



COMPANY
PROFILE

WELCOME TO ELEMENT ONE

Who are we? We are a team of scientists, engineers, hydrogen and renewable fuels experts, united by a vision to make hydrogen (Element One) accessible.

Producing sustainable technology, systems integration, consultancy solutions. Introducing game changing technologies to the world energy market. A collaborative effort to engineer sustainable solutions for a greener, cleaner future for our planet and its inhabitants.

Zero compromise

- ✔ Australian based company
- ✔ Sustainable & green solutions
- ✔ Refueling the future



OUR VISION

Our goals are to:

- Make green energy an economic reality
- Eliminate the use of diesel
- Empower Australia to lead the world in green hydrogen production and utilisation.



Production

Renewable energy production of hydrogen that is transformed into sustainable alternative industrial chemicals and fuels.



Storage

Long duration storage systems for renewable Hydrogen carriers and industrial liquids. In systems that are comparable with today's standards that are both easy, safe and reliable.



Delivery

Delivering hydrogen solutions with world class energy densities as liquid renewable fuels.



Dispense

Offering solutions for dispensing sustainably produced high energy dense renewable fuels.

' Closing the sustainable energy loop '

It's not a question of when. Change is needed immediately and technology is no longer a barrier. Element One has teamed with industry professionals and like-minded investors, to provide the solutions required to reduce emissions and begin the transition.

End-to-end renewable production and power solutions. We solve the hydrogen integration puzzle with leading propriety systems, products and technologies.



WHY HYDROGEN?

We're changing what's in the bucket!

Hydrogen is the most abundant element on earth

Green hydrogen is the answer to decarbonizing the most carbon intensive industrial and transport sectors and we now have the technology to the biggest problem facing hydrogen production, to deliver in a cost-effective way that when distributed and delivered, is comparable to existing fuel systems.

Hydrogen is not a “fuel” in and of itself, it is an energy carrier.



With our current H₂ from Ammonia technology, Ammonia mobility offers two major advantages over battery-electric and gaseous or liquid hydrogen mobility: fuel cell vehicles with a full tank of ammonia can cover a distance of around 1500 kilometres. Advances in battery technology will certainly make it possible to increase the range for EV's over the coming years. The greater space required to install the batteries will however make it impossible to approach that of an ammonia fuelled vehicle.

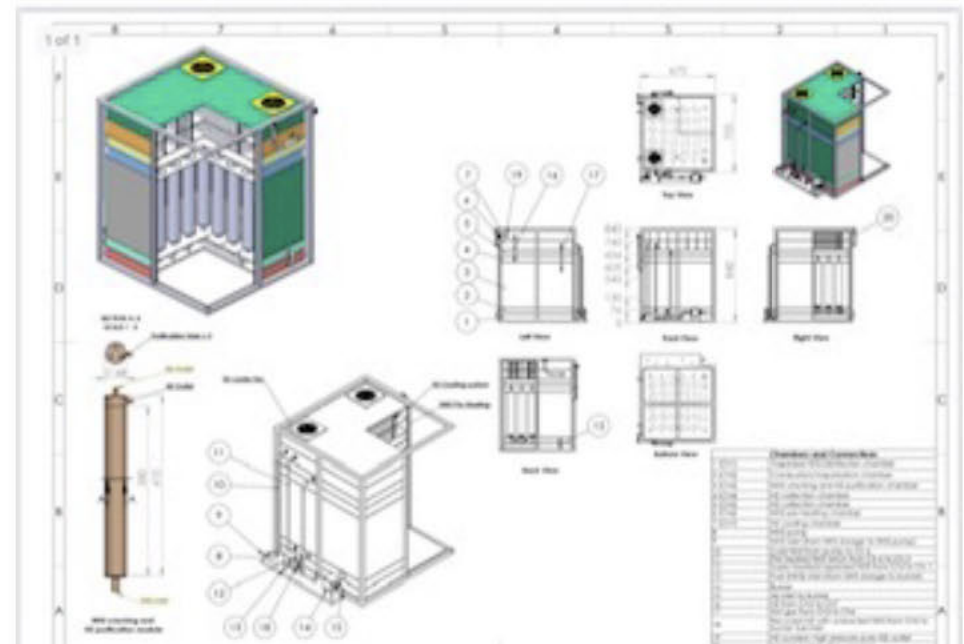
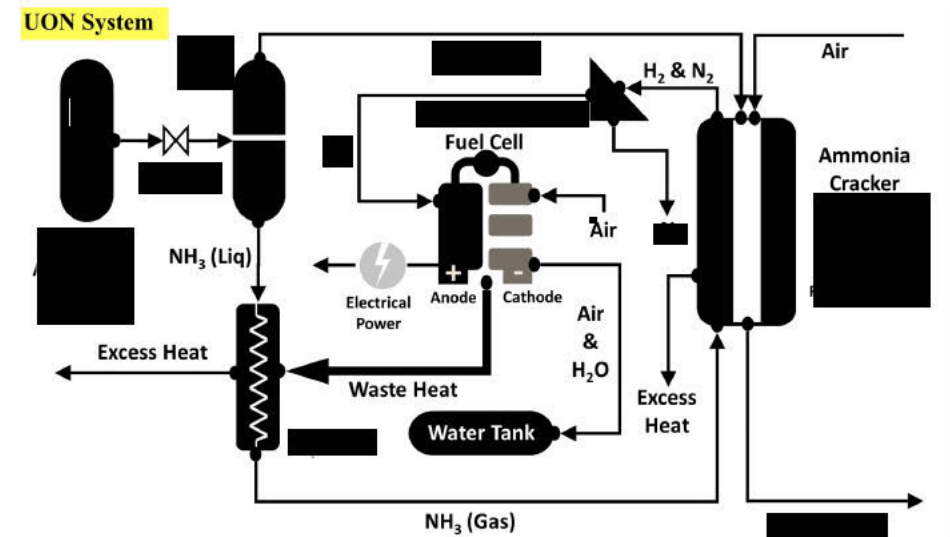
Another factor is that it only takes a few minutes to replenish an empty ammonia tank while H₂ only has less energy density and takes considerably larger and more costly infrastructure. Charging a battery conversely takes three quarters of an hour to several hours depending on the charging current. This can in particular be challenging in long-distance traffic if nationwide charging infrastructure has not yet been established. And yet all these sustainable technologies do have one thing in common – in all cases the vehicle is powered by electricity that drives an electric motor. A high-voltage battery is also installed in a fuel cell vehicle to store the energy from the fuel cell and any regenerate braking. Element One will develop electrically powered vehicles to offer its customers the ideal solution.

Element One sees the Ammonia reformed H₂ fuel cell as complementary technology to battery-powered drives. We'll be relying on a mix of both these sustainable drive systems. Our aim is to provide our customers with zero-emission solutions for all mobility and stationary applications.

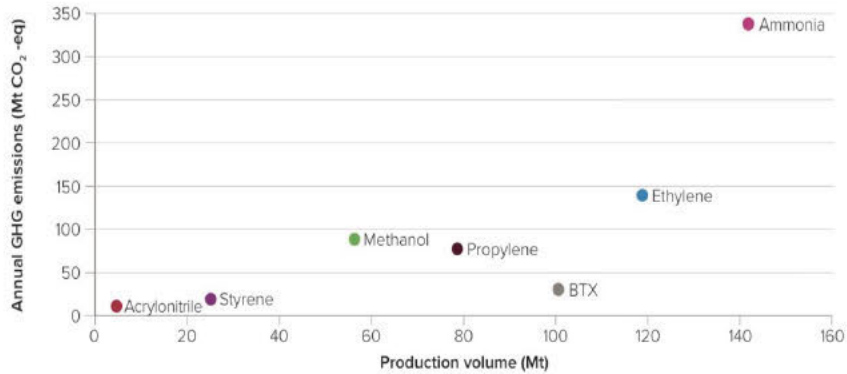
Reformer TECHNOLOGY

CRACK-IT

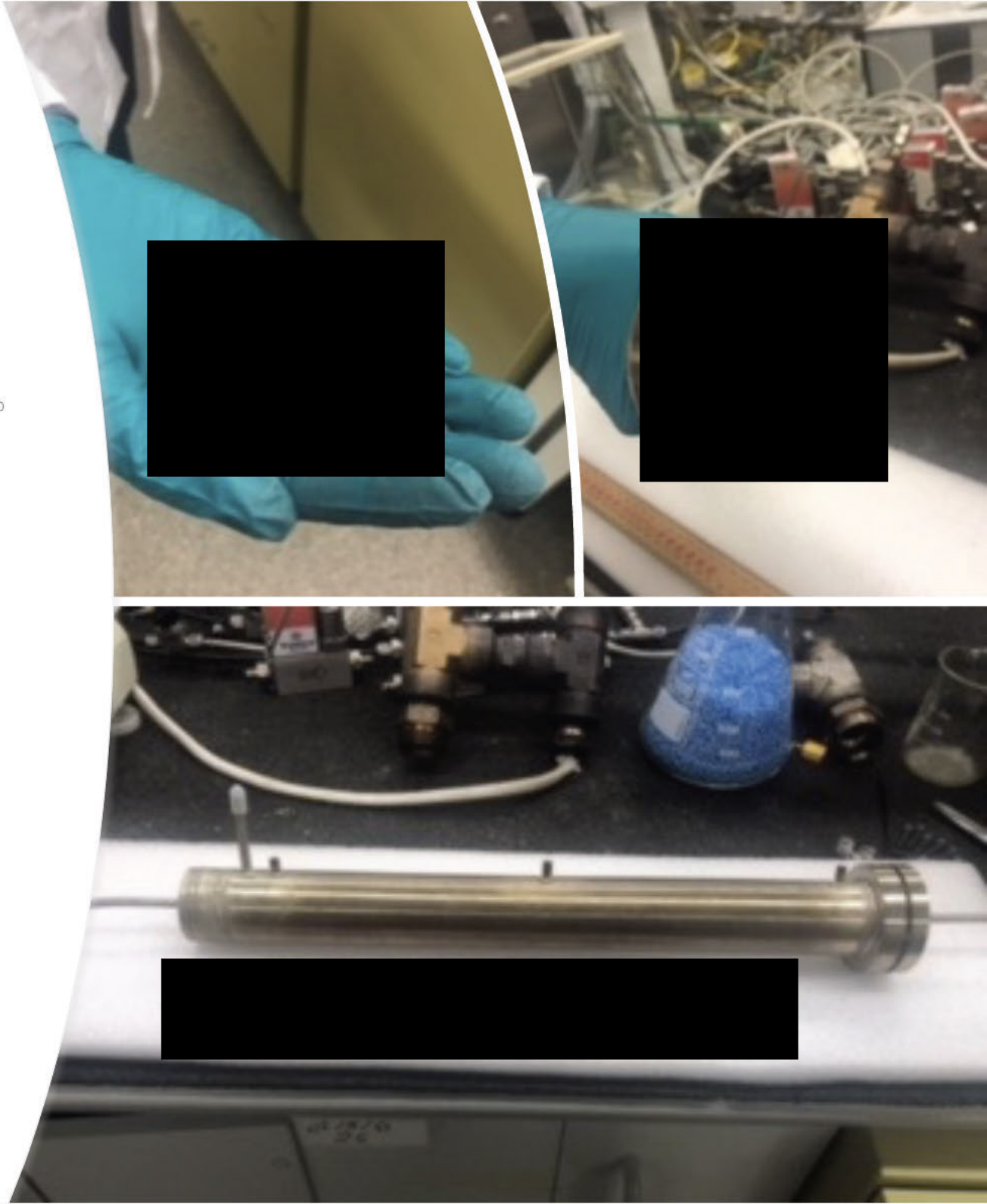
- A novel ammonia to hydrogen reforming technology for mobile and stationary applications.
- This prototype can produce 6kg of high purity hydrogen (99.9999%) per hour. At a pressure of 17 bar and temperature of 30°C
- Can be scaled both for large and small application



Greenhouse gas emissions for selected high production volume chemicals for 2010⁴.



BTX – Benzene, Toluene, Xylene (aromatic chemicals). These 2010 numbers are the most recent published figures.
 Note: Ammonia production in 2018 was 176Mt and generated around 500 million tonnes of carbon dioxide (per annum).

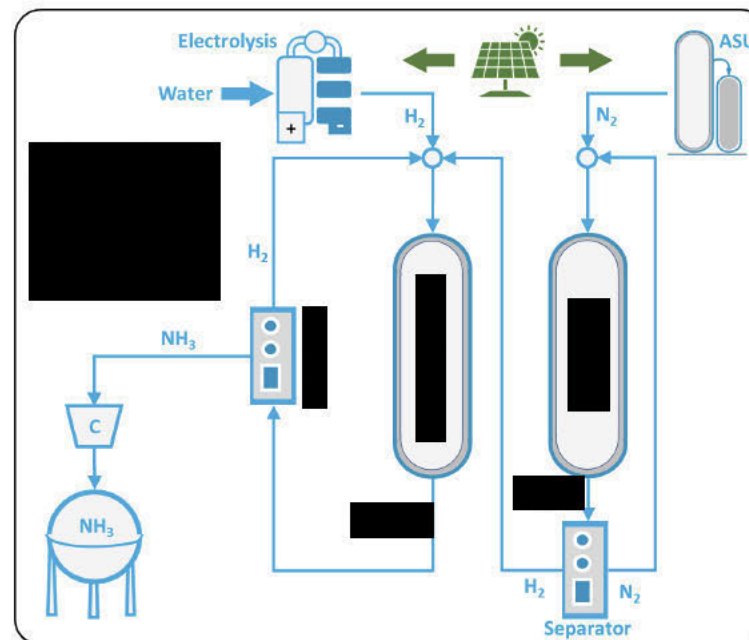


Hydrogen Storage	Per 1000kg
Australian Current Standard <100bar	8kg
350bar	24kg
700bar	42kg
LH2 -253 Degrees	75kg
Metal Hydride	80-90kg
Methanol	98kg
Ethanol	108kg
Ammonia	177kg

Transformer TECHNOLOGY

Ammonia Synthesis

- Ammonia is a currently traded world commodity with over 100 billion dollars of the stuff traded annually. It is also one of the most harmful products on the planet producing more CO₂ per kilogram than any other chemical used in its quantities.
- Ammonia currently satisfies the production of fertilizers and explosives petrochemicals pharmaceuticals chemicals and cleaning agents; it has long been produced by the Haber Bosch process and requires enormous amounts of natural gas to produce both hydrogen then ammonia. There is less than 0.02% of the worlds ammonia that is classified as green ammonia the current price for ammonia is AUD\$10 per kilogram. Element One under an exclusive partnership with University Of Newcastle and the lead Professor Behdad Moghtaderi have developed A revolutionary new production method that requires very low capital costs operational costs and energy and can be completely synthesized with renewable energy.



Comparison with Fossil Fuel Based Ammonia in Different Markets	Wholesale Price at Major Global Markets (\$/t)			
	Asia / Oceania	Europe	North America	Latin America
Fossil-Fuel Based Ammonia	1100	2616	2294	1192
AMMONIAC Based Ammonia (Green)	464	464	464	464
Difference	636	2153	1831	728
AMMONIAC Viability	Viable	Viable	Viable	Viable

Renewable TRANSPORT

Comparing internal combustion engines with Fuel Cell Battery Electric Vehicles



Standard Diesel ICE's

1000 litres of Diesel weighs 820kg with an energy density of 12KW/kg. Equating to 9840KW.

Typical ICE's are around 25% efficient leaving us 2460KW of useable power

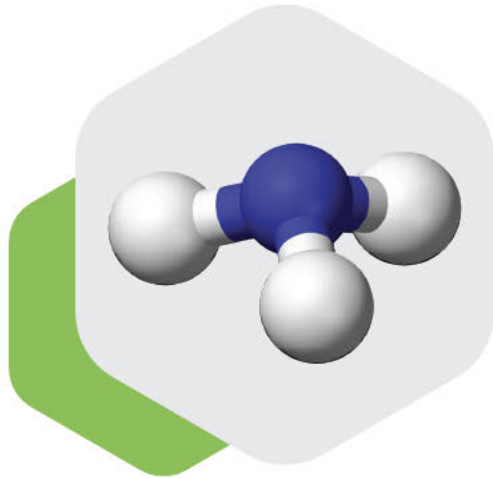
Element One's Ammonia fuelled FCBEV

1000 litres of Ammonia contains 121kg of H₂ with an energy density of 39KW/kg. Equating to 4719KW.

The efficiency of a fuel cell is over 60% and electric motor 92% leaving us 2640KW of useable power. FCBEV has the ability to use regenerative braking as much as 15% allowing us to squeeze a further 396KW.

1000L	Litres	1000L
Standard	Refueling	Similar to LPG 100gal/min
9840kw	Energy Density of Fuel	4719kw
25%	Efficiency	56%
No	Regeneration	Yes up to 15%
High	Maintenance	Low to Moderate
2500kw	Overall usable Energy	3000kw

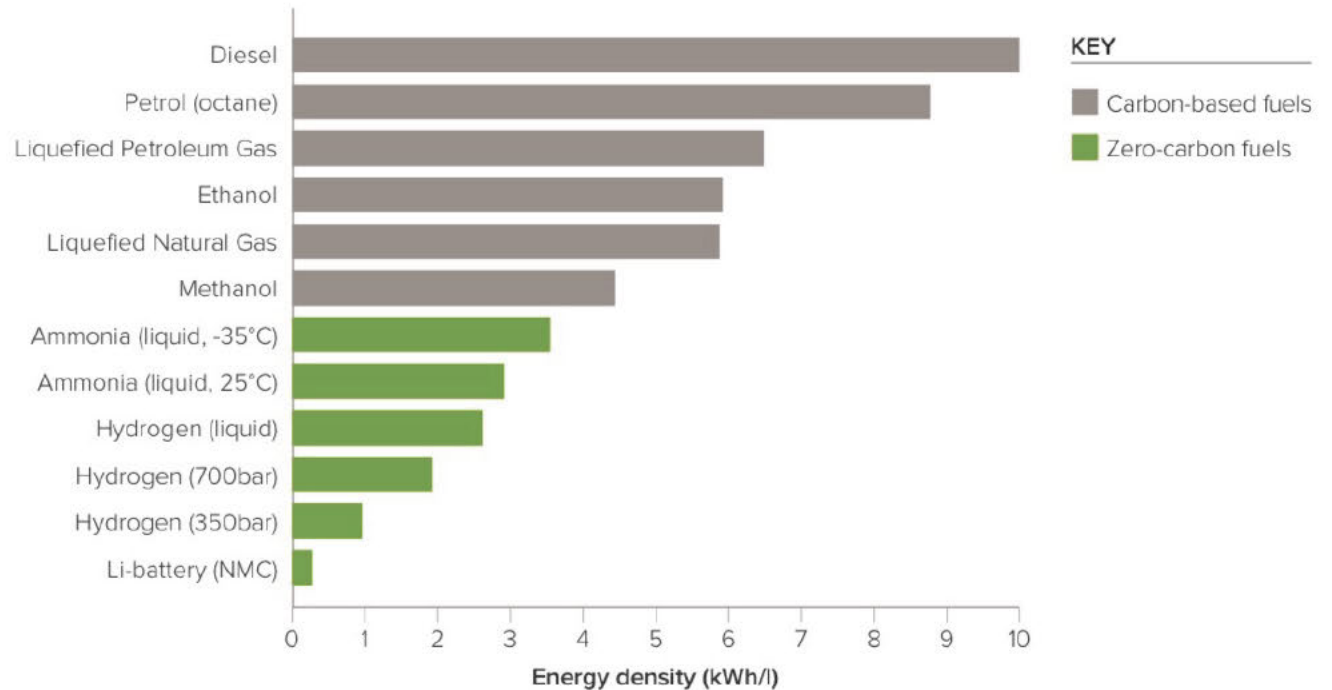
FUEL COMPARISON



Why Ammonia?

Ammonia holds more Hydrogen than Hydrogen, a liquid at low pressure and ambient temperature, which is easily transported, with more energy density than LH2 and far less Capex and Opex..

The volumetric energy density of a range of fuel options.





OFF-TAKE INDUSTRIES



- ✓ *Fertilizers*
- ✓ *Explosives*
- ✓ *Chemical Processing*
- ✓ *Synthetic Fibers*
- ✓ *Refrigeration*
- ✓ *Viable Diesel replacement fuel*

INDUSTRY PARTNERS

Element One is proud to collaborate with a wealth of knowledge and industry experience of our partners



**University of
Newcastle**

Research and development of
renewable fuels and reformer
technologies



**University of
New South Wales**

Researching new photocatalyst
materials for optimized
hydrogen production



**University of
Queensland**

Working with ifuel cell
technology to find new materials
for cost effective energy production



Wolff Power

•
Systems integrator



Amp Control

Power Systems Designer



PME Services

Heavy Duty E-Drivetrain Design



elementone

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