



Displacing Diesel

AFC Energy Capital Markets Day

8th May 2024



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Welcome – Gary Bullard (Chair)

Zero emission power
for a new world

Strategic Overview – Adam Bond (CEO)

Zero emission power
for a new world

Agenda

Welcome

Strategic Overview

H-Power Generator Scaling Up

Organisational Readiness to Scale

Ammonia Cracking: The Billion £ Opportunity

Bringing the Cracker to Market

Outlook

Questions ?

Gary Bullard (Chair)

Adam Bond (CEO)

Dan Evans (CEO – Speedy Hire)

Rami Elayan (CEO – TAMGO)

Dr. David Harvey (CTO – Fuel Cells)

Benedikt Eska (CEO – Axiosus)

Jeff Plato (President – Illuming Power)

Peter Dixon-Clarke (CFO)

Adam Bond (CEO)

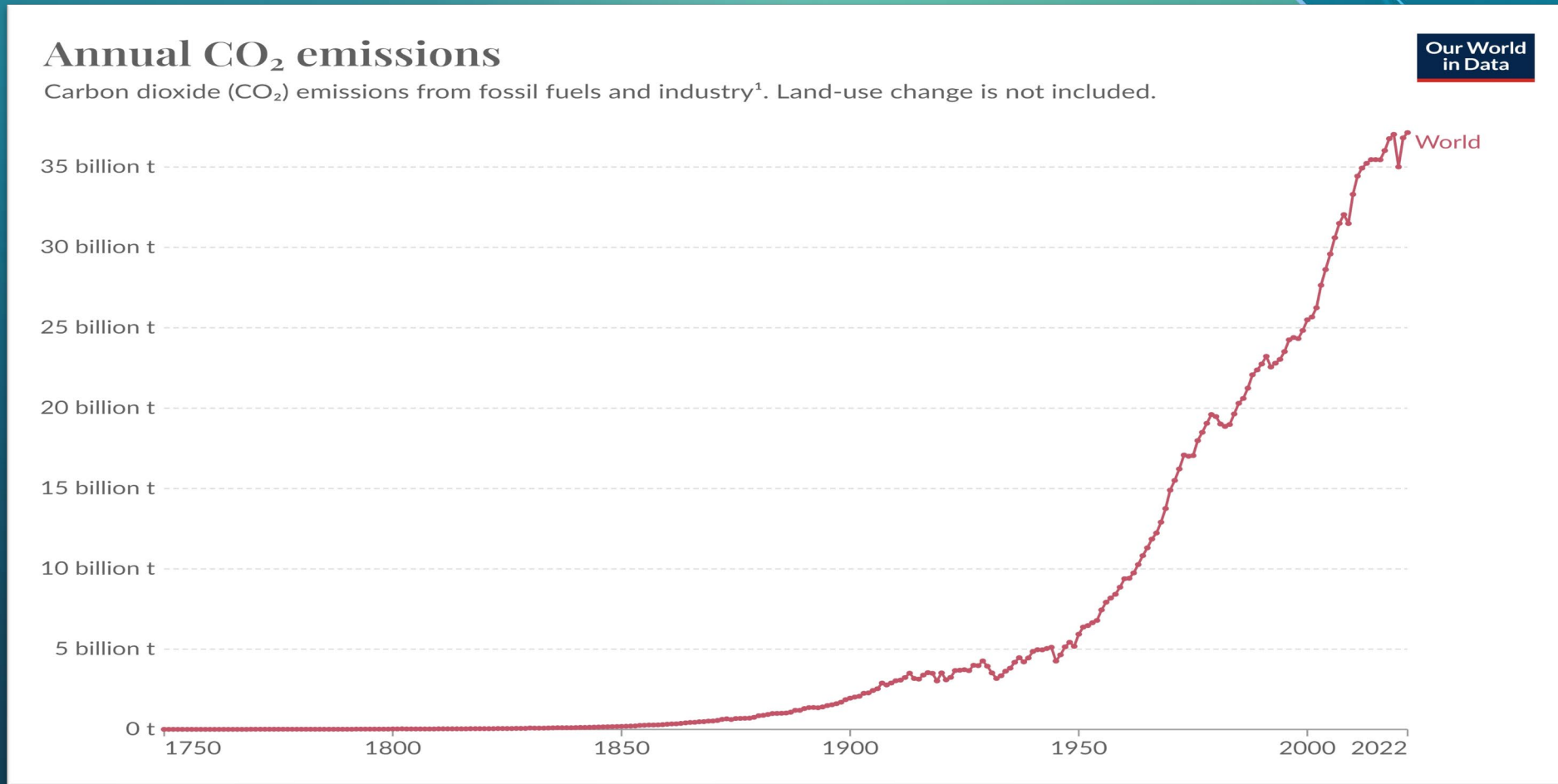
Dr. Mike Rendall (CTO – Fuel Conversion)

Darren Sharpe – ICL

Steven Swaby - ICL

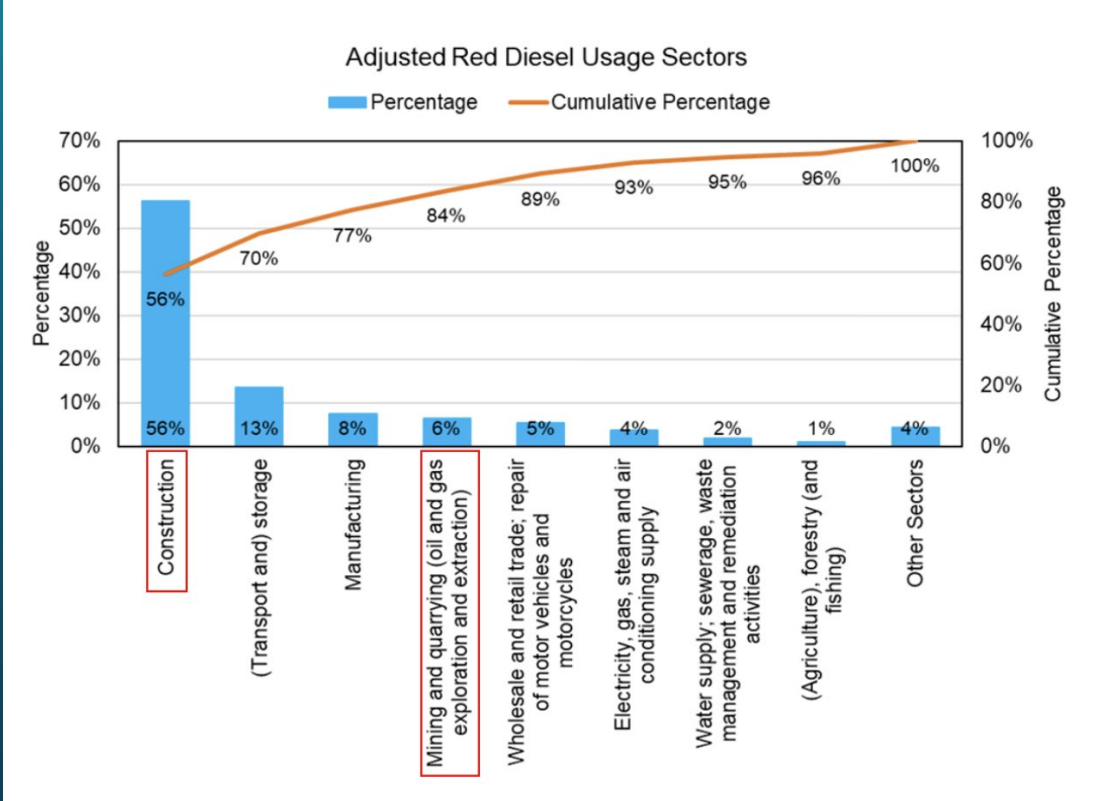
Adam Bond (CEO)

Greenhouse Emissions Continue to Rise ...



Data source: Global Carbon Budget (2023)
CO₂ emissions - Our World in Data

UK Sectors Most Impacted by Diesel



Source: <https://assets.publishing.service.gov.uk/media/63ef4143d3bf7f62ef2b17e8/red-diesel-replacement-phase-2-competition-webinar-20230125.pdf>

Central London (Barbican) Case Study: April 2024



Assuming:

- 1Megawatt diesel generator operates 10 hrs per day
- 5 days per week / 52 weeks a year
- 50% load
- 0.79 Metric Tonnes of CO₂ per Megawatt Hour *

1,027 tonnes of CO₂ per annum

Not taking into account NO_x, particulate matter, noise and smell

* Source: <https://www.feace.com/single-post/the-carbon-footprint-of-diesel-generators>

1MW Diesel Generator Operating Outside the Barbican in April 2024

Central London (Barbican) Case Study: April 2024

Putting 1,027 tonnes of CO₂ per annum into context:



“At atmospheric pressure, 1 tonne of CO₂ has the same volume as about a hot air balloon”

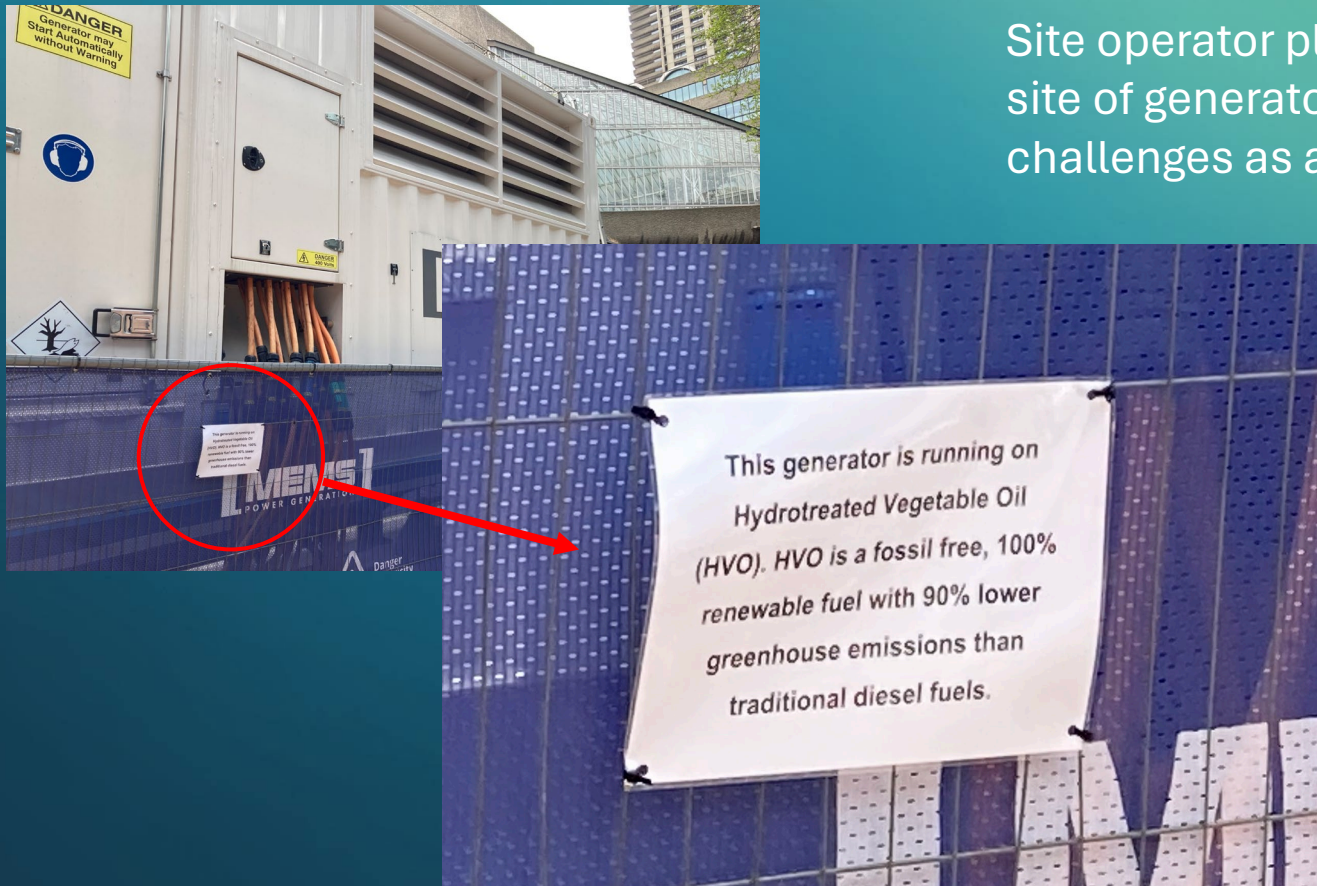
Speech: “UK Opportunities in Carbon Capture: Spectator Energy Summit” Energy Security Secretary Grant Shapps: Published 26 April 2023

<https://www.gov.uk/government/speeches/uk-opportunities-in-carbon-capture-spectator-energy-summit>

Central London (Barbican) Case Study: April 2024

Fast Forward 2 Weeks ...

Site operator placed explanation of fuel choice on site of generator ... however, HVO isn't without its challenges as a transitional fuel ...



Hydrotreated Vegetable Oil (HVO) – A Short Term Alternative?

Environment Agency (2022)

Environment Agency looks to block HVO

20 Sep 22 Just as hydrotreated vegetable oil (HVO) was starting to become the fuel of choice for the construction industry, the backlash has begun.



Environment Agency contractors have been told that they must stop using HVO fuel on EA sites from 30th September due to concerns that it is not always as environmentally friendly as advertised.

The EA said only that the use of HVO was under review. No final decision had been taken yet and suppliers will be notified when the assessment is complete, it said.

Balfour Beatty HVO Position Paper (2022)

Balfour Beatty

Position paper Hydrotreated Vegetable Oil (HVO) and Gas to Liquid (GTL)

Introduction

Balfour Beatty's key objective when it comes to the fuel we use is to phase out diesel and other fossil fuels in all of our operations as quickly as possible, in line with our ambition to go Beyond Net Zero Carbon by 2040 as set out in our Sustainability Strategy Building New Futures. As also set out in this Strategy, we are determined to act responsibly and to always consider the full implications of our actions. This includes making sure that we are not solving one environmental challenge and creating another.

HVO (Hydrotreated Vegetable Oils) and GTL (Gas to Liquid) fuels have been widely marketed as a sustainable solution to fossil fuels, reducing localised air pollution and their impact on climate change. These claims are attractive to the construction sector as it tries to reduce the carbon emissions from its operations, as the sector is reliant on heavy plant, with only a limited availability of electric, hybrid and hydrogen powered alternatives. As a consequence, a number of our customers and supply chain partners are exploring or have committed to HVO and GTL.

While Balfour Beatty is looking closely at HVO potential through some trials, there are serious issues that need to be ironed out before we think they could be committed to, particularly in terms of full traceability and carbon footprint claims. At the heart of our concerns is the fact that, at the moment, the supply chains in this area are complex and opaque, with insufficient information provided about the sources, transportation and production methods. Given supplies of HVO from sustainable sources are currently limited, there is a strong likelihood that a sharp increase in demand could drive an increase in palm oil derived HVO or palm oil used as a livestock feed alternative, contributing to further global deforestation. Even sustainably certified schemes have limitations in this area, as they do not take into consideration the significant impact of these indirect land-use changes or the full lifecycle footprint.

Balfour Beatty takes its environmental responsibilities seriously and, given its size and purchasing power, recognises its unique position to drive truly sustainable outcomes in the construction sector. We are committed to ensuring that our sustainability, governance and transparency processes are enforced. This means that we must take into account all of the environmental, economic and social aspects of HVO before we could agree to any wider-scale use in our operations. Indeed, we agree with the Royal Academy of Engineering:

"The carbon footprint and other sustainability aspects of biofuels should be evaluated on a life cycle basis across full supply chains to avoid shifting the burdens from one part of the life cycle or supply chain to another."

This is a situation we are keeping under constant review. We will continue to assess all the key data and information that is published on HVO. However, until we have understood all the potential impacts, Balfour Beatty will not be making a commitment to HVO.

Given that the ultimate source of many HVOs in particular is uncertain, even in those that are said to be sustainably sourced, and the real risk that significant increase in use on construction sites across the country could be causing increased carbon emissions in other parts of the world due to land use change, we encourage the Government to undertake a review of their use in the UK and to set clearer requirements around their use on publicly funded schemes.

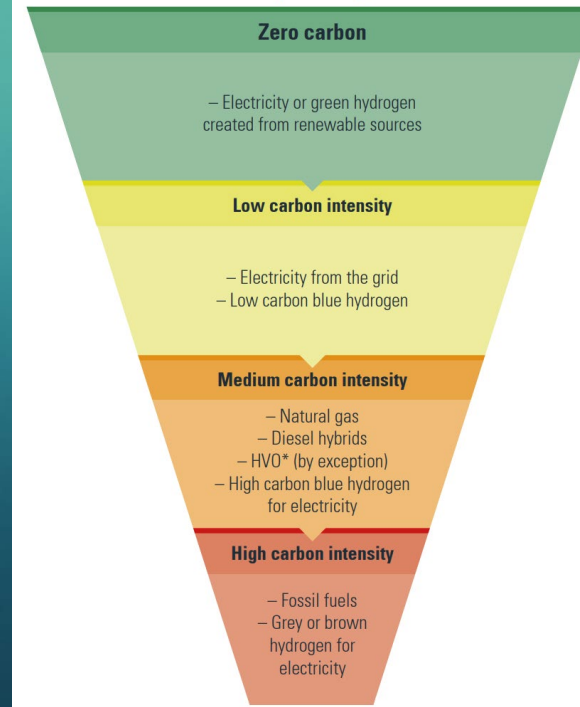
Although we are not adopting HVO until such a point that these issues have been resolved beyond doubt, we are committed to reducing our carbon footprint as quickly as possible by other means and innovations, with the intention of fast-tracking better solutions as they emerge, as outlined in more detail in the following pages.

We are working collaboratively with our customers and supply chain partners on this issue to understand their priorities and approaches.



Electric telehandler

Choosing the right fuel



Source: <https://www.theconstructionindex.co.uk/news/view/environment-agency-puts-blocks-on-hvo>

Source: <https://www.balfourbeatty.com/media/3bulxfbs/hvo-positioning-paper.pdf>

What Are the Alternatives to Diesel Generators?

	Zero Emissions	Footprint	Generates Power	24/7 Power	Sustainable Fuel
Solar	✓	✗	✓	✗	✓
Wind	✓	✗	✓	✗	✓
Battery	✓	✓	✗	✗	N/A
HVO	✗	✓	✓	✓	✗
H-Power Generator	✓	✓	✓	✓	✓

UK Construction Projects Displacing Diesel This Decade

HS2

We want to speed up the pace of change across the wider construction industry, working with our contractors to end the use of diesel on all HS2's sites by 2029.

Everything inside our site boundaries will be powered by diesel-free, cleaner alternatives. This covers:

- all construction equipment and machinery,
- power generation units, and
- welfare and accommodation facilities for workers.



Lower Thames Crossing

Lower Thames Crossing to lead switch to hydrogen fuelled plant

Aaron Morby 8 months ago

Share   

National Highways has committed to pioneering the largest-ever use of low-carbon hydrogen construction plant on the planned Lower Thames Crossing mega project.



National Highways is aiming to buy the supply, storage and distribution of over 6 million kilograms of hydrogen to use on the project, which will replace around 20 million litres of diesel.

Construction Market Already Moving to Net Zero



Solar Lighting Towers (1.4kW)



Battery Storage (45kWh)



Battery / H₂ Powered Access
1kW FC

Our Purpose: Displacing Diesel

Off-Grid Generation Today



Off-Grid Generation Tomorrow



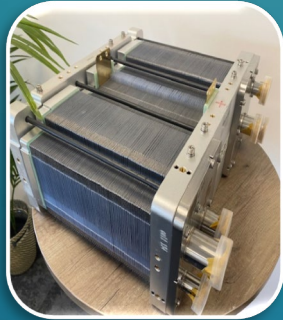
Zero CO₂ emissions from AFC Energy H-Power generators

What We Have Achieved in Three Years

Tech Acceleration | 2021-22



First S Series Air Cooled Stack



First S+ Series Liquid Cooled Stack



H-Power Towers Deployed - Unlock Market



State of the Art Ammonia Cracker Launched

Commercial Traction | 2022-23



Speedy Hydrogen Solutions



TAMGO Distribution Agreement - MENA

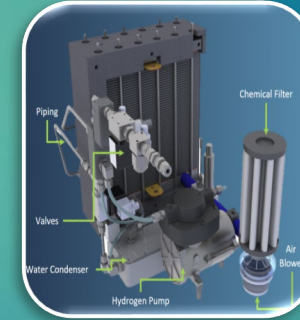


Acciona First H-Power Generator Order



ABB 200kW S+ Series Generator

Scaling Up | 2023+



Component Suppliers across 14,000 Parts / Generator



Scale Up of Pilot Production Facility



Hydrogen Production - Ammonia Cracker



Hydrogen Logistics Value Chain

H-Power Generator Platforms

Two fuel cell technologies deliver full range of generators from 10kW to 500kW

S Series



10kW

50kW

Air Cooled Fuel Cell Module

S+ Series



100kW

500kW

Liquid Cooled Fuel Cell Module

Two Fuel Cell Technologies – 6 Global Markets

Barriers to Entry



Focus on construction today enables:

- Rapid market penetration
- Reflects current industry “pain point”
- International market with immediate scale
- Scale brings down cost
- Reduces technology risk for future markets

Two Key Routes to Market – H-Power Generator



Equipment Hire

- Large equipment hire companies hold > 5,000 gensets
- Supports scale – drives down price
- Logistics and customer base to support deployment
- Model tried and tested globally

Dealership

- International distributors already in place
- Case Study: Caterpillar, world's largest generator manufacturer, for example, has 156 distributors worldwide*, including:



- Access to international market with on the ground support



AFC Energy's business model is to grow number of rental businesses customers in target markets:

- sale of generators
- replacement stacks (annuity)
- support in hydrogen sales
- spare parts and maintenance

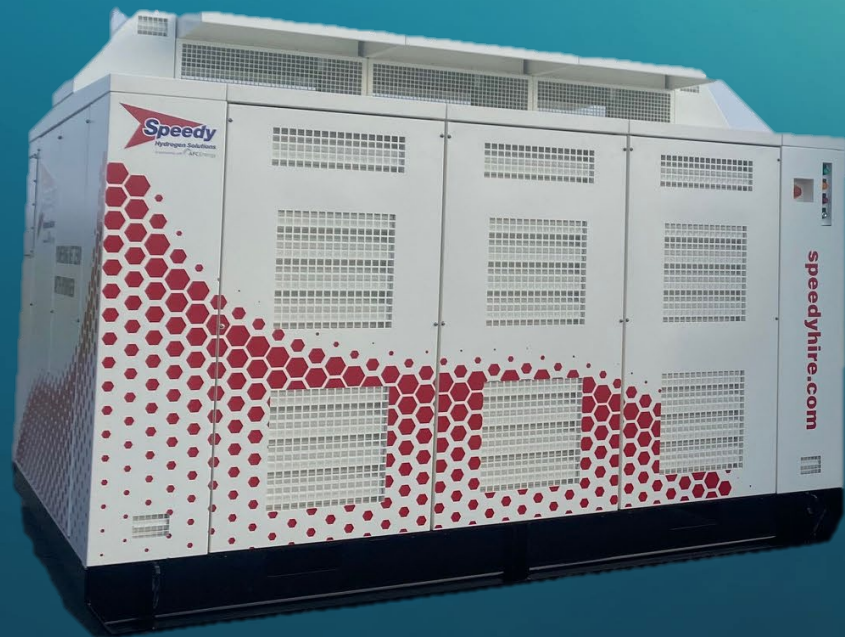
AFC Energy's business model is to grow number of dealers in target markets :

- sale of generators
- replacement stacks (annuity)
- spare parts
- support and maintenance

* <https://www.caterpillar.com/en/company/working-together/caterpillar-at-a-glance.html>

Speedy

Hydrogen Solutions



Speedy Hydrogen Solutions

Speedy Hydrogen Solutions a 50:50 Joint Venture between Speedy Hire and AFC Energy

Exclusive hire of AFC Energy H-Power Generators across UK and Ireland for initial 3 years

AFC Energy: Sells generators to the JV
Facilitates Hydrogen sales
Provides technical and regulatory support

Speedy Hire: Provides logistics and operational support
Brings blue chip customer base
Marketing and sales support

First H-Power Generator order valued at £2m with further £2.7m in 2024

Minimum order quantities will see order values increase across the three years

Strong customer interest with first generators expected to hit sites this month.



Speedy Hydrogen Solutions – Dan Evans CEO Speedy Hire

Zero emission power
for a new world

Speedy Hire



Speedy Hire at a glance FY23

Speedy Hire is the UK and Ireland's leading provider of tools, specialist equipment and services. We provide exceptional customer experience, accelerating collective success towards a sustainable future

Vision

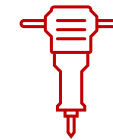
To inspire and innovate the future of hire and accelerate sustainable growth



£440.6m revenue
£103.7m EBITDA



c. 180 locations



£207.9m total net
book value of assets

Mission

To be the most efficient and sustainable hire business in the UK and Ireland: digital and data driven, optimised through operational excellence and powered by our people



Over 300,000
itemised assets



3,375 colleagues



52% of revenue
from ECO products

Values

Ambitious, Innovative, Inclusive, Safe, Together, and Trusted



Technology driven
business



4 star rating on
TrustPilot



c. 1,000 commercial
vehicles



***Velocity –
Our growth strategy***



Launching our Velocity Strategy

Launched at our Capital Markets day 11 July 2023 at our National Innovation Centre in Milton Keynes, our A+ Energy Performance Certificate (EPC) state of the art facility which is now carbon negative



Products

- Nifty product launch
- Green Power Hire acquisition
- AFC joint venture – Speedy Hydrogen Solutions



General

- Service centre and logistics network evolution
- Trade and retail proposition digital transition
- "Decade to Deliver" sustainability strategy launched



Transforming Speedy Hire

We are building a digital and data led business to step change our efficiency and power our growth.

We have mobilised a group-wide transformation programme to deliver the technical and operational changes required to establish our future platform.

Digitally and data driven...

*Our
network*

*Our
logistics*

*Our
assets*

... powered by our people and partners



Industry leading ESG

The Decade to Deliver - A Hire Revolution: Inspiring People to make Hire their First Choice

What we have achieved so far;

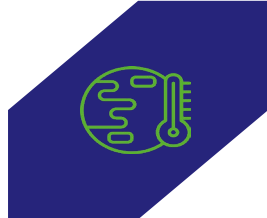
Accelerating Innovation

Continued investment in eco technologies to meet customer demand for Net Zero



Climate Solutions

First SBTi Net Zero by 2040 roadmap aligned to 1.5 °C in UK Hire



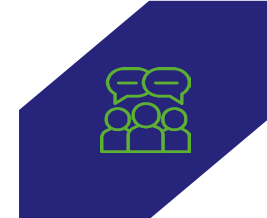
Including Everyone

Delivering on our People First strategy



Part of the Community

Delivering social value for our people and communities



Next steps;

Making hire even more sustainable through investment in eco technologies and refurbishing and retrofitting assets to become more circular

Net Zero and Nature Positive. 50% carbon reduction in Scope 1 and 2 by 2030 and Scope 3 by 42% by 2030 and Net Zero Carbon by 2040. Nature Positive by 2030

Top 100 employer – DEI, wellbeing, family friendly, talent, engagement, sustainable supply chains

Supporting Local - charities, community investment, volunteering, supporting local businesses (SME's) jobs – social value for people and communities



Nifty Hydrogen Boom Lift

Speedy Hire and NiftyLift Launch world-first hydrogen-electric powered access platform

Ground-breaking collaboration between two British companies brings a unique and sustainable solution to UK Construction

World's first hydrogen-electric powered, zero carbon access platform – with significant user advantages with less maintenance

Exclusively available through Speedy Hire from July 2023

£9m investment in sustainable powered access products, and the exclusive partnership aligns with Speedy Hire's Velocity strategy dedicated to sustainable growth and innovation

136 units being delivered over the next 12 months

Key features:

Zero-emission operation

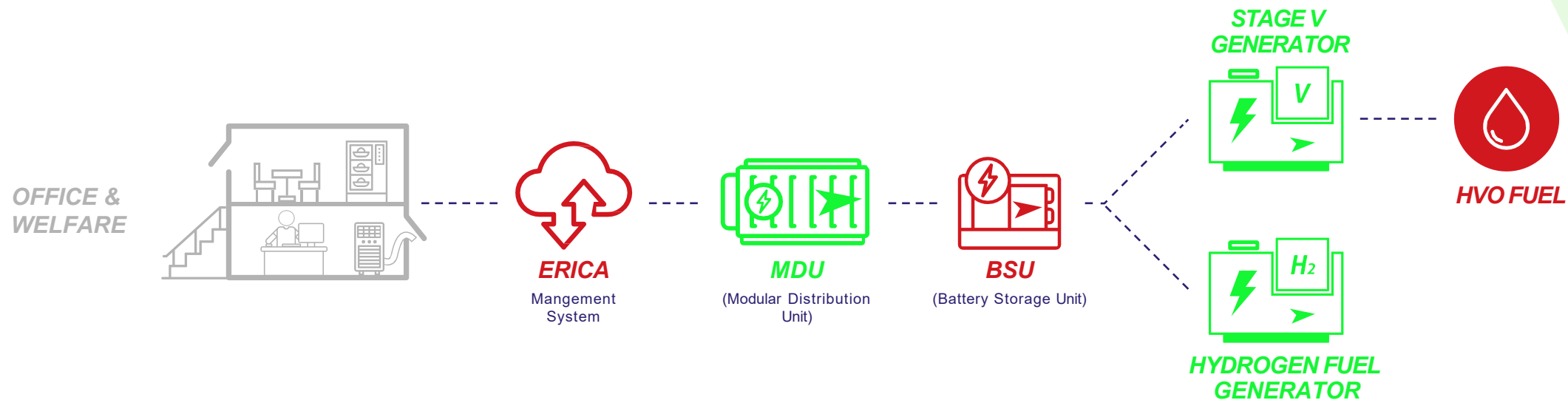
Significantly reduced lifetime costs

AGM maintenance - free batteries



Cleaner Energy Solutions

Combining the latest technologies Speedy Hire can provide your site with a greener power solution, reducing fuel usage on site, reducing emissions and improving air quality.



ERICA ENERGY MANAGEMENT SYSTEM

All of the information from this set up is then fed into Erica, a power monitoring solution that has been developed to support onsite power management by recording usage across multiple connections.

Recording power used, and storing this in the Cloud, an analysis can be carried out to identify:

- Where power may be wasted
- How to configure the site for lower usage
- Encourage good onsite discipline

BATTERY STORAGE UNIT HOME

A battery storage system works alongside your generator to create a hybrid power solution, storing any excess power produced.

The battery system automatically controls the generator, minimising run time whilst delivering a constant power supply to any application.

STAGE V GENERATOR

Speedy Hire can provide Stage V emission compliant power generation solutions that fully comply with NRMM legislation and are approved by the Energy Savings Trust. Our retrofit solutions ensure your site and operations are fully compliant within the most stringent NRMM ultra-low emission zone boundaries.

HYDROGEN FUEL CELL

Additionally, by using the battery storage unit in conjunction with a hydrogen fuel cell as an additional source of power, you can drastically reduce or even potentially eliminate the use of the generator on your site.

The electro- chemical reaction combining hydrogen with oxygen, is near-silent in use and only emission is water vapor, avoiding all the polluting emissions associated with petrol and diesel.

HVO FUEL

Fuelling your Stage V generator with HVO Fuel can provide a further reduction in emissions.

Speedy Hire's Green D + HVO improves air quality, by reducing CO₂e levels up to 90%, particulate matter levels by 88% and NOX by up to 30%.

Speedy Hydrogen Solutions

**Speedy Hire and AFC Energy Joint Venture:
The launch of a dedicated hydrogen-powered
generator hire business to deliver scalable,
modular zero emission power generators to the
UK and Ireland market.**

- Strengthens Speedy Hire's position in bringing sustainable innovations to market
- Clean energy and commercially sustainable solutions in high demand from customers
- Supports customers own net zero transition and sustainability strategies
- Compliments our traditional power generation business and our battery storage business acquisition
- A partner in AFC Energy, ready to continually innovate

"The pressure to deliver zero emission power on construction sites here in the UK and overseas has seen strong growth in demand for AFC Energy's H-Power Generators. Our collaboration with Speedy builds on the successful H-Power Tower launch last year and subsequent field-based deployments, many of whom are customers of Speedy."

**Adam Bond, Chief Executive,
AFC Energy**



Dan Evans
Chief Executive, Speedy Hire

"Our JV with AFC Energy further strengthens our market leadership in combining product innovation and sustainability solutions that are increasingly critical and in demand from our customers. We continue to make progress in the delivery of our ambitious plan to be a net zero business by 2040 and, together with other recently announced developments like the acquisition of Green Power Hire, provide strong and unique evidence of our Velocity strategy in action."



HYBRID POWER

WHY SHOULD YOU USE A HYBRID GENERATOR?

Carbon and emissions -

Significantly reduced CO₂ and NOx emissions, could equate to higher BREEAM scores

Fuel savings - Less fuel consumed compared to traditional generator sites

Silent operation - Reduces noise pollution, great for residential and restricted areas

Cost savings - Decreased number of service visits to site, hence less servicing and maintenance costs

HOW DOES A HYBRID GENERATOR WORK?

- A hybrid solution consists of a generator and a battery generator. The battery generator works in conjunction with the generator to manage site power loads.
- Throughout normal operating hours the generator powers the site's heavy loads, whilst also charging the battery generator.
- During night time or low power modes the battery generator will automatically power the site silently and carbon free.
- If the load goes above a predetermined parameter (or the battery generator needs charging) the generator will kick back in.
- The battery generator can also work alongside smart power distribution to reduce the size of your generator.



Customers & Projects



Lucy Stuart • 2nd

Head of Fleet & Logistics | Women in Cadent Co-Chair | M...
2w • 🌐

+ Follow ...

Really interesting visit yesterday to [AFC Energy](#) thank you for hosting and thank you [Tom Gillespie](#) and [Speedy Hire](#) for inviting us along.



Tom Gillespie • 2nd

National Account Director at Speedy Services
3w • 🌐

+ Follow

This morning we were delighted to host [Lucy Stuart](#) and Ian Dennis at [AFC Energy](#) to discuss hydrogen fuelling and power generation solutions for Cadent Gas.

Thank you again to [Adam Bond](#) for demonstrating and presenting on how net zero hydrogen solutions are ready and available to be deployed.

#speedyhire



Kirsty Chapman • 2nd

Major Account Manager
1mo • 🌐

Thank you to [Adam Bond](#), [Daniel Thompson](#) and the team at [AFC Energy](#) for hosting our valued customer, [SSE](#), this week. We are looking forward to seeing how [Speedy Hydrogen Solutions](#) c...see more



AFC Energy

12,706 followers
1mo • 🌐

Excellent day yesterday at the [Speedy Hire Live Expo 2024](#) with thousands attending Day 1 of the two day event.

...see more



Jack Evans • 2nd

Major Account Executive at Speedy Services
3mo • 🌐

Amazing day at [AFC Energy](#) with the team from [Balfour Beatty plc](#) today diving into hydrogen and battery storage power solutions. All part of our joint venture, [Speedy Hydrogen Solutions](#).

...see more



Jozsef Zoltan Terjek • 2nd

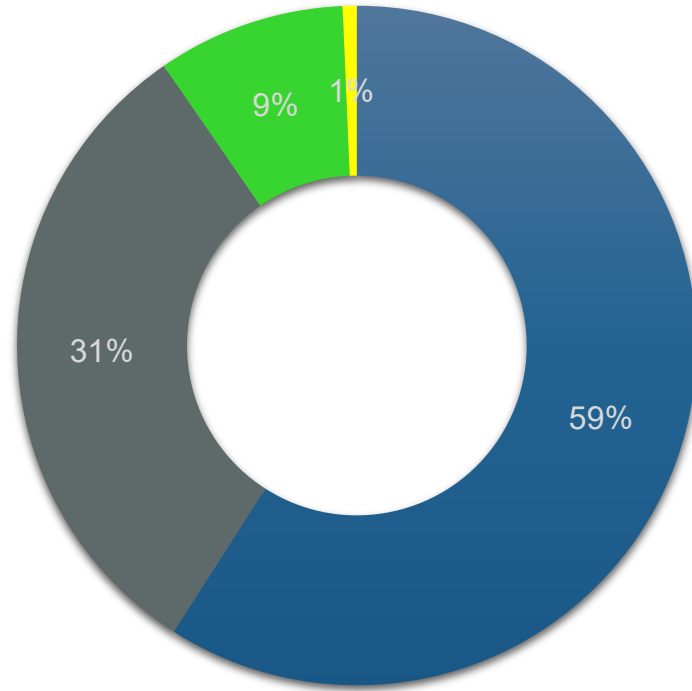
Energy Engineer at Balfour Beatty Asset and Technology Solutions | University of C...
4d • Edited • 🌐

🌟 What a week it's been! 🌟 On Wednesday, I had the pleasure of joining [AFC Energy](#) and [Speedy Hire](#), with the team, to dive into the latest advancements in fuel cells. We explored various topics, and gained valuable insights into ...see more



Market Size – UK Power

£443M
Total Market Value



■ Diesel Generators ■ Generator Accessories ■ Battery Storage Units ■ Hydrogen Solutions

Data source: AMA / Internal estimates
Pie chart representative to the nearest number



Summary



Outlook & Summary

- Speedy Hydrogen Solutions supports part of Speedy Hire's overall Velocity strategy and our growth plans
- Excited by growth opportunities and positive customer interest
- Offers choice to customers
- Commercially sustainable for our customers
- Delighted to be in partnership with Adam and the AFC Energy team





TAMGO Dealership

- One of Saudi Arabia's largest dealers of "best in class" industrial equipment
- Wholly owned by Zahid Group – one of the country's largest industrialist groups
- TAMGO represents FG Wilson, Doosan, Kubota and Ingersol Rand in the region
- TAMGO customers include Aramco, NEOM and other Saudi mega projects.
- Sample Market Size:
 - NEOM targeting displacement of >1GW of diesel generators by 2030
 - equivalent to 33,000 S Series 30kW generators

Target to deliver in-country manufacturing to support regional demand



The MENA Opportunity – Rami Elayan GM TAMGO

Zero emission power
for a new world

Sourcing Hydrogen

- Green Hydrogen
- Ammonia to Hydrogen
- Grey Hydrogen



- Half a trillion dollars in new hydrogen investment under development worldwide
- UK currently benefits from several strategic hydrogen supply alternatives
- AFC Energy investing to initial logistics capability:
 - Network of known industrial gas suppliers
 - 2 x refueller trailers purchased
 - Ammonia cracker
 - Compression and storage equipment
- No intention to become mainstream hydrogen logistics business

Fuel Cell Division

Zero emission power
for a new world

H-Power Overview

How H-Power Generators Work

Transforming into Product Company

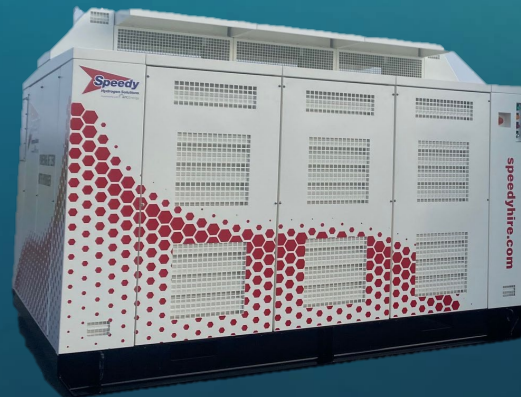
H-Power Product Lines

Unlocking Scale & Value

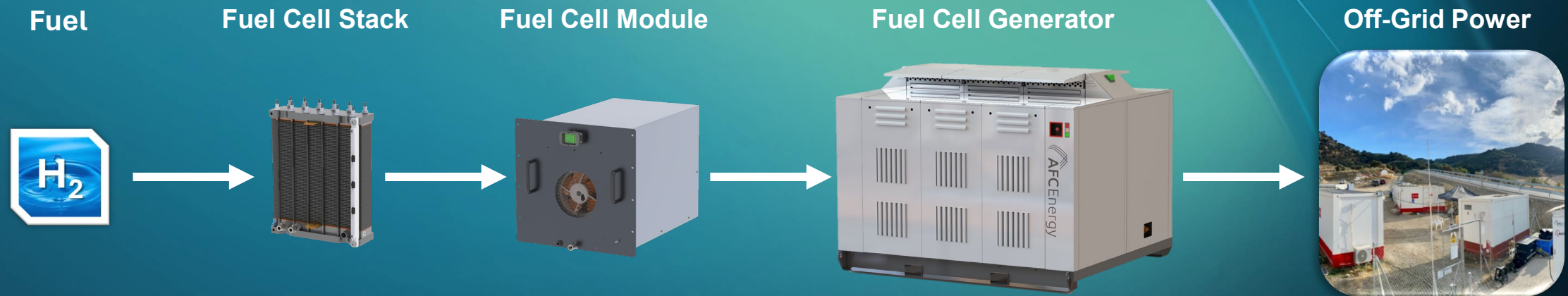
Manufacturing Strategy

Cost Reduction & Volume

Supply Chain & Diversification



How H-Power Generators Work



Clean & Quiet Power Generation using Hydrogen Fuel

Transforming into a Product Company

A strong focus on engineering and production

Engineering



Value

Production



Delivery

Quality



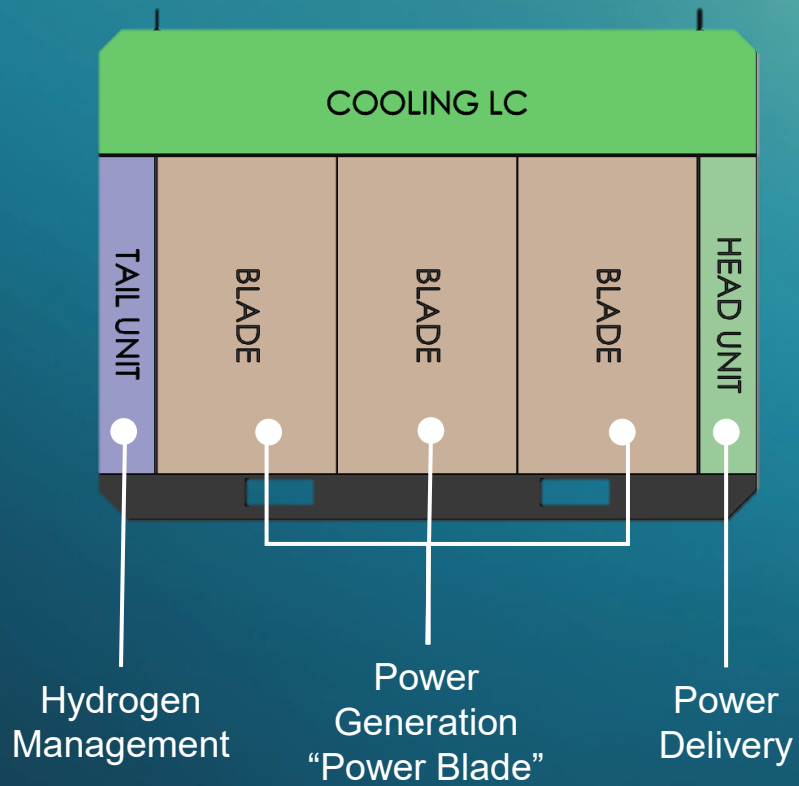
Reliability

Service



Experience

H-Power Product Lines – 1 Platform, 5 Product Lines*



S10

- 10 kW
- 1 Power Blade



S20

- 20 kW
- 2 Power Blades



S30

- 30 kW
- 3 Power Blades



Designed for Scaled Manufacturing

*S40, S50 not shown

Dual Path: Capital Efficient Manufacturing Strategy

“Light”
Production



Drive Quality Control

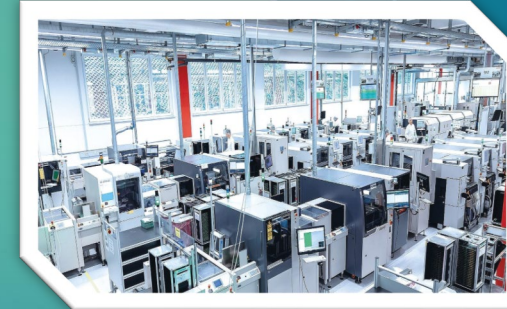
Technology Control

Supply Chain Ownership



Technology, Quality,
& Supplier Control

“Scaled”
Outsource Manufacturing



Scaled Process Control

Invested Infrastructure

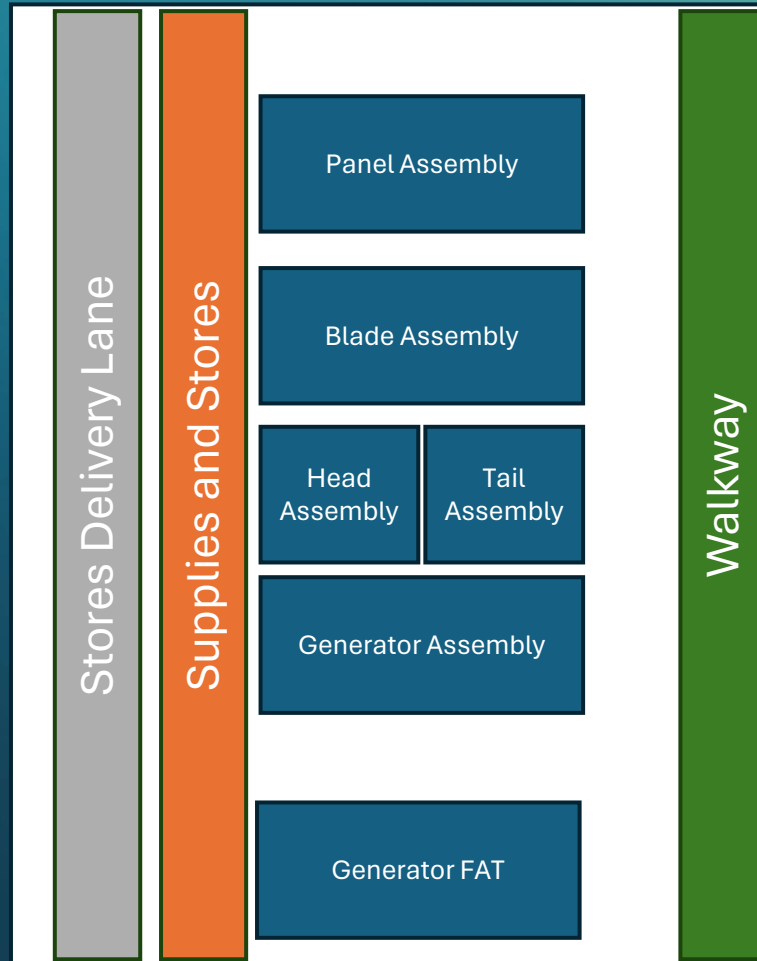
Speed to Scaled Production

Outsource
Manufacturing Partners

Process Control, Speed to Scale,
& Global Manufacturing

S Series Production – “Light” Production Line

Hangar S Series Production Area



AFC Energy plc. Capital Markets Day

May 8, 2024



Mr. Benedikt Eska

Founder and Managing Director, Axiosus Energy GmbH

Background and Experience



Benedikt Eska
Founder & Managing Director



Axiosus Energy GmbH

Franz-Ehrlich-Str. 12

12489 Berlin

Germany

www.axiosus.de

- Background in Physics
- Decades of experience in the H₂ and fuel cell sector
 - Former COO of Proton Motor
 - Former COO of Fuel Cell Powertrain
- Significant manufacturing scale-up experience across a wide range of technologies
 - COO roles in Hydrogen and Fuel Cell companies
 - CEO of a thermoelectric company (sold to tier 1 auto supplier)
 - Board member of a Swiss Battery Start-Up
- Demonstrated technical & manufacturing leadership
 - Part of the expert group for the first German National Innovation Program (German funding scheme) NIP I
 - Author of the "Planning Guideline for Fuel Cell Back-up Power Supplies".
 - Fuel Cell and Technology Due Diligence for various VC funds
 - Lecturer for Energy Technology at the University of Applied Science Munich (2011-2014)

Consulting

- Fuel Cell Production & Manufacturing
- Energy Management & Strategy
- New Technology Introduction
- Feasibility Studies & Cost Analysis

Project Development

- Concept Phase Planning
- Detailed Design Phase Management
- Deployment & Site Implementation
- Site Service & Maintenance
- Safety Analysis & Documentation

Product Development

- Product Management & Life Cycle Analysis
- System Integration Services
- Prototype Development and Verification

AXIOSUS provides consulting services to fuel cell & hydrogen businesses and their customers, including contract engineering and general contracting for fuel cell installations.

Independent Manufacturing Analysis

AFC Energy's Modular Generator Design

- Modularity provides more efficient scaling through commonization across 5 product lines
- Enables wider choice in outsource manufacturing partners

AFC Energy's Dual Path Manufacturing Approach

In-house Light Production

- Does not over-invest in equipment
- Light Production Scale Up sufficient to meet early demand

Scale-up Outsource Manufacturing

- Outsource manufacturing leverages industry capacity & expertise
- Axiosis connecting AFC Energy to its wide network of outsource manufacturers

Supply Chain Strategy



- **Supplier Qualification**

- Compliance with design requirements
- Qualification meet or exceed design requirements

- **Supplier Selection**

- Selection criteria
 - Component Performance vs design requirement
- Production Capacity
 - Capacity to deliver volume supply
- Cost & Cost Reduction Capability
 - Cost reduction with volume meet AFC Energy targets
- Component Quality & Consistency
 - Delivered component meet QA/QC performance

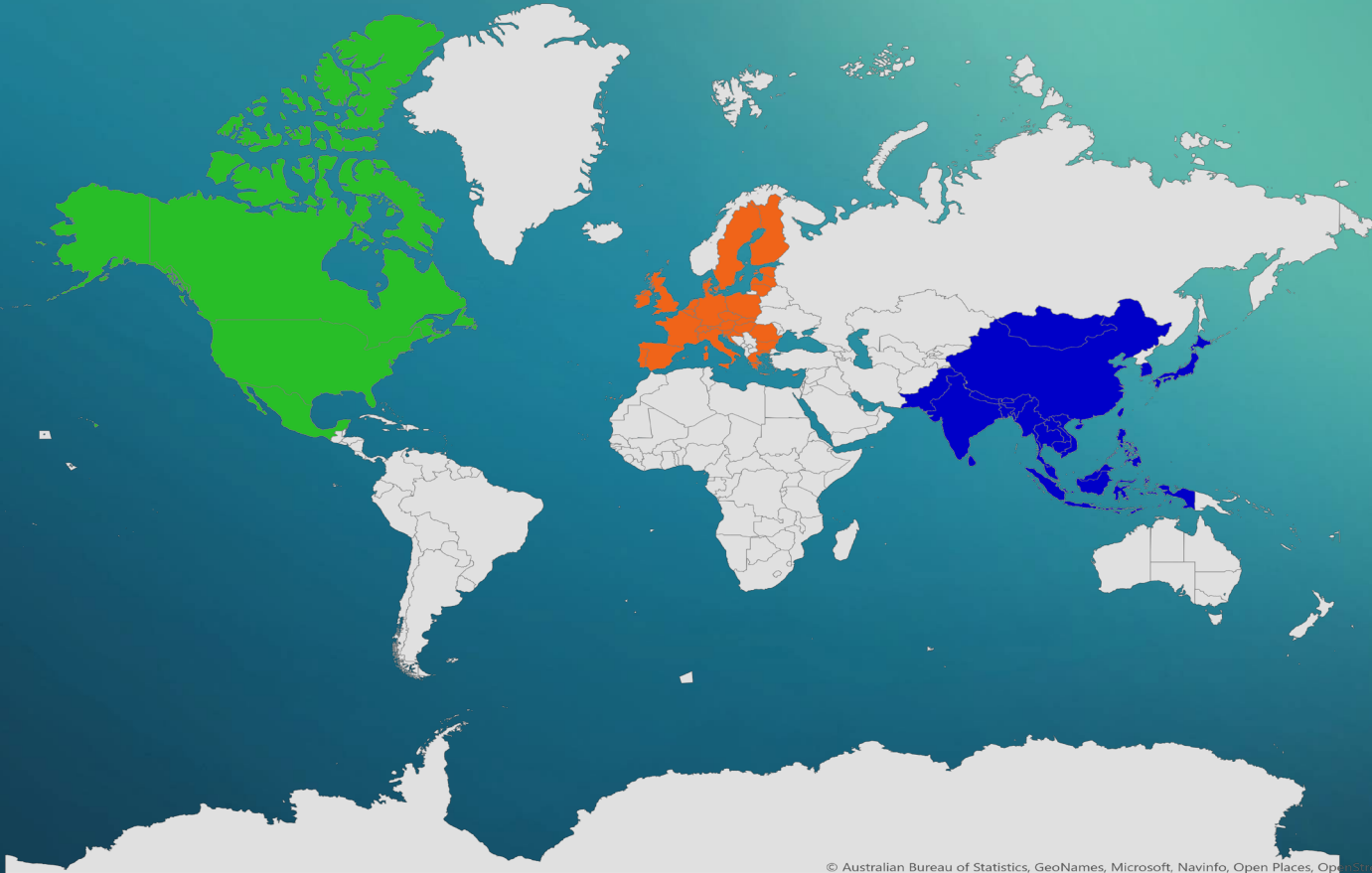
- **Supplier Award & Management**

- Supply reliability, up to 3 suppliers for key components
 - Tier 1 – Tier 3 rankings
 - Tier 1 – Primary Supplier,
 - Tier 2 – Secondary Supplier,
 - Tier 3 – Fallback Supplier
- Volume awards based on Tier Ranking

- **Supplier Diversification**

- Suppliers selected from key regions
 - Minimize geopolitical risk of supply disruption
 - Increases cost reduction potential
 - Alignment with regional expertise & capability

International Supply Chain



© Australian Bureau of Statistics, GeoNames, Microsoft, Navinfo, Open Places, OpenStreetMap, TomTom, Zorin

Supply Chain Diversification*

Fuel Cell Stack	Fuel Cell Module	H-Power Generator

Supplier Diversification

- Qualified multiple suppliers of key components across major world regions
- Progressing on Tiered Supply program to award volumes to up to 3 strategic suppliers per key component
- Tiered Supplier award based on supply cost reduction, quality, and capability to deliver volume

*Based on purchase orders placed for running production

AFC Energy plc. Capital Markets Day

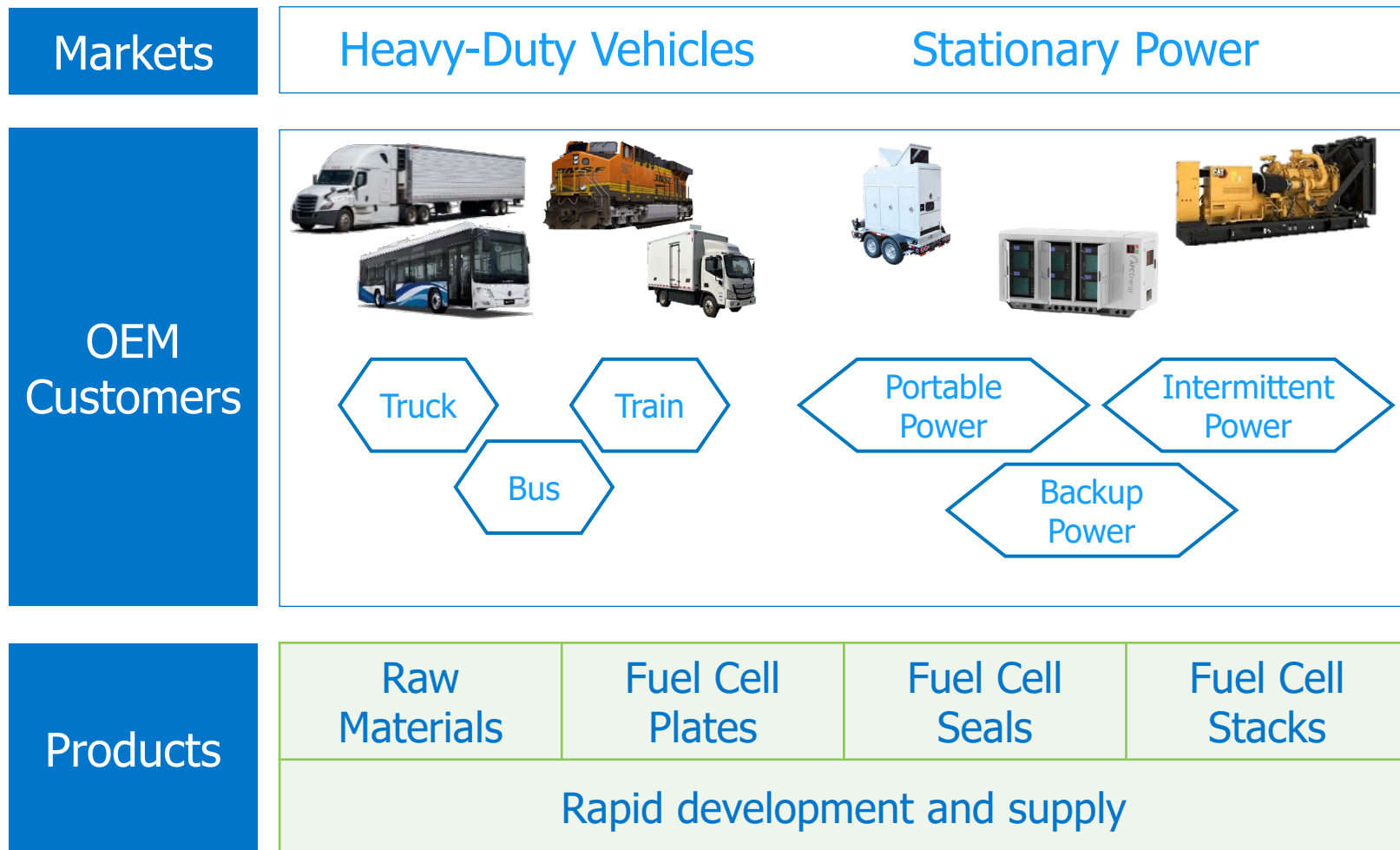
May 8, 2024



Jeff Plato
CEO, Illuming Power






- Illuming Power develops and manufactures fuel cell materials & components.
- Illuming Power and its Strategic Partners supply expanded graphite materials, bipolar plates, and fuel cell seals.
- Illuming Power materials and components are key enablers accelerating our customers' products to market.



- Illuming’s materials and manufacturing is based on our experience in the Vancouver fuel cell cluster, trade secrets, know-how and patent filings.
- The components deployed in over 4,000 powertrains have logged over 140 million km.
- Illuming’s network includes stack manufacturers with significant production capacity.

Technology

						
Proprietary materials and processes		Lower materials cost	Lower capital cost	Proven quality	High durability	Higher power density

Capacity

8,000/day Plate production capacity	3 - 500kW Component Fab. & Prototyping Capacity	5,000/year Stack production capacity
--	--	---



Jeff Plato | CEO & Founder

Directing Illuming Power’s vision and strategy

- 30+ years of experience in electronics, industrial and fuel cell equipment business in Europe, North America and Asia.



Simon Farrington | CTO & Founder

Leading our technology development and engineering

- 25+ years of experience as a fuel cell designer
- Expert in fuel cell stack and component design



Himanshu Kamboj, CPA, CA | CFO

Leads financial strategy

- 15+ years of experience in finance
- Experienced CFO of Canadian clean technology companies

Technical Team

World class experience

- 15+ decades of combined experience in fuel cell design, development, manufacturing processes and scale-up

Opportunity and Delivery

AFC Energy S-Series Generator Products:

- AFC Energy is one Illuming Power's fastest scaling customers
- AFC Energy's Hydrogen Power generator components represent a significant opportunity comparable to mobility applications

Illuming Power is providing supply, quality, capacity, and manufacturing support:

- Plate and seal production capacity (10,000's per week)
- Unlocks a network of stack manufacturers with assembly capacity (100's per week)
- Partnership to jointly validate stack manufacturing partners
- Contribute to AFC Energy's "Light" production to drive quality and early volumes in stack manufacturing

Capacity to deliver AFC Energy's H-Power Generators production demand for fuel cell plates.

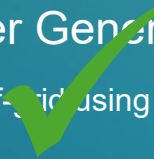
Unlocks contract stack manufacturing with our global network of stack manufacturers.



H-Power - Ready for Scale

How H-Power Generators Work

Powering off-grid using Hydrogen



Transforming into Product Company

Driving delivery, quality, and value



H-Power Product Lines

Moving from Technology to Products



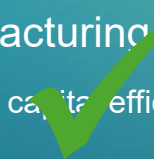
Unlocking Scale & Value

Design for scale and contract manufacture



Manufacturing Strategy

Dual path, capital efficient scale-up



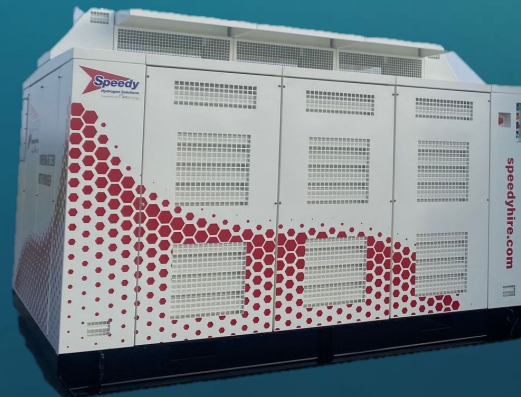
Cost Reduction & Volume

Successes and Opportunities through volume



Supply Chain & Diversification

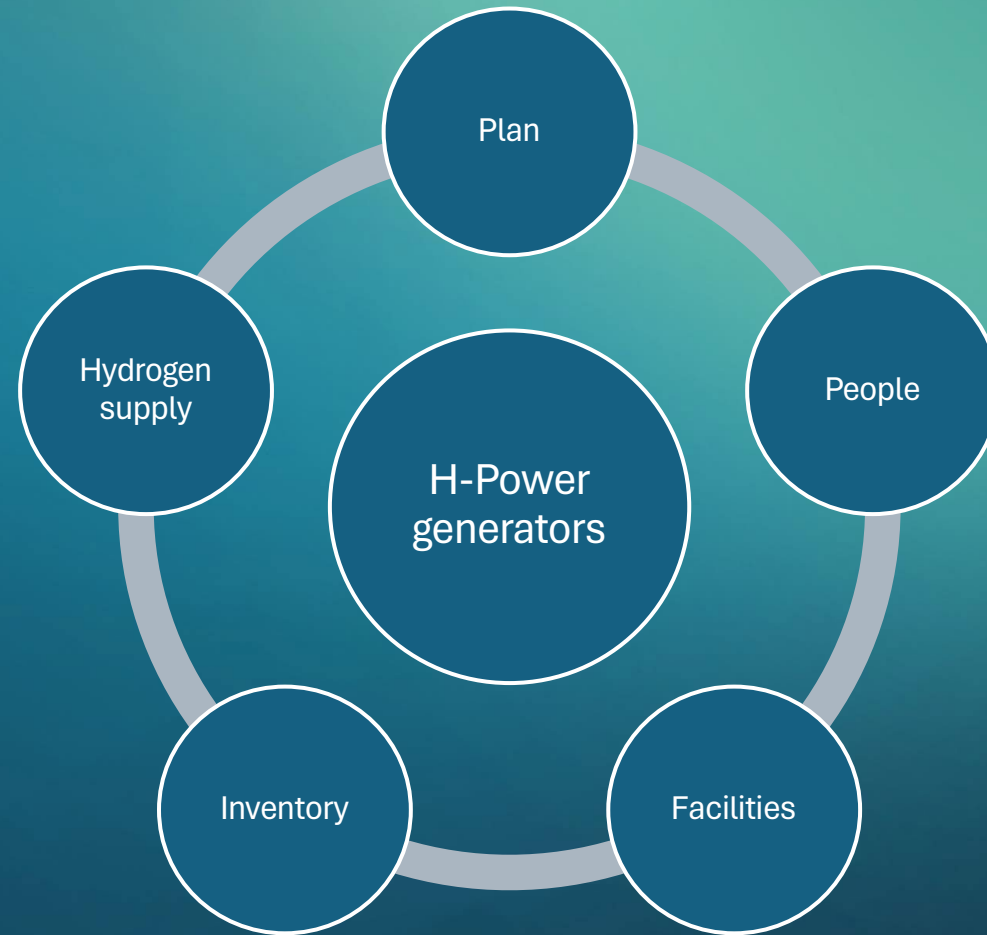
Supply chain readiness and capability



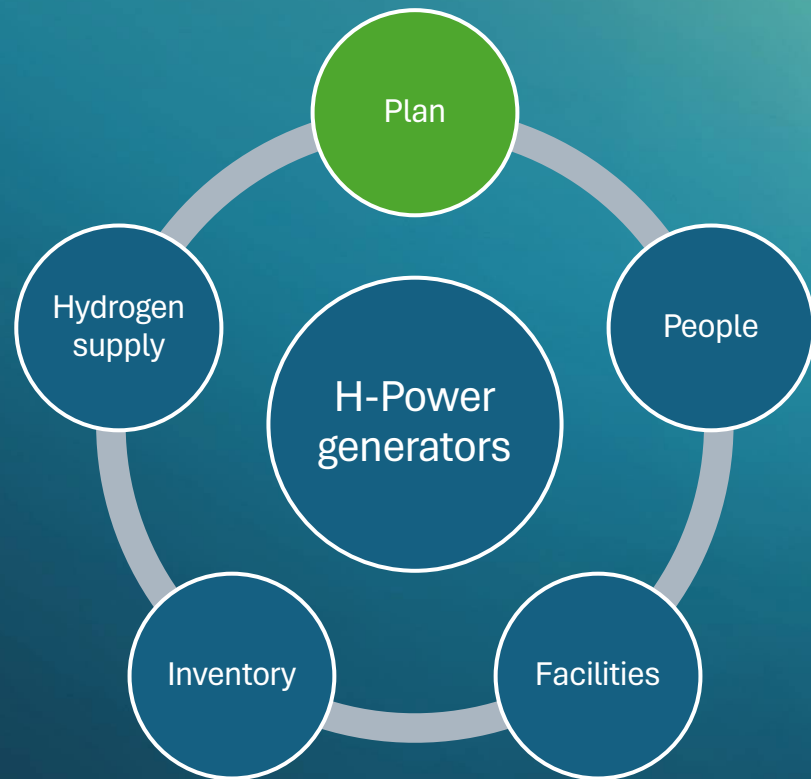
Organisational readiness: from Order to Delivery

Zero emission power
for a new world

From Order to Delivery



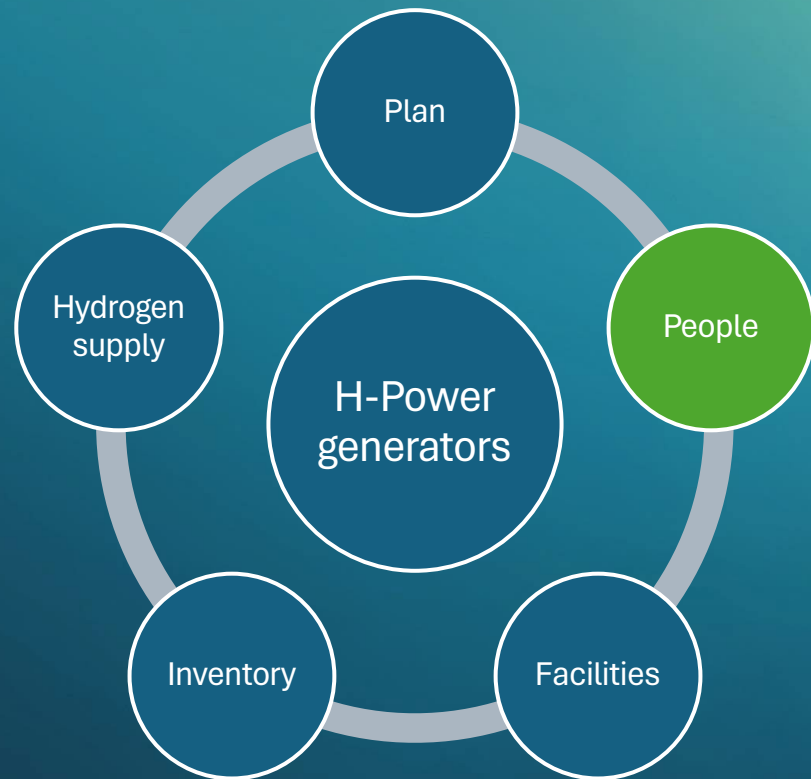
From Order to Delivery



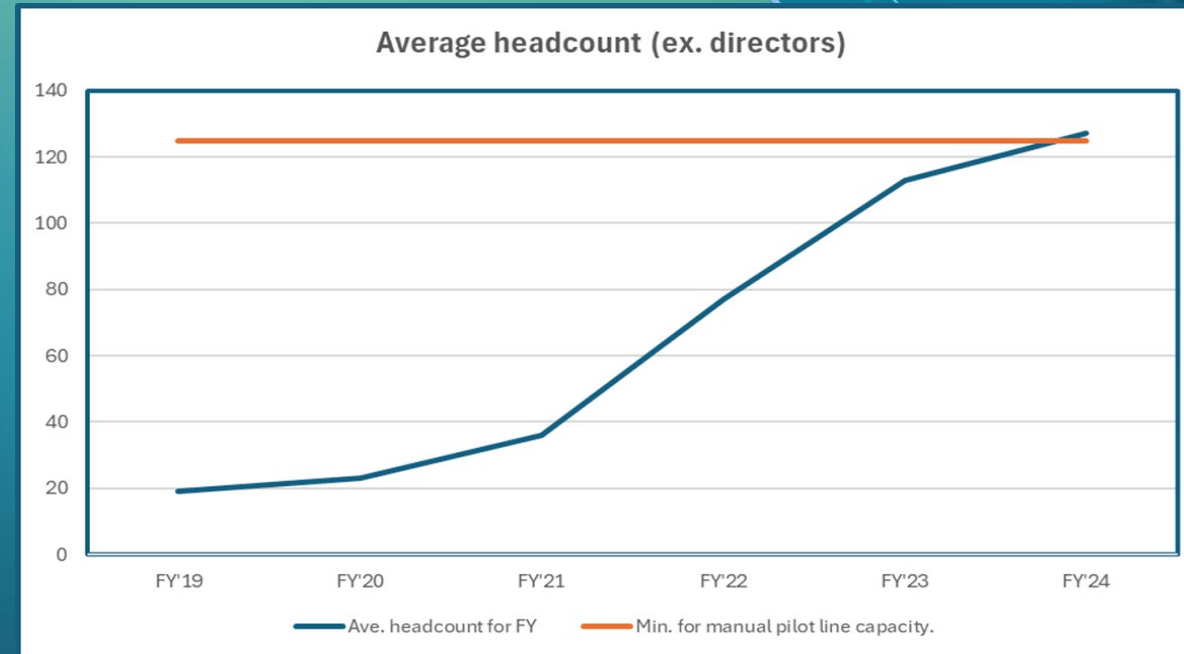
The Plan

- The plan is to deliver ~200 generators in FY26 by rolling out a baseline capability in FY24, i.e., now.
- The baseline capability needs to:
 - Establish a manual pilot line to assemble the key sub-components
 - Be based at Dunsfold on the existing facilities
 - Provide a rapid feedback loop to engineering; and
 - Protect the brand through strong quality assurance

From Order to Delivery

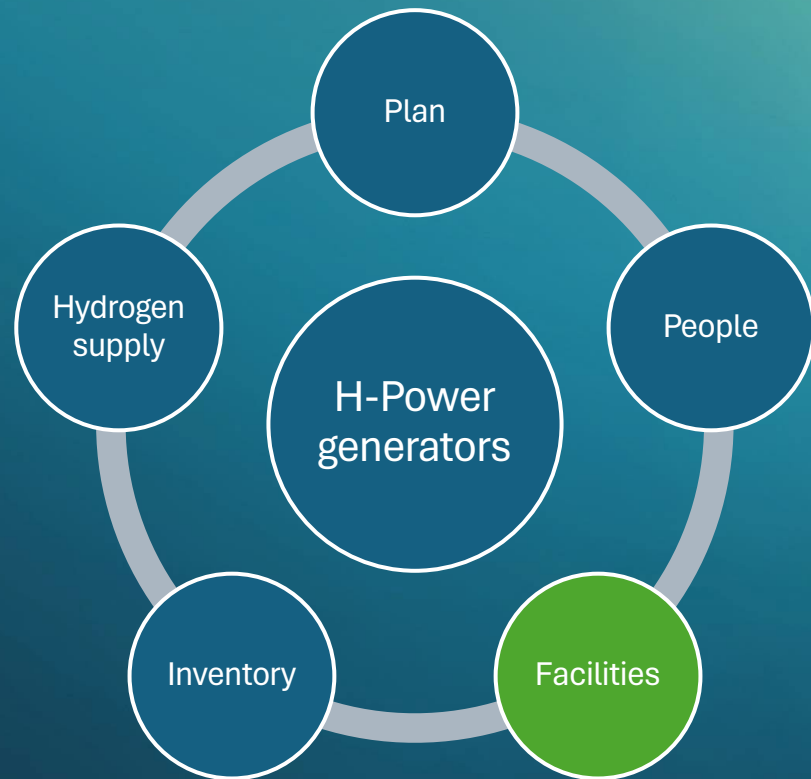


The People



- Growth phase to baseline capability now complete
- All the key functions are in place
- Search initiated for Chief Operating Officer (Manufacturing Focus)

From Order to Delivery

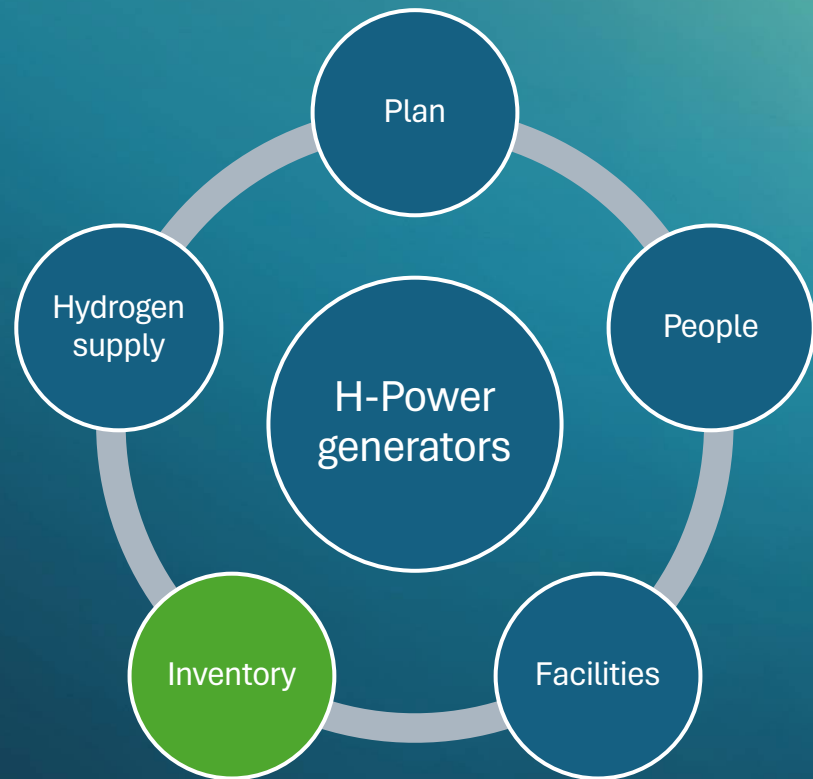


The Facilities

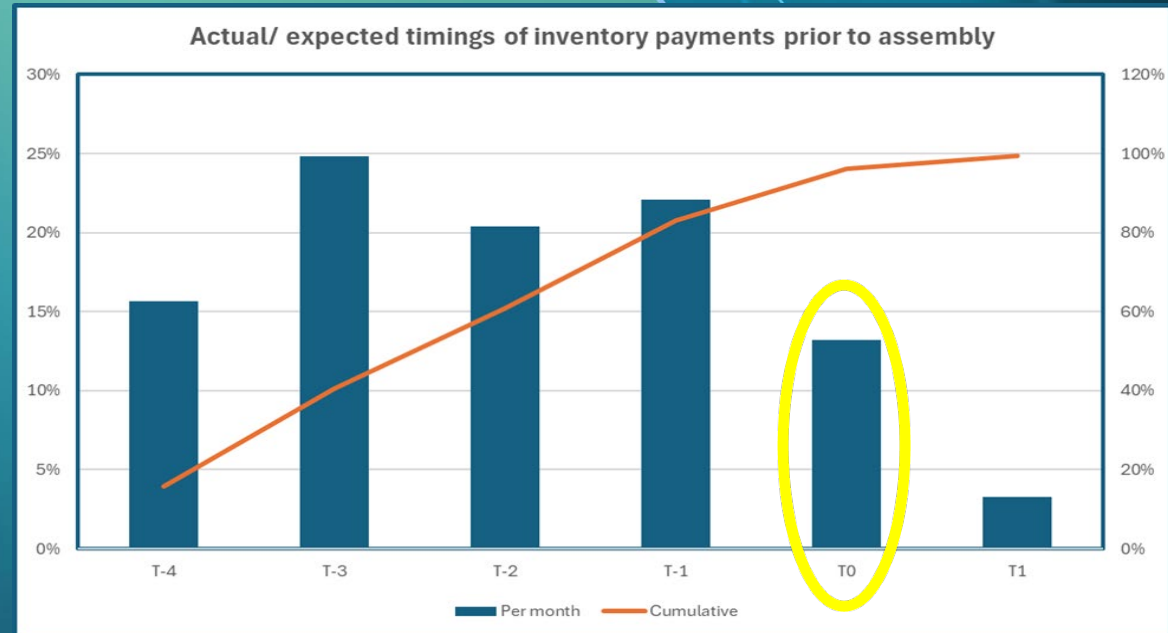


- Investment in the current facility completed last year
- Big enough footprint to house entire organisation for baseline output with room to grow

From Order to Delivery

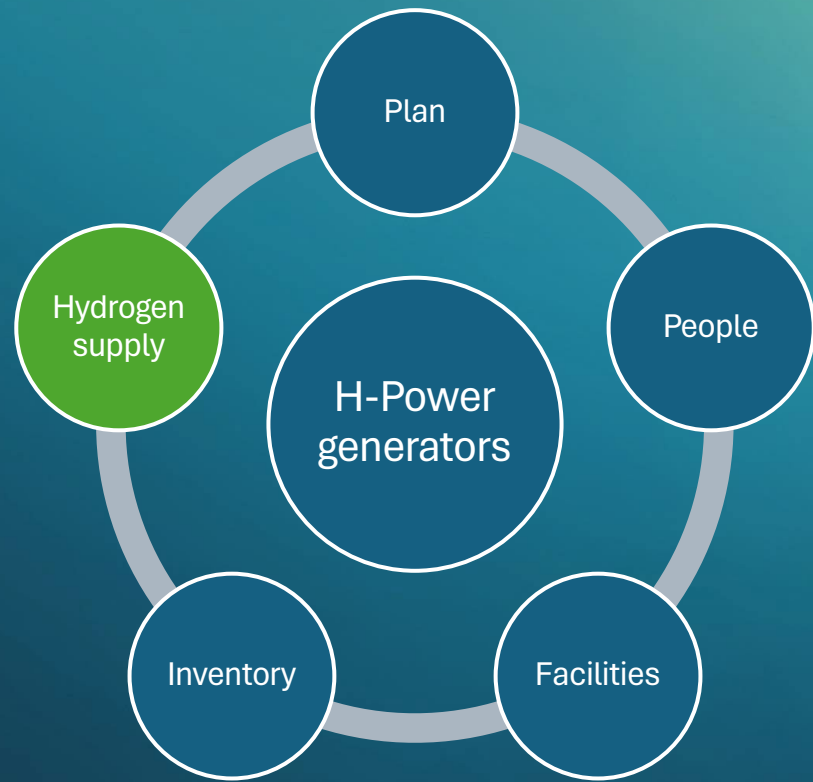


Inventory



- Supply chain is predominantly international with well established companies
- Nature of supply chain means that ~80% of inventory costs are paid for by the start of assembly (T0)
- Terms will improve as a function of time and scale

From Order to Delivery



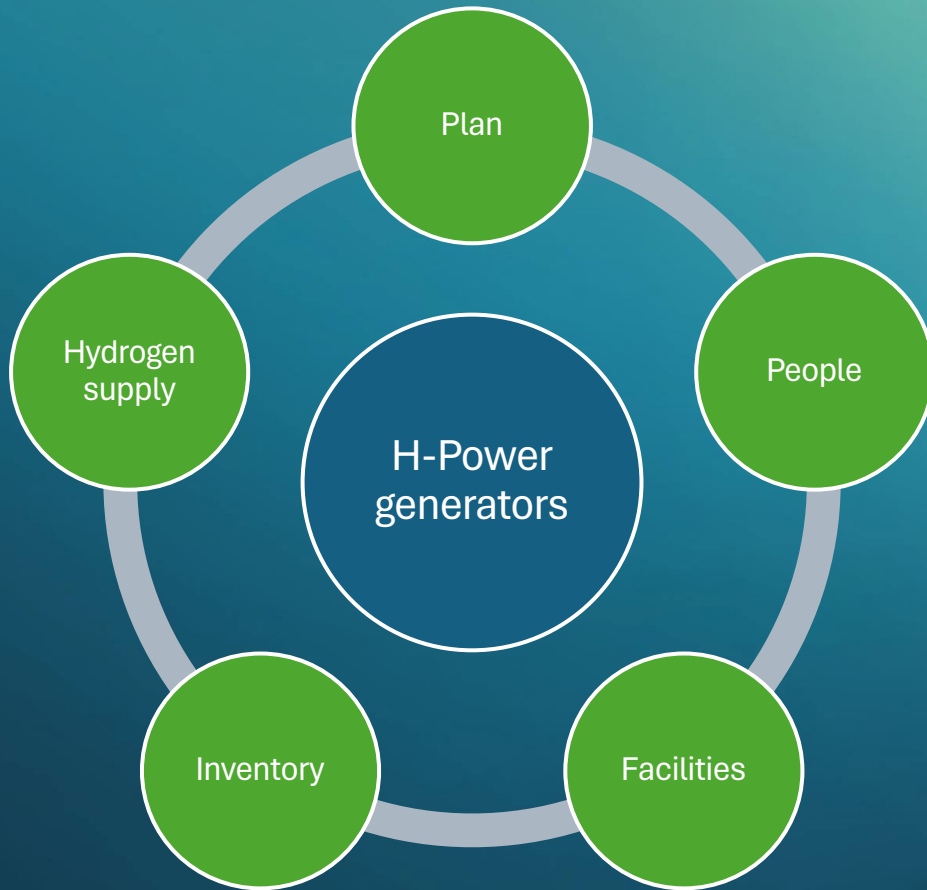
Hydrogen Supply



1 MCP
= 9kg of hydrogen
= ~1 day of operation

- Embedded knowledge around procurement, storage and delivery of hydrogen
- MCPs are readily available and used for the Power Tower deployments.
- AFC Energy procured the hydrogen for Extreme-E and for most of the Power Tower customers

Summary

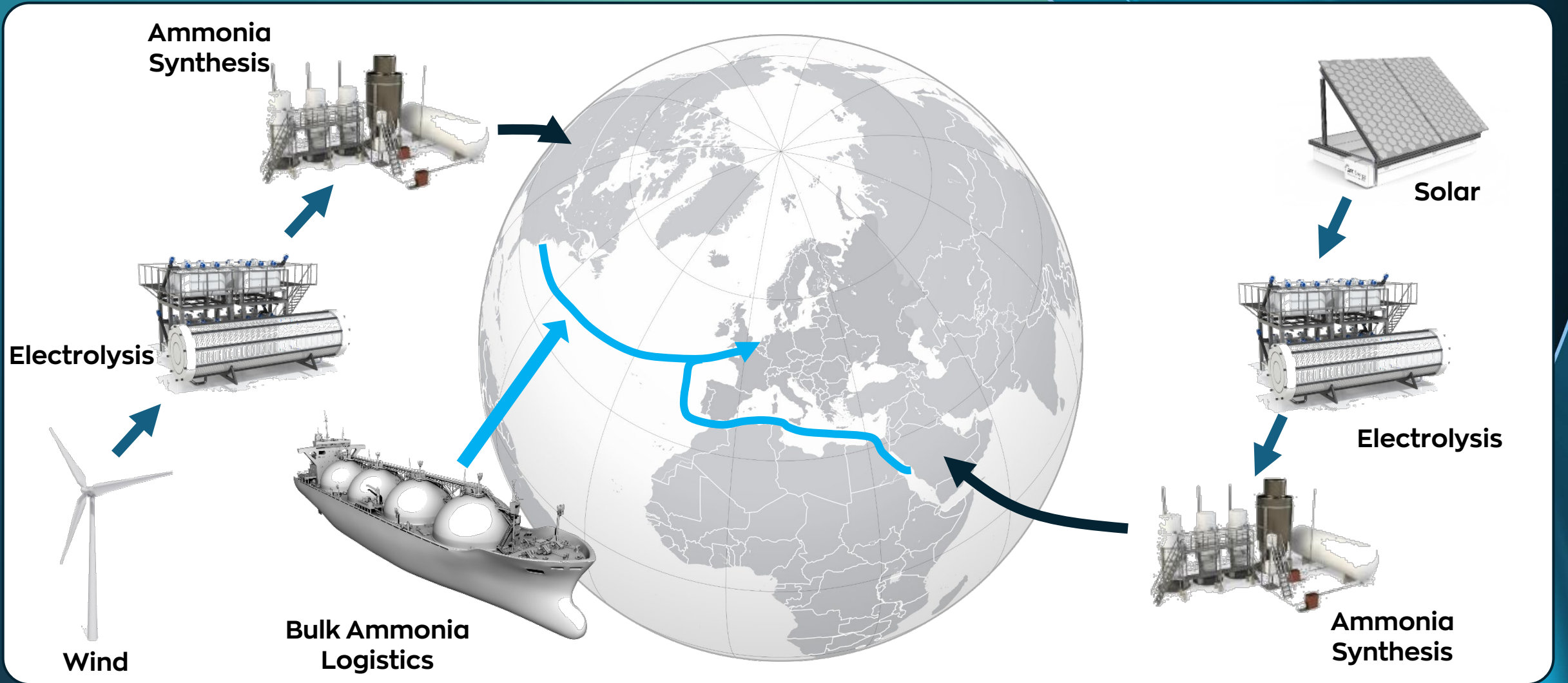


- Plan In place
- People In place
- Facilities In place
- Inventory Build-up started
- Hydrogen supply In place

Ammonia Cracking: The Billion Pound Opportunity



Ammonia as a Hydrogen Carrier



Global Ammonia Terminals



argusmedia.com

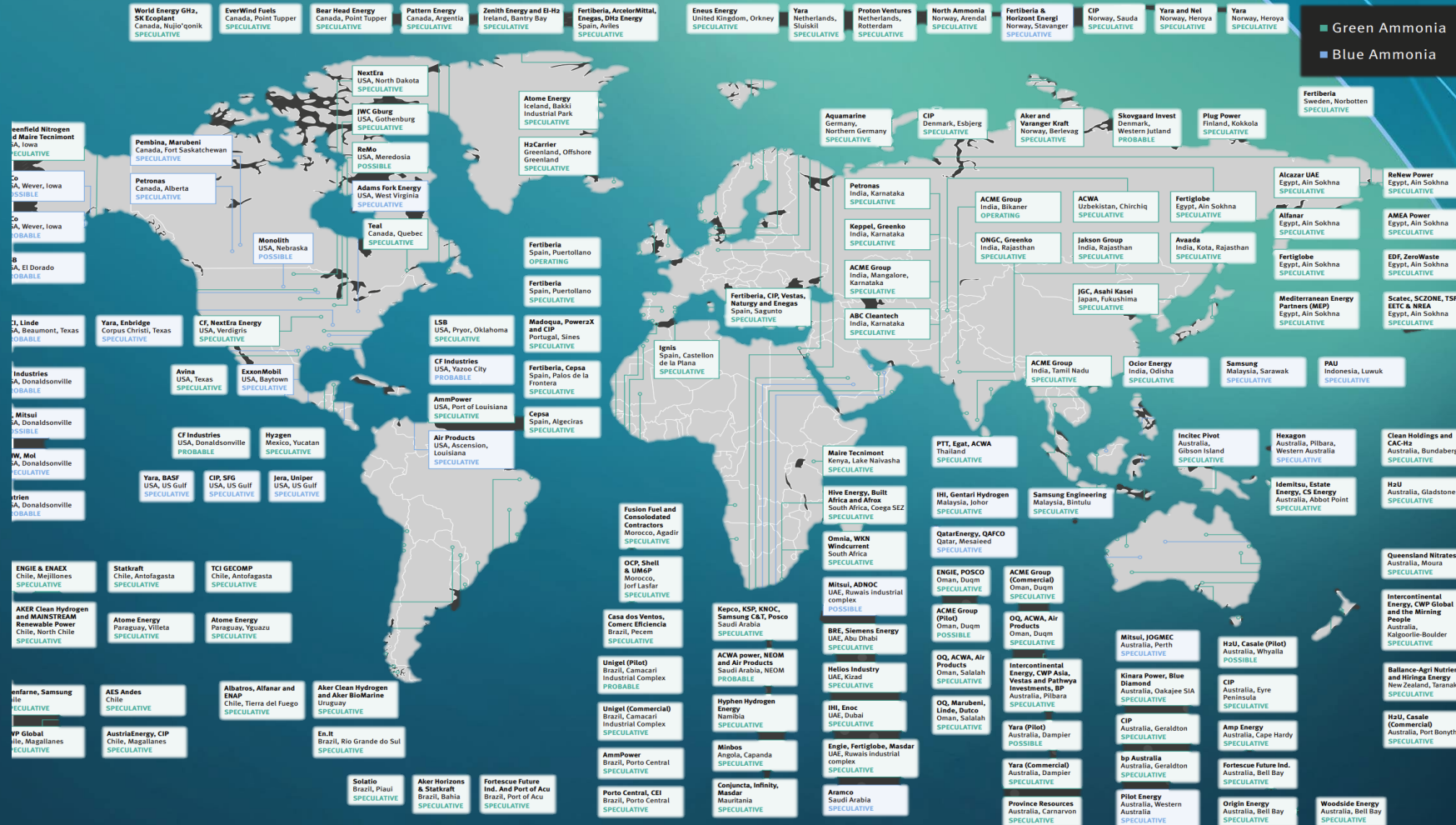
Ammonia terminals - a global view

Ammonia terminal locations and capacity ('000 t)



Source: <https://futurefuels.imo.org/wp-content/uploads/2024/03/WorldAmmoniaMap2024.pdf>

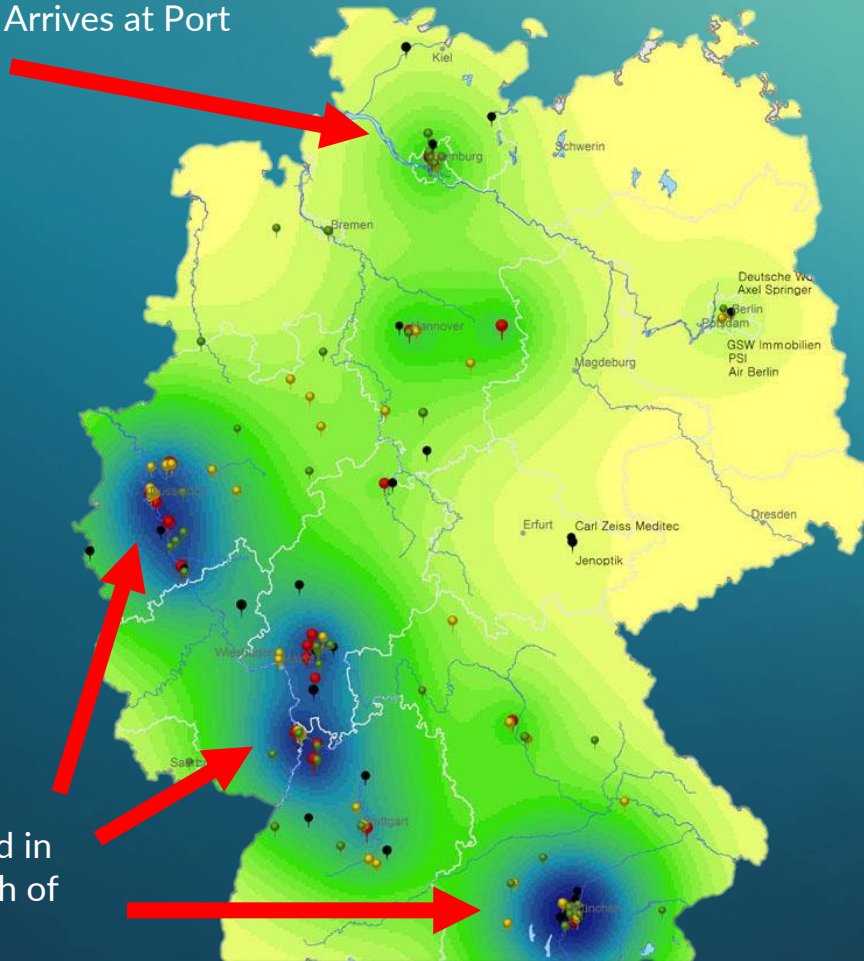
Global Footprint of Planned Clean Ammonia Production



Source: <https://view.argusmedia.com/rs/584-BUW-606/images/FER-Argus%20Clean%20Ammonia%20Projects%20Tracker%20Map%20-%2020July%202023.pdf>

Ammonia Arrives at Port ... but where's the Demand

Ammonia Arrives at Port



Industrial Demand in the Mid and South of Germany

Ammonia is transported by sea to port:

- Ammonia cracking (petrochem scale) at port
- Requires pipeline to transport hydrogen to industrial hubs
- Pipeline will accommodate highest grade H_2 – whereas large industrial demand may look to combust lower grade (cheaper) H_2
- Hydrogen Backbone proposed across Europe – years away

Value in modular, scalable distributed ammonia cracker

Cracker Technologies

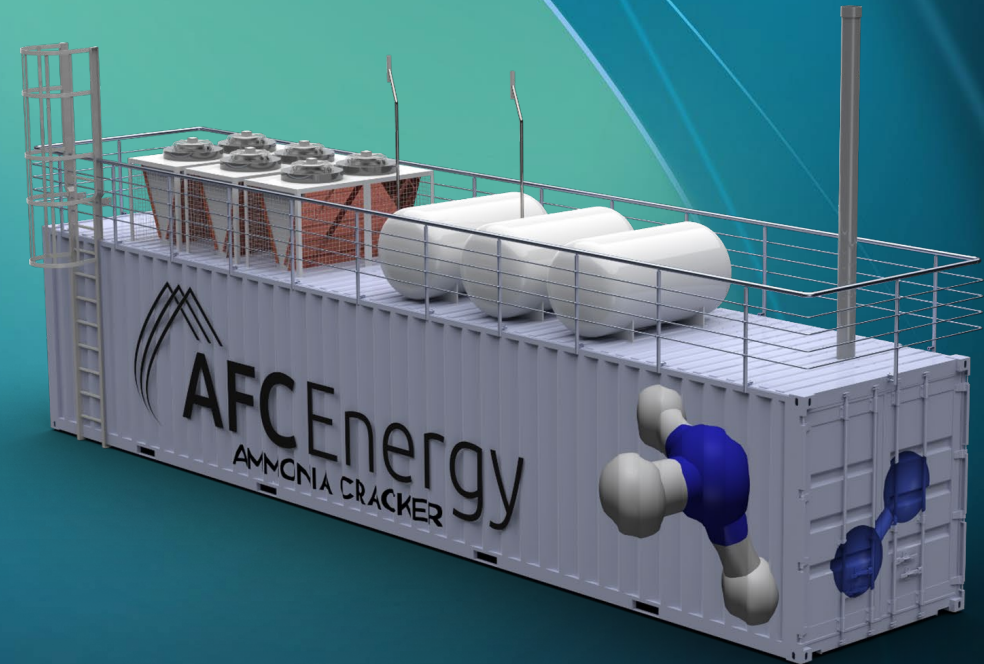


Ethylene Cracker



Naptha Cracker

Vs.



AFC Energy Modular Ammonia

Ammonia Cracker Technical Progress

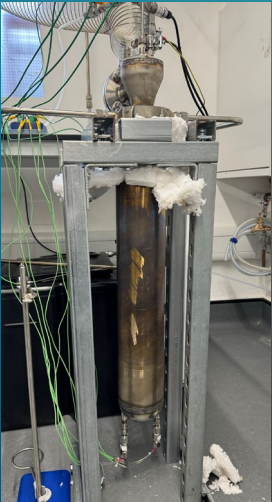
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Cracker Technology Completed Milestones

September
2022



February
2023



July
2023



AFC Energy Sets New Standard from Ammonia-to-Hydrogen Process

NATIONAL PHYSICAL LABORATORY
INDUSTRIAL GAS CONSULTANTS

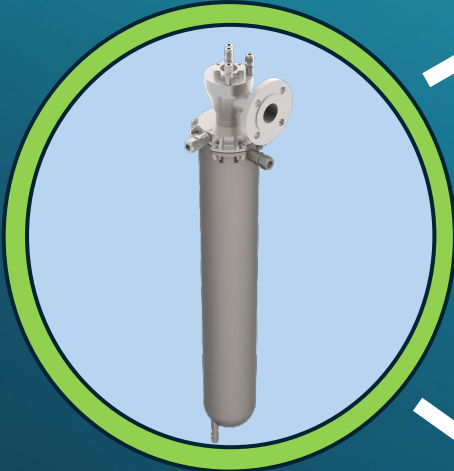
Test Report

Parameter	Value	Units	Standard
Ammonia	99.999	wt%	ASTM A1065
Water	0.001	wt%	ASTM A1065
Hydrogen	0.000	wt%	ASTM A1065
Other	0.000	wt%	ASTM A1065

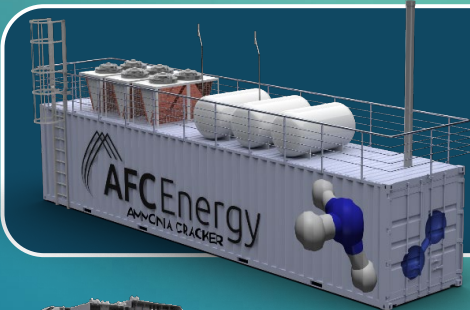
October
2023



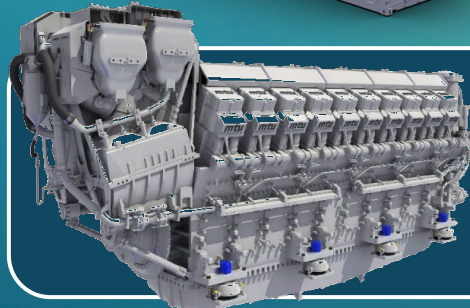
Cracker Markets – 2024 Focus



AFC Energy
Core Cracker
Architecture



Modular Purified Hydrogen
Generation for Transport & Power

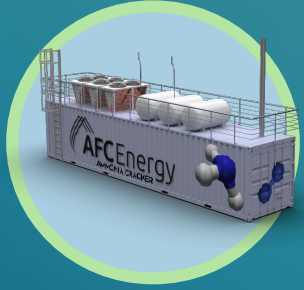


Pilot Fuel generation for Combustion
Engines



Hydrogen Rich Combustible Fuel
Gas for Industrial Applications

Potential Markets for an Ammonia Cracker



Pure Hydrogen Generation



Rail



Truck stops



Tube Trailers



Construction



Engine Crackers



Grid Support



Maritime



Mining



Excavation



Combustion Gas



Asphalt



Grain Drying



Steel



Steam Generation

Industrial Chemicals

Steven Swaby – Finance Director
Darren Sharpe – Energy Projects Manager



About Industrial Chemicals

- We are a UK Chemical Manufacturer and distributor
- 6 Manufacturing sites
- 470 Employees
- £200 Million turnover
- Operator of 75 HGV vehicles with 150 specialised chemical tankers
- Main supplier to all UK water utility companies

On-Site Hydrogen Production from Ammonia

- We could operate our steam boilers with on demand Cracked Hydrogen
- We could produce Hydrogen for future Hydrogen operated HGV vehicles
- We could Utilise Cracked Hydrogen for electricity generation with fuel cells
- This would enable ICL to have complete control of Hydrogen produced from Cracked Ammonia without the need for importation under take or pay contracts from Hydrogen pipeline operators

Off Site Hydrogen Production from Ammonia

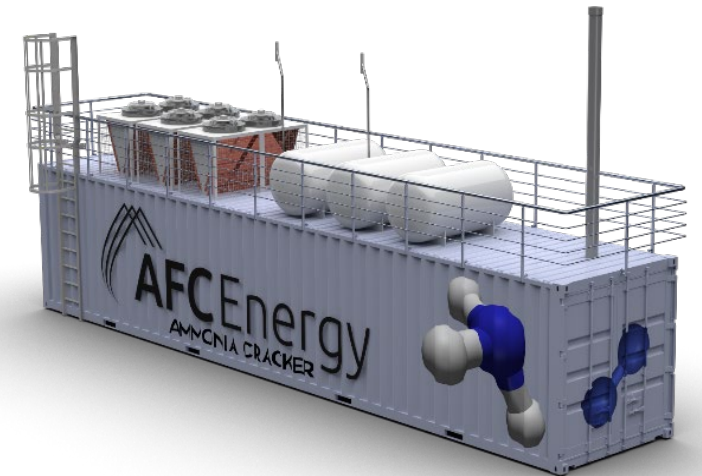
With ICL having their own imported Ammonia it also creates a new business opportunity for the company by:

- Supplying Ammonia to customer sites for use with a local cracker to produce hydrogen.
- Supplying Hydrogen direct to customers that has been produced from Cracked Ammonia
- Store Ammonia in strategic locations for contracted on demand Cracked Hydrogen supply into Hydrogen pipeline networks

Ammonia To Cracked Hydrogen Business

ICL clearly see the opportunity around the Hydrogen market for both their own use and for the supply of Ammonia and Hydrogen to others:

- The AFC Energy Ammonia Cracker is central to utilising Hydrogen at our manufacturing sites and developing the customer market for ICL
- The cracker design is excellent for small and large Hydrogen plants and especially for customer commercial properties where space is normally at a premium
- Store Ammonia in strategic locations for contracted on demand Cracked Hydrogen supply into Hydrogen pipeline networks



Industrial Chemicals

Thank you

Steven Swaby – Finance Director
Darren Sharpe – Energy Projects manager



Outlook

Zero emission power
for a new world

Outlook

- **2024's focus is on delivery!**
- We have put in place the foundation to facilitate:
 - routes to market with Tier 1 partners
 - H-Power Generator deployments to the field from this month
 - technology validation through satisfactory factory acceptance tests
 - links to international component and manufacturing partners
 - growth in production capacity both internal and external to support growth
- Addressable markets offer rapid access through policy and regulation with sizeable growth potential
- Blue sky value from ammonia cracking which the Board believes is not reflected in today's share price



THANK YOU