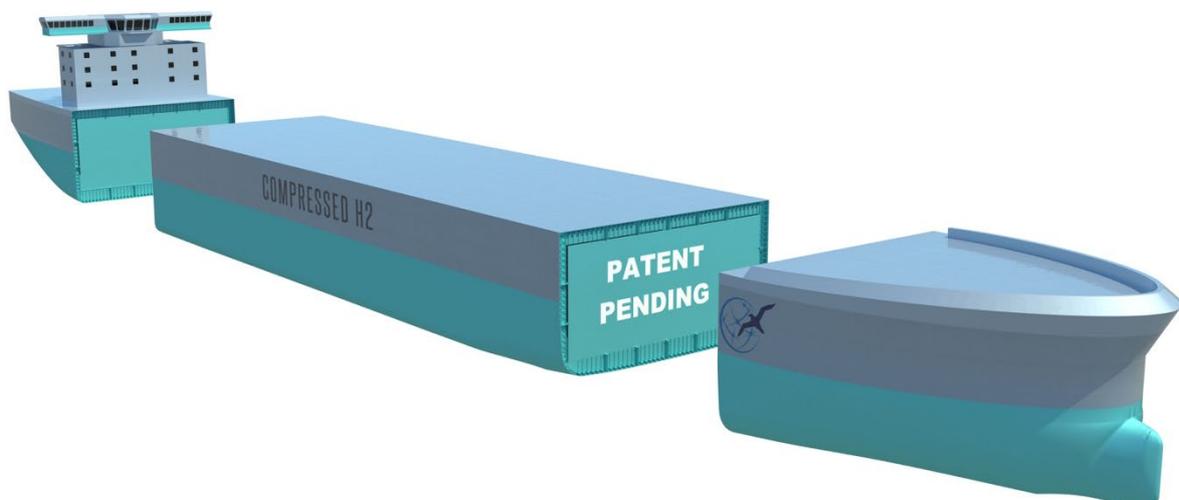
### ADVANCING ENGINEERING AND APPROVALS FOR A COMPRESSED H2 SHIP

The Company's Marine Engineering and Development Teams have established an accelerated program to develop the technical specifications for an innovative compressed H2 Ship, including the cargo containment system, to be designed in accordance with the American Bureau of Shipping (ABS) rules and guidelines. The Company is confident that its credentials in successfully attaining design approvals with ABS, on two occasions, utilising proprietary marine designs will enable GEV to execute an efficient and cost effective program to achieve the first key milestone of Approval In Principle (AIP) from ABS targeted for completion in the first half of 2021.

Figure 1 is an illustration of GEV's compressed hydrogen ship. The ship and its innovative cargo system are in the patent process and GEV expects to receive broad patent protection for this novel ship, further extending our intellectual property suite. The containment system will include ambient temperature hydrogen at a target pressure of 3,600 psi (or 250 bar). GEV's H2 Ship will have a storage capacity of up to 2,000 tonnes (23 million m<sup>3</sup>) of compressed hydrogen. Smaller capacity ships will be evaluated by GEV for demonstration purposes based on specific pilot export projects.

With the rapid advancement fuel cell technology for vessels, GEV intends to include engines that burn pure hydrogen, providing a 'zero-carbon' shipping solution.

**Figure 1: Illustrative ship design - Compressed H2 Ship**



Funding options from existing and newly announced Australian Government R&D programs are being assessed. The Company has successfully applied for and received Australian R&D funding programs for the completion of ABS full design approvals for the CNG Optimum ship in 2018-2019, and expects the new compressed H2 Ship will also qualify



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for similar R&D funding, along with meeting the criteria for a number of specific new R&D funding programs now set out for the development of hydrogen technologies.

#### HYDROGEN TO EMPOWER THE ENERGY TRANSITION

Hydrogen is a clean-burning gas that can be used for energy storage, heat, transport and industrial processes, and is increasingly being seen as having a major role in the decarbonisation of the energy sector.

The production of hydrogen has been in existence for many decades and is based on existing technologies. Historically production has occurred from fossil fuels, namely coal and natural gas, with a combination of carbon capture and storage to produce brown and blue hydrogen. Today, hydrogen is gaining popularity as the pillar for the next generation of renewable energy sources to achieve 'net-zero carbon' targets.

Numerous governments and corporations have now mandated that the future production of hydrogen will focus on green hydrogen using clean, renewable energy. Solar, wind or hydro power will be used to generate electricity, which is then used to split hydrogen from water using a process of electrolysis, a well proven and established technology.

Green hydrogen delivers a high energy density fuel source that does not emit CO<sub>2</sub> or greenhouse emissions during consumption. The expected applications will include heavy emission industries, such as: power generation, petrochemical, long-haul transport (road and marine), steel, cement, and fertilizer.

Importantly, hydrogen is already a well-established energy source that has been safely used in industries in Australia for many decades.

For more information and resources on the hydrogen industry, please refer to the Australian Hydrogen Council's website: [www.h2council.com.au](http://www.h2council.com.au)

#### HYDROGEN SUPPLY CHAIN SIMILAR TO NATURAL GAS

The infrastructure and organisations involved in a hydrogen supply chain share many similarities to that of exporting and shipping natural gas, in that hydrogen is first produced then loaded, transported, unloaded and distributed at the market.

GEV benefits from its experience in designing solutions for compressing and loading high pressure gas, as well as having established business relationships with key suppliers who have already begun certifying and demonstrating systems that have been adapted for hydrogen.

GEV has commenced discussions with several technical groups to fast-track the screening of viable options for a compressed hydrogen supply chain.

#### AUSTRALIA LEADS THE WORLD WITH A NATIONAL STRATEGY AND FUNDING FOR NEW HYDROGEN PROJECTS AND TECHNOLOGIES

Australia is setting the benchmark for hydrogen industry development, with the foundations laid from the release of Australia's National Hydrogen Strategy in 2019. This report followed a National Hydrogen Roadmap in 2018 by the CSIRO delivering a blueprint for the industry.

*"Australia is well-placed to make hydrogen its next big export. We have all the natural resources needed to produce it, a track record in building large-scale energy industries and a reputation as a proven partner to Asia's biggest energy importers". National Hydrogen Strategy, 2019*

The National Hydrogen Strategy also included funding support of A\$500 million to develop projects and markets for domestic use and future export markets. More recently in September 2020, the Australian Government announced a A\$1.9 billion investment package over 10 years in five new energy technologies, with Hydrogen named as a priority focus.

Australia witnessed a significant number of hydrogen projects announced across several states and territories, including a number of key industries implementing hydrogen into their supply chains to reduce emissions.



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GEV has commenced the process of identifying a shortlist of suitable projects already through the pilot stage of hydrogen production and have a strategy to export hydrogen from the North West of Australia into the Asia Pacific region. Figure 2 provides an overview of announced Australian hydrogen projects targeting such export opportunities.

**Figure 2: Overview of Australia's Hydrogen Projects & Proximity to Export Market**



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**This ASX announcement has been authorised by the Board.**

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# Compressed Hydrogen Transport

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### ABOUT GLOBAL ENERGY VENTURES LTD

Global Energy Ventures Ltd was founded in 2017, with the Company's mission to create shareholder value through the delivery of integrated marine pressure vessel solutions transporting energy to regional markets. The business model is to build, own and operate integrated energy transport projects for either natural gas or hydrogen.

The primary focus is the development of integrated Compressed Natural Gas (CNG) marine transport solutions with the Company's construction ready **CNG Optimum ship**. CNG is a well proven gas transport solution with design and commercial advantages along with being safe and a 'lower emission' solution for the transport of gas than in the form of liquified natural gas (LNG).

With the world's focus on Energy Transition gaining momentum, the Company has also introduced the world's first **Compressed H2 Ship** that will support the transport of hydrogen as a green energy fuel of the future. Hydrogen's role in the future energy mix will greatly assist governments and corporations with their respective 'net-zero carbon' targets through the decarbonisation of heavy emitting industries.

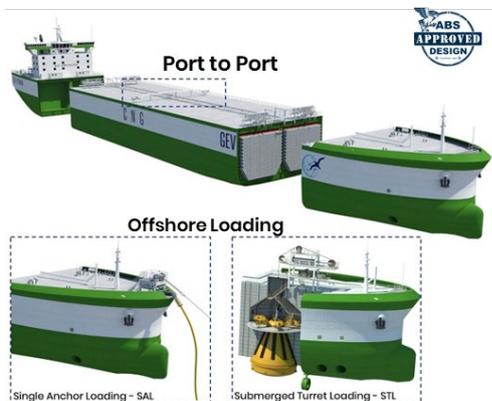
#### This will be achieved by:

- Continue to maintain global leadership in marine pressure vessel designs and intellectual property.
- Pursue a portfolio of CNG Optimum projects to improve and mitigate against binary outcomes and offer CNG project stakeholders' flexible commercial arrangements.
- Advance the future transport of green energy through the development of the compressed H2 Ship.
- Employ world class management and staff that are leaders in their chosen discipline.
- Maintain the highest standards of efficiency, safety and environmental responsibility.

For more details on the Company please visit [www.gev.com](http://www.gev.com)

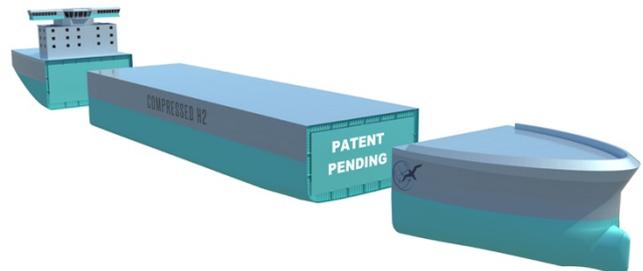
### CNG Optimum Ship

Approved for Construction & Ready for Commercialisation



### Compressed H2 Ship

Under Development



**DISCLAIMER:** This announcement may contain forward looking statements concerning projected costs, approval timelines, construction timelines, earnings, revenue, growth, outlook or other matters ("Projections"). You should not place undue reliance on any Projections, which are based only on current expectations and the information available to GEV. The expectations reflected in such Projections are currently considered by GEV to be reasonable, but they may be affected by a range of variables that could cause actual results or trends to differ materially, including but not limited to: price and currency fluctuations, the ability to obtain reliable gas supply, gas reserve estimates, the ability to locate markets for CNG, fluctuations in gas and CNG prices, project site latent conditions, approvals and cost estimates, development progress, operating results, legislative, fiscal and regulatory developments, and economic and financial markets conditions, including availability of financing. GEV undertakes no obligation to update any Projections for events or circumstances that occur subsequent to the date of this announcement or to keep current any of the information provided, except to the extent required by law. You should consult your own advisors as to legal, tax, financial and related matters and conduct your own investigations, enquiries and analysis concerning any transaction or investment or other decision in relation to GEV.

\$ refers to Australian Dollars unless otherwise indicated.