HyWaves

Local Green Hydrogen

Problem

Today H_2 is almost exclusively produced from fossil fuels

Producing 2% of the world's CO_2 emissions

Low cost $1-2 /kg

Green H_2

(H_2 produced using renewables):

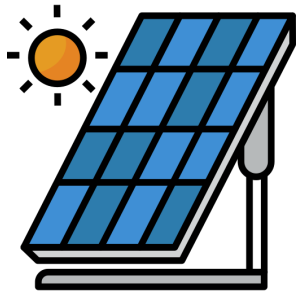
High production costs $3-8 /kg

Costly to transport

Problem

- To drive down the costs of H_2 R&D has focused on storage, electrolysers & fuel cells…
- …leaving breakthroughs in systems design & electronics underdeveloped. **HyWaves** captures this market.
- By 2030 the price of H_2 will be reduced by 1/3, but with our solution it'll be reduced by 1/2

Problem – complex & expensive architecture

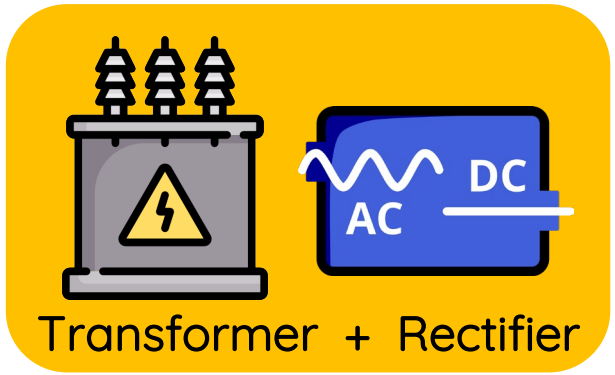


Renewable Energy

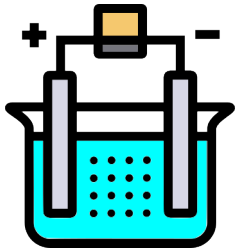
3% Loss

PV Inverter converts DC to AC

3% Loss

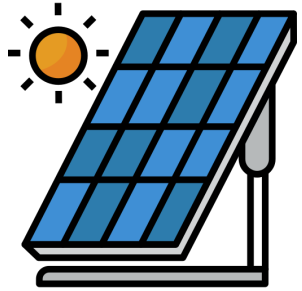


Power Supply converts AC to DC



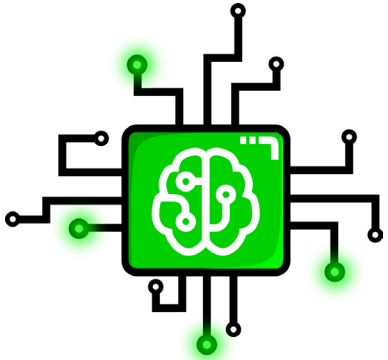
Electrolyser

Solution

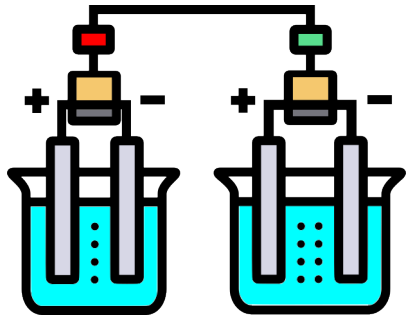


Renewable Energy

0.5% Loss



HyWaves DC-DC adaptor & electrolyser control



HyWaves Electrolyser Enhancer

- **HyWaves** solution enhances electrolyser output & simplifies the electronics
- Removes expensive power electronics
- Eliminates DC-AC-DC conversion losses

Savings

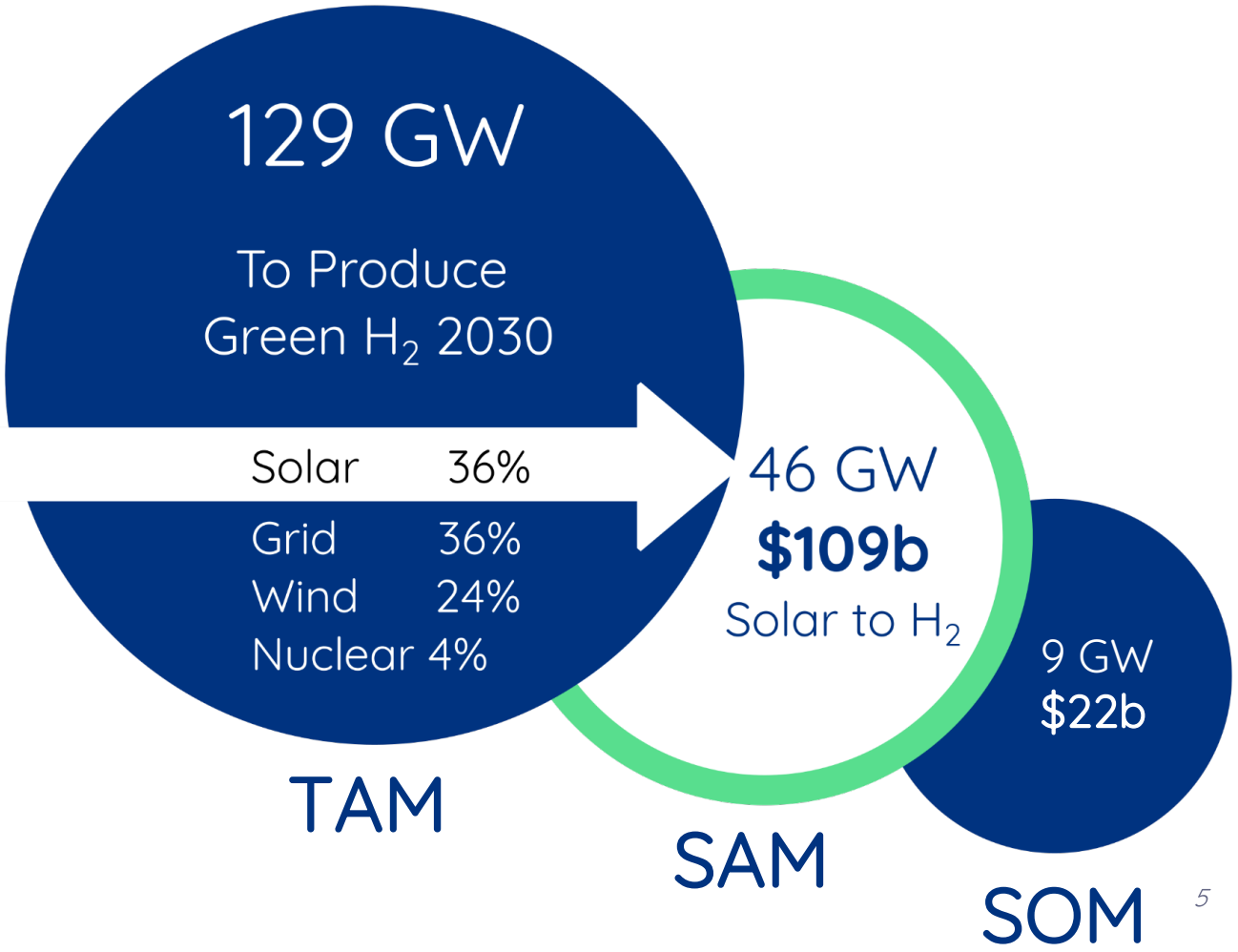
HyWaves can drive down the Levelized cost of H_2 (LCOH) for solar to hydrogen plants by **19%**

- 6% by removing the solar inverter CAPEX
- 8% by simplifying the electronics to manage the electrolyser
- 5% by the increased hydrogen production from the electrolyser being DC to DC direct coupling

Market Size by 2030

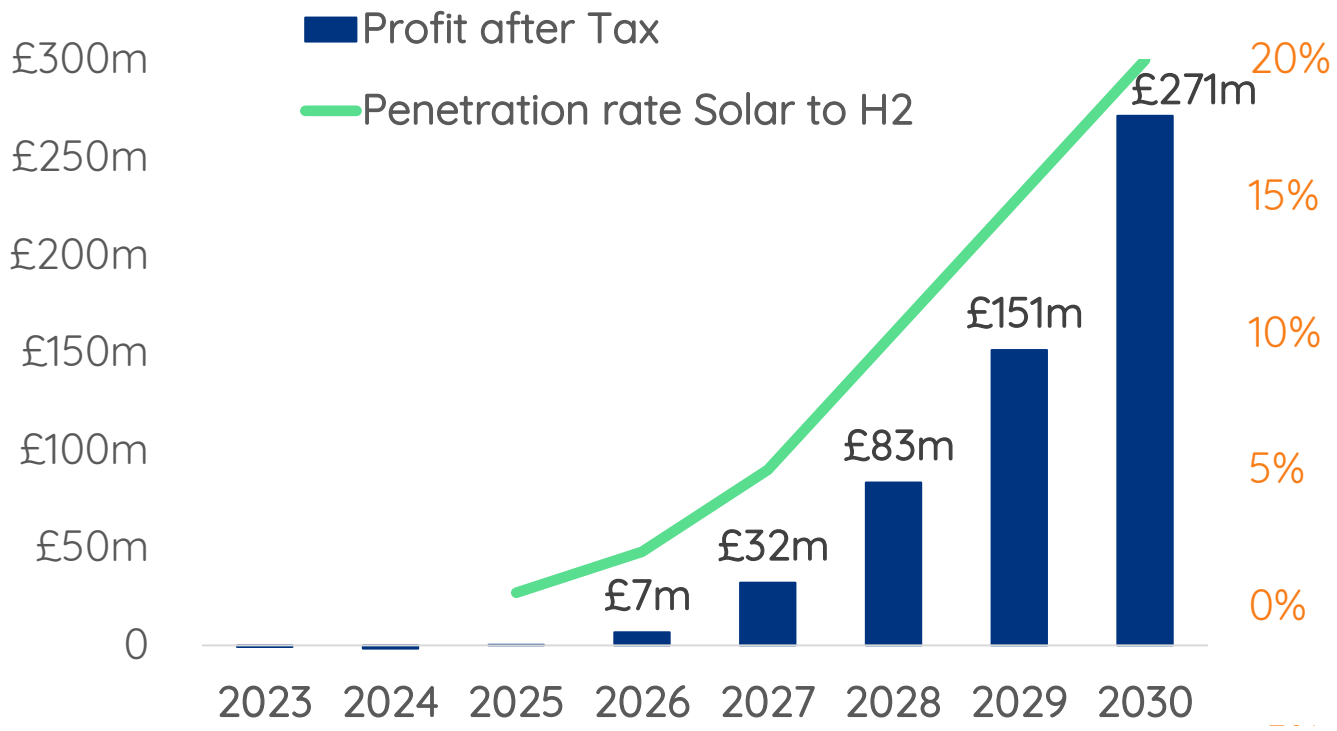
- **TAM** is the total low carbon H_2 production
- **SAM** is for solar to H_2 plants globally
- **SOM** is expected to be 8% of the solar to H_2 plants by 2030

HyWaves' primary focus is on solar to H_2 plants & will explore alternative energy generation assets, e.g. wind, in 2023



Business Model & Forecast Royalties

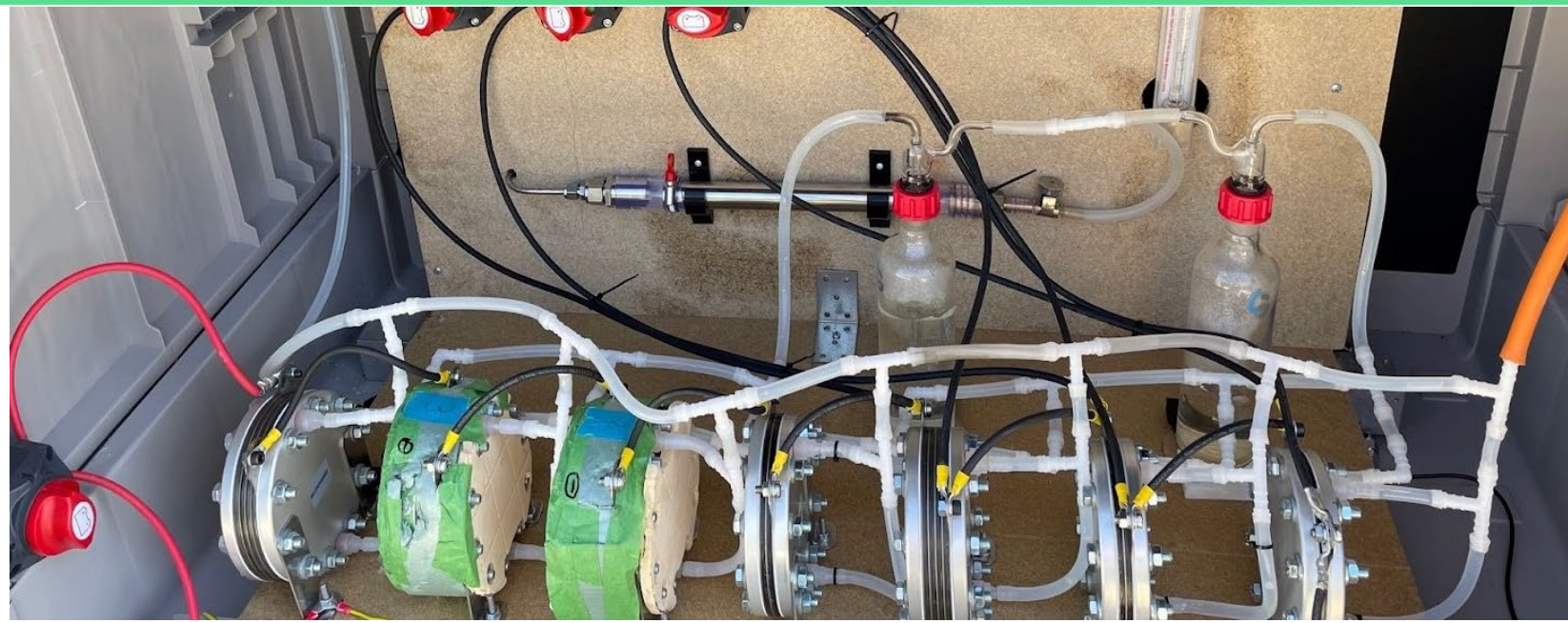
- The financial model is based on reducing the LCOH by 19%, which generates considerable economic value
- HyWaves will capture 8% of the economic value generated through royalties from electrolyser companies
- The penetration forecast is only for solar to hydrogen plants



Drivers

- Decarbonises heat, meeting the 2°C climate goal
- Reducing the dependency on Russian gas
- Provides hard to abate industries an alternative to gas e.g. steel, fertilizer, cement
- Solar developers can build solar to H_2 plants without the need for electric grid connections

Stage of Development



Phase 1

Validation of concept at 1kW scale (Completed)

Phase 2

Software development for automation & patent submission (by Nov ‘22)

Phase 3

Scaled to commercially relevant modular 20kW (gen-2) size with automation (by Spring ‘23)

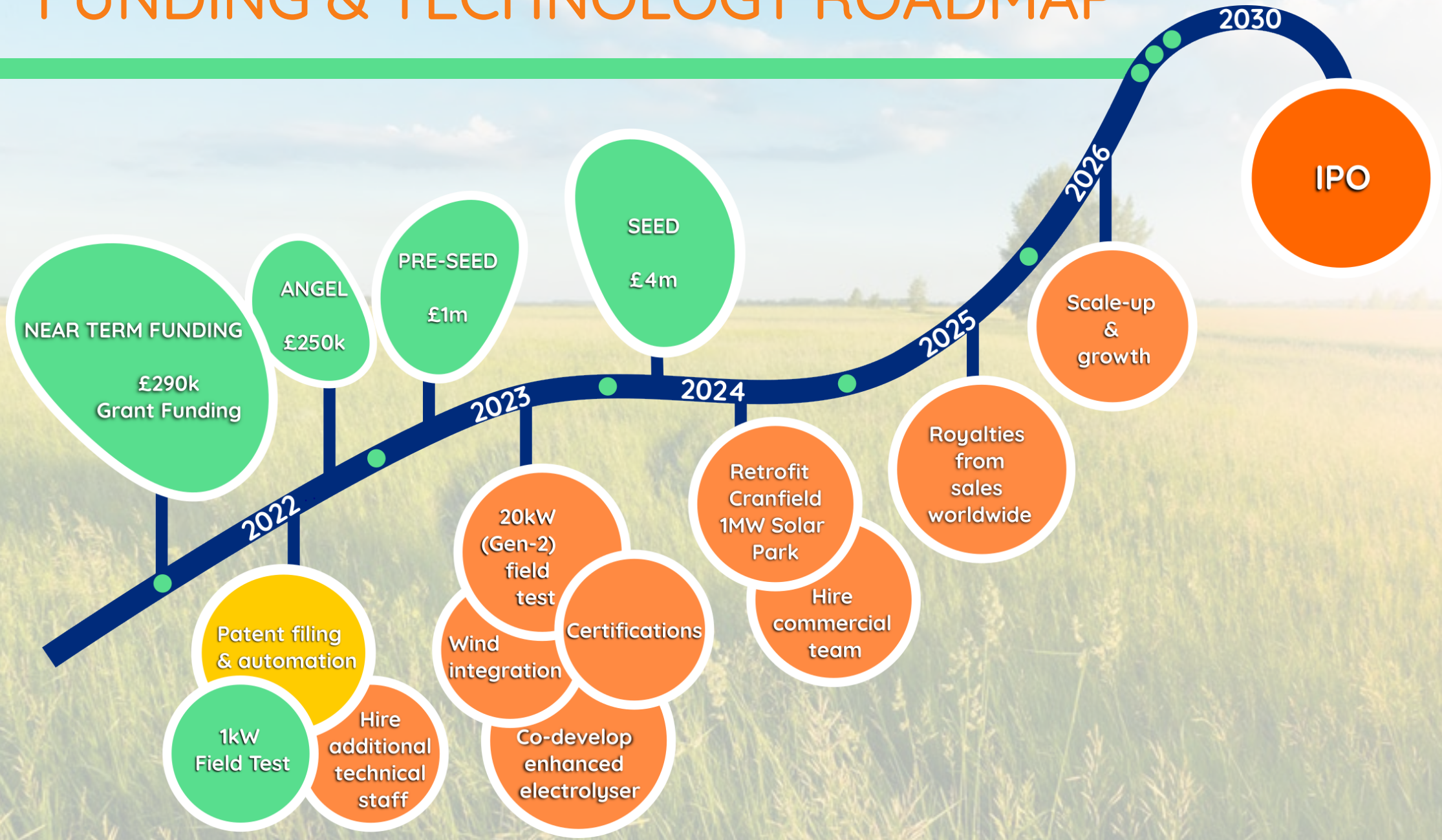
Phase 4

Addition of an energy storage system to optimise the system output & cost (by Autumn ‘23)

Phase 5

Add the compatibility of using a secondary green energy source, e.g. wind (by Winter ‘23)

FUNDING & TECHNOLOGY ROADMAP

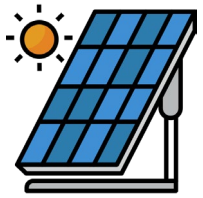


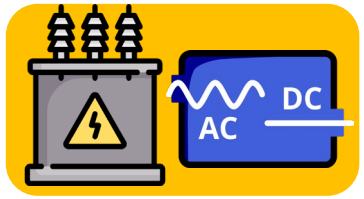
Competitor Overview

- **HyWaves** is a complementary technology for electrolyser manufacturers and is not in competition with electrolyser companies.
- We are focused on integrating our licenced technology into electrolysers to enhance their output and reduce expensive electronics.
- We are aiming for first mover advantage by securing a broad patent (submitted in Oct/2022)
- In future we expect that power electronic companies e.g. Siemens, Schneider, ABB will attempt to develop alternative solutions for solar to hydrogen plants or acquire or license HyWaves IP directly.

Go-to-Market Strategy

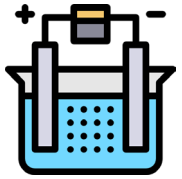
H_2 Assets





SIEMENS energy

ITM POWER



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Energy Companies providing H_2 to the heavy & chemical Industries

Shell

IBERDROLA

bp

Heavy & Chemical Industries

TATA

HEIDELBERGCEMENT

BASF

HyWaves will co-develop & licence the technology to electrolyser manufacturers

Team

Ugo Manfredi

CTO

40+ years in solar

Co-founded DS Logics, exit to TLC operator Cables & Wireless

Dr Tom Delaney

COO

10+ years in engineering

Founder of engineering consultancy in aviation & automotive sectors

Niall Haughian, CFA

CFO

12+ years in finance, 5+ in solar

Co-founder of 3 solar tech startups

Fernando Centeno

Energy Innovation Director

Business innovation expert

Dr Monica Saavedra

Non-Exec Director

CTO roles in material development

Co-founder of 2 technology startups

Iain Beath

Non-Exec Director

Serial investor in tech start-ups

Ex-solar farm developer

Advisors

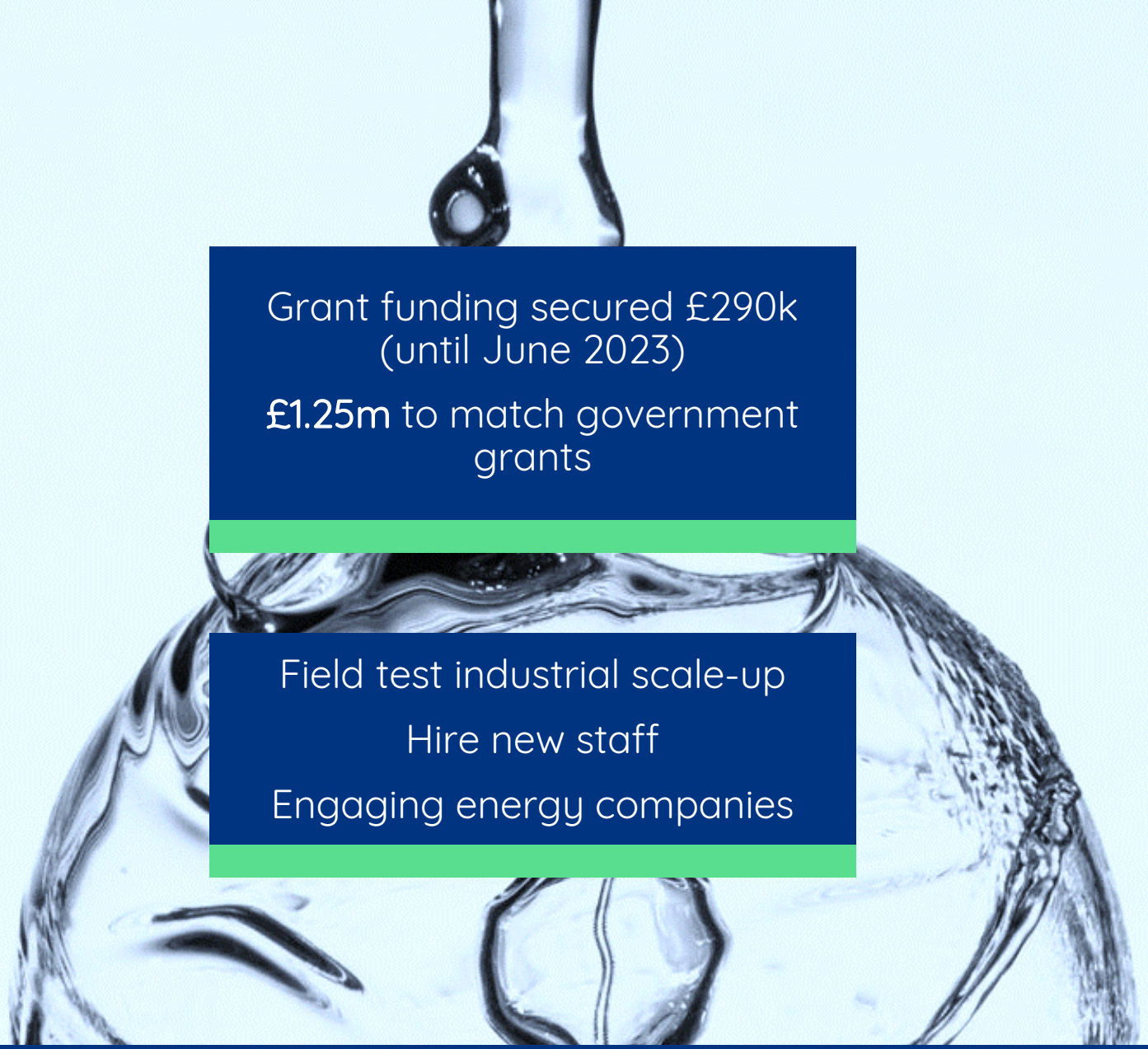
Cranfield University

Hydrogen production

Power Electronics

Solar PV

THE ASK



Grant funding secured £290k (until June 2023)

£1.25m to match government grants

Field test industrial scale-up

Hire new staff

Engaging energy companies

HyWaves has submitted in October S/EIS status for UK Investors

Niall Haughian, CFA - CFO

Niall@HyWaves.com

+44 7904 736459

HyWaves