

Enabling the energy transition with low-cost, scalable energy storage

Investor Presentation

January 2024

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Executive Summary



RheEnergise is developing a Long Duration Energy Storage (LDES) solution called High-Density Hydro®:

- Based upon traditional Pumped Hydro Storage (PHS), commercially proven over decades
- Closed-loop system uses a High-Density Fluid (R-19) to enable deployment on hills rather than mountains
- Scalable solution addresses deployment constraints of traditional PHS
- Best in class economics, fast to deploy globally
- Grid-scale (10-100MW) and long duration (4-16hrs)

Exponential growth in energy storage demand driven by adoption of renewables:

- Global annual market increasing 10x by 2030¹
- LDES (>4 hrs) predicted to be \$4 trillion market by 2040²

Customer engagement:

- 2 MOUs and 1 LOI signed (UK, Chile and Australia)
- Project Pipeline > £500m

Current contracts & grants:

- £8.25m, 100%-funded UK government contract for R&D and implementation of a 500kW, TRL7 demonstration project
- > £1.2m value awarded over several grants

Clear technology & IP roadmap:

- 2 patents granted, 1 further patent filed & 4 other patents in draft
- Proof-of-concept demonstrated
- 500kW HD Turbine developed, and currently under manufacture

Investment requirement:

 Now raising up to £4m Pre-Series A round, with £0.7m already closed

¹ Energy Storage Market Outlook 2021, Bloomberg NEF

² Energy Storage News. March 2023

Investment Case



RheEnergise team:

- Founders from cleantech, hydro, wind and aerospace sectors
- A team of 25 across the business with operations in Europe and North America

Strong market drivers:

- Energy storage exhibiting exponential growth rates
- Long-duration segment able to capture most value from renewable energy generation

Compelling value proposition:

- Benefits from similar best-in-class economics of Pumped Hydro Storage but much more scalable globally
- HD Hydro is capable of capturing wide range of revenue streams from energy arbitrage to grid services
- Project owners can achieve returns (IRRs) of up to 15% unleveraged

Strong competitive position:

- No known competitors developing similar technology
- Patents and know-how provide defensibility
- Clear competitive advantage of HD Hydro vs. other technologies for long-duration storage
- Technology being scaled-up and de-risked
- Global hydropower supply chain will be available to support commercial roll-out

Carbon impact potential:

- 0.2 gigatonnes of CO₂e avoided per annum by 2040
- Growing project numbers results in 1.2 gigatonnes cumulative by 2040

Excellent return on investment:

Delivering ~20x returns to Pre-Series A investors

Senior Management Team





Stephen Crosher, CEO & Co-Founder

Strong track record in innovation, commercialisation and management across energy, property and retail. Former Commercial Director of Quiet Revolution and CCO of X-Wind Power (wind turbines) and MD of Fleet Renewables (EVs, tidal, solar, biomass).



Graham Cook FCA MBA, CFO & Co-Founder

Over 25 years' experience in senior financial roles with focus on cleantech as CFO at C-Capture (carbon capture) and previously at Yorkshire Hydropower, Eel power and Q-Bot (hydro, energy storage, energy efficiency AI). Experience includes raising tens of millions of funding for cleantech.



Dr Tamás Bertényi, CTO & Co-Founder

Active in sustainability and decentralised energy since 2002. PhD in aeronautical engineering and former Director of Innovation and Research at Quiet Revolution and multiple start-ups in the climate sector. Experience includes raising tens of millions in grants and equity funding.



Sophie Orme MEng, Commercial Director

20 years cleantech experience from start up through to high growth, covering solar, wind, energy storage and sustainability. Led Centrica's renewable and energy storage workstream for Cornwall Local Energy Market. Former Projects (£200m P&L) and Innovation Director at Solar Century. Aerospace MEng, Innovation MIT & Business Sustainability at Cambridge.



Jim Campion, Non-executive Chairman

Recent MD of Actis' Rezolv Energy Fund. Previously Partner at EnerCap Capital, private equity fund investing in renewable energy projects in the CEE region. Former CEO at Quiet Revolution and held senior positions at Biomass Engineering and Bowman Power. Experience of investing in power projects (up to £1.3 billion) and technologies. Fellow of the Energy Institute.

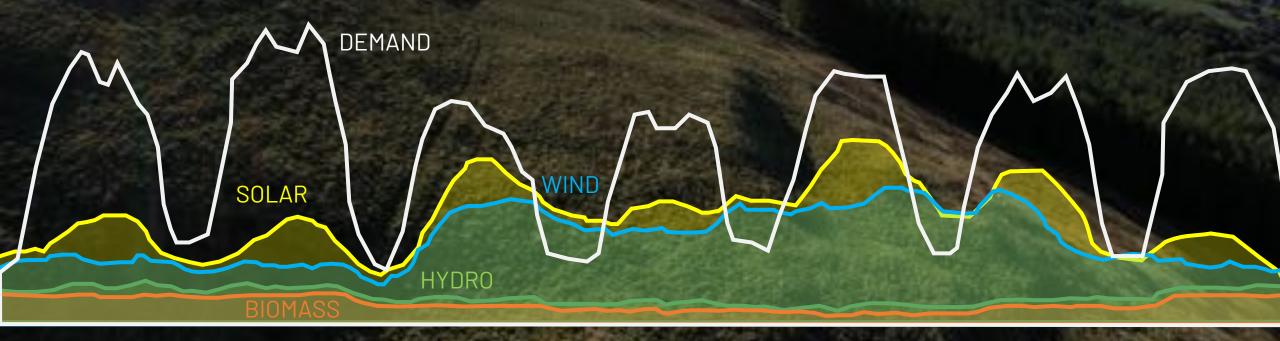
Long Duration Energy Storage is Becoming Essential



The urgent need to decarbonise global energy systems is driving huge growth in renewable energy. This growth is primarily made up of intermittent generation (wind and solar), which does not match energy demand¹.

To get to 100% zero carbon grids, we need long duration energy storage to balance renewable supply with demand, at the lowest cost to the consumer.

The sheer scale of storage needed, and the lack of time to achieve it, is the real challenge.



Pumped Hydro Storage is Lowest Cost But Has Constraints

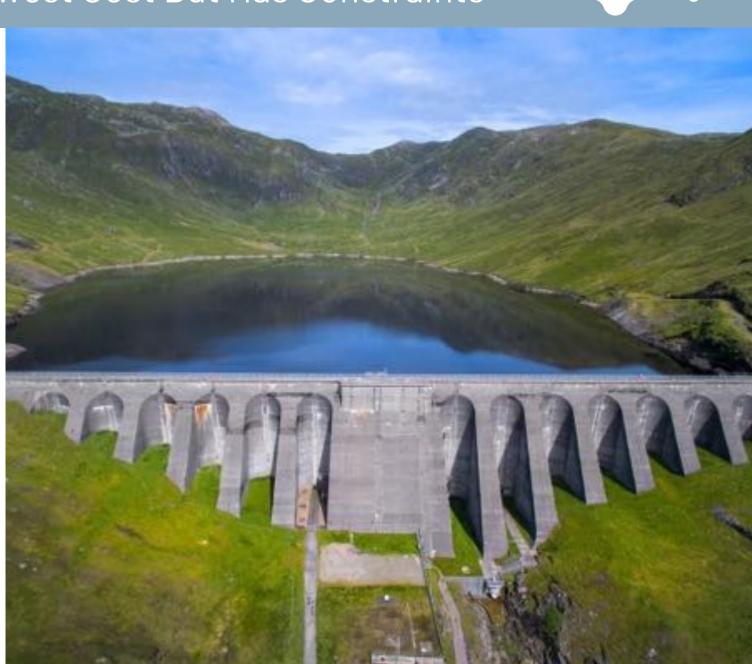


Mature, low-cost technology:

- >98% of electrical energy storage globally
- Lowest cost of storage where sites are available
- True infrastructure assets: 60+ year lifetime, minimal performance degradation
- But historically only 4-6GW per annum being developed, out of the predicted 2,100GW by 2040

Global deployment constrained by:

- Very large scale
- Require specific geographics: >300m vertical elevation and valleys that can be dammed
- ~15 year development timeline
- High-volume water abstraction
- Environmental and social impacts: permitting process lengthy and costly



High-Density Hydro® Solves Problems of Traditional Pumped Storage



HD Hydro® replaces water with a High-Density Fluid (R-19), meaning projects can be **installed on hills 2.5x lower and still achieve the same power**. Hills, not mountains, mean more sites close to user demand, and at lower upfront CAPEX



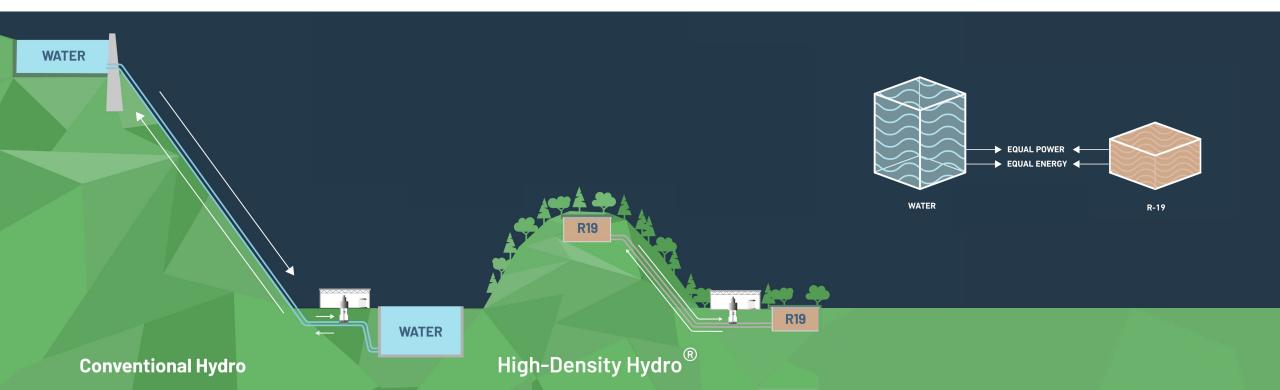
Projects are 2.5x smaller by volume, meaning **lower** construction costs, faster build times and easier landscaping. Projects can be entirely hidden, simplifying planning permits



Closed loop system **avoids social & environmental issues** associated with traditional pumped hydro & can be **used in hot, arid climates without risk of evaporation**



Land use and construction times are comparable to both gas-peaking plants and wind farm projects, with a much **shorter development lifecycle**



R-19: High-Density Fluid



Consists of a suspension of dense mineral in water:

- High density (2.5x that of water)
- Low viscosity (reduces energy losses in system)
- Stable composition
- Non-toxic and non-reactive (independently tested by UK laboratories)

R-19 currently uses a commonly available mineral:

- Globally abundant, mined directly or as a by-product from extraction of other materials
- Used in applications such as paints, papermaking and drilling mud for oil & gas (>60% global demand)
- Total global production is 8 million tonnes per annum (2011-2020), available on all continents
- RheEnergise seeking to diversify sources (e.g. lower cost waste from other industries) and mineral types



Commentators Predict Huge Market Opportunities



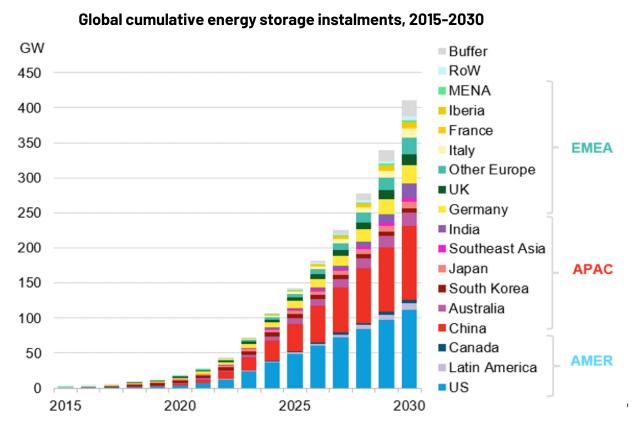
By 2040...

40-50x more utility-scale energy storage needed¹

2.1 TW additional capacity

(> 10x current capacity)²

\$4 trillion market for longduration storage (LDES)³ A 10x increase in the global energy storage market in 8 years:



Source: Bloomberg NEF

¹US Inflation Reduction Act (installed capacity in GW, 'deep green' scenario, USA)

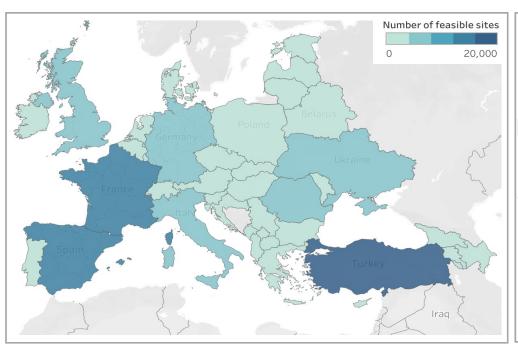
² Energy Outlook 2021, IEA

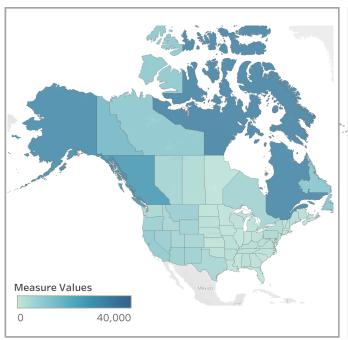
³ Energy Storage News. March 2023

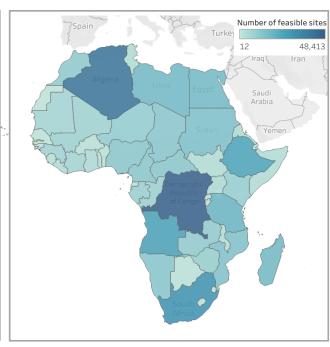
Sites Available Everywhere



Via GIS screening, RheEnergise has identified sufficient potential sites to meet the needs of the energy transition **several times over**.







> 1 million global sites identified

UK 6,600
Europe 116,000
Middle East 75,000
Australia & Indonesia 98,000

North America

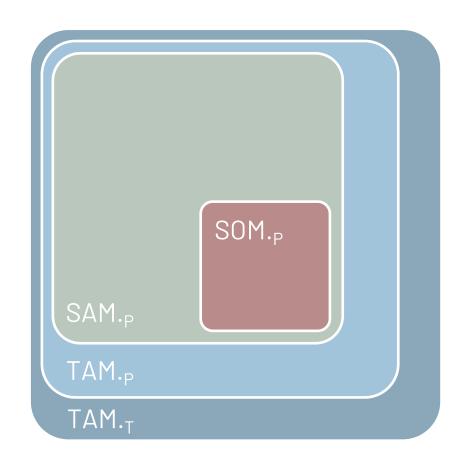
342,000

Africa 4

445,000

Addressable Market





\$4 trillion Total Addressable Market (TAM._T) by 2040

- \$3 trillion power (TAM._P) & \$1 trillion heat
- 2.1TW of LDES by power globally
- McKinsey LDES report 2021

\$2 trillion Serviceable Addressable Market (SAM._P)

- 2/3 of LDES requirement is 4-16hrs (Aurora GB market)
- 8 % of available sites (RheEnergise's GIS topographical screening for global sites (avg. 35MW, 8 hrs))

\$300 billion Serviceable Obtainable Market

- 15% of SAM or
- 1% of available sites
- 250 GW

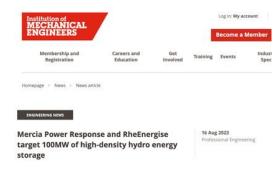
Project Pipeline of > £500m and Building











Since July 2023, RheEnergise has signed commercial agreements in 3 key strategic markets:

UK

MOU with Mercia Power Response targeting a 100MW pipeline pre-2030.

Chile

MOU with Colbún (major Chilean utility with large hydro portfolio) to conduct HD Hydro feasibility in Chile.

Australia

LOI with ambitious renewable energy developer targeting modular system build out. Commissioning to coincide with closure of coal power plants.

Our Pipeline Use Cases



In addition to the MOUs, RheEnergise has built an extensive pipeline of >130 active leads in 20+

countries, across multiple use cases.

Global mining corporate, Aus 25MW, 16 hrs £80m

Off-grid LDES co-locating with solar at remote mining site

1. Supporting mines to decarbonize

Large UK developer 3x 100MW, 6-8 hrs £25m to £40m each

Developer has multi-GW UK grid portfolio. Evaluating 3 pilot projects as part of renewable 'hub' sites.

HD Hydro Use Cases

3. Firming renewable **PPAs**

4. Island grids

2. Grid services &

energy arbitrage

Microgrid paired with H2 electrolyser, UK 10MW, 6-10 hrs £20m to £30m

Off-grid island application, maximizing solar potential with no export connection.



Firming supply of large-scale solar at quarry site with no export.



HD Hydro® Characteristics and Key Metrics



Characteristic	Target Range
Power	10 – 100 MW
Duration	4 – 16 hrs
Annual Cycles (typical)	260 – 500
RTE	80 %
Site elevation	100 – 250m
CAPEX	£190k - £430k /MWh
OPEX(£k/MWh/yr)	2.4 - 5.2
Footprint Typically 0.5-3.0 hectares (top & bottom tanks); Distance between tanks 500m to 1,500m (up to 3,000m)	60 – 300 m ² /MWh
Construction Time	9 – 24 months
Development Time (months)	9 – 18 months
Further cost Reduction to 2040	30 %



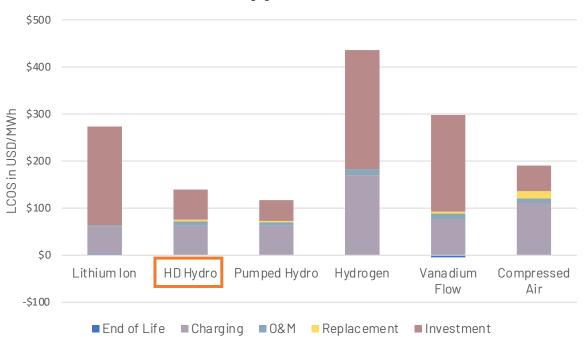


Examples of excellent sites for HD Hydro®

HD Hydro® vs Competition - Levelised Cost of Storage



LCOS Comparison for Energy Arbitrage Application

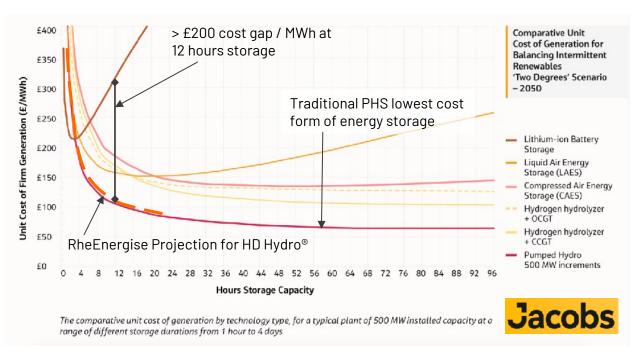


HD Hydro costs for 20MW / 8 hour project; US\$50 energy purchase price; 8% discount rate

Technology & performance data sourced from: Schmidt & Staffell . Monetizing Energy Storage. Oxford University Press, 2023; Parameters updated using Roland Berger LDES technology cost report for LDES Council, May 2023

LCOS calculated using https://energystorage.shinyapps.io/LCOSApp/

Jacobs: Unit Cost of Firm Generation. Dec. 2020



Benefits of HD Hydro approach:

- Significant opportunity to reduce civil engineering costs (typically ~65% of capex in PHS projects)
- Closed-loop system requiring 1/5th water volume of PHS
- 2-3 year total project development timeline
- Minimal environmental and social impacts
- Project IRRs of up to 15% unlevered and >15% levered

Technology Status



RheEnergise was awarded an £8.25m, 100%-funded contract from UK government to undertake the initial R&D and then deliver a 500kW, TRL7 demonstration project.

The project is scheduled to be operational Q3 2024 at an active mine site in UK:

- ✓ Designed and developed 500kW turbine optimised for use with R-19 fluid, currently in contract manufacture (bottom right)
 - Computational Fluid Dynamics validation with TUV-SUD
- ✓ Proprietary R-19 fluid, tested extensively in lab conditions
- ✓ Fluid management system developed ready for deployment
- ✓ Pumps and valves sourced

Whole system proof of concept demonstrated in test rigs and via field demonstration.





Design and build of proprietary HD turbine

IP Status



RheEnergise is building a defensive IP "moat" across critical sub-systems and specific HD Hydro components, from the set-up of the whole system to the R-19 Fluid, turbo-machinery, flow control and fluid management systems.













Patents

- 2 patents granted (global PCT phase)
- 1 further patent filed January 2024
- 4 further patents in progress



Trademarks

Granted or pending in multiple jurisdictions worldwide:

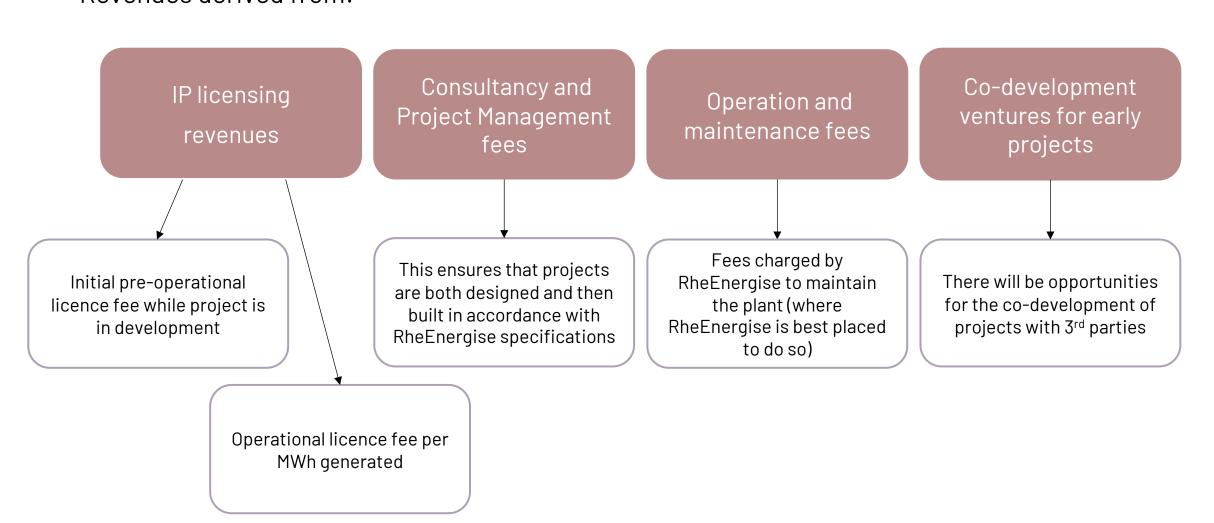
- HD Hydro®
- High-Density Hydro®
- RheEnergise® and Logo

Business Model and How We Make Money



Customers include utilities, developers, high energy users, funders and network operators.

Revenues derived from:

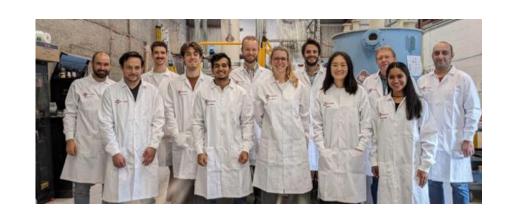


Company Status



Founded 2019, now has 25 employees:

- Commercial, operations, project management, finance and formulation chemistry functions based in London, UK
- Technology centre for R&D and engineering development based in Montreal, Canada



2019-2020 8 grant awards, totalling £820k

MAY 2021

First FT Employee beyond founders

DEC 2021

£150k feasibility study contract from UK government

JULY 2022

System field test in Canada

DEC 2022

2nd patent granted and £1m grant to advance formulation chemistry

MAY 2023

Demonstration project tenders returned

AUTUMN 2024

Demonstration project commissioning

H12026

Commence construction of first commercial projects































MAR 2021

£888k Seed 1 Round

MID 2021

Opened lab facility (3 R&D engineers & CTO) in Montreal

APR 2022

Indoor tests, validating core hypothesis: elevation reduction potential

SEPT 2022

£8.25m contract from UK government to deliver 500kW demo project

1st patent granted

JAN - MAR 2023

£1.8m Seed 2&3 Rounds

JUNE 2023

Complete HD Turbine designs and place orders for manufacture

Financial Projections

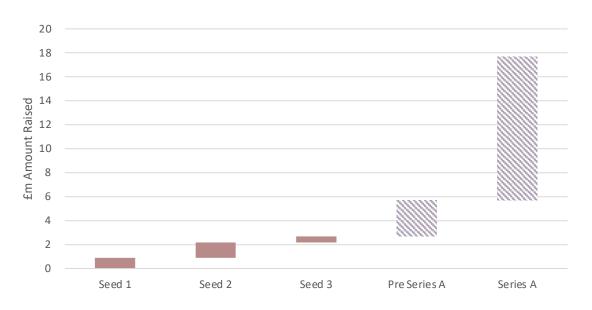




Investment Requirements & Returns









- Raising up to £4m Pre-Series A round, with £0.7m already closed
- Complete UK government-funded demonstration project
- Develop HD Hydro system towards TRL9 & strengthen IP
- Build further commercial traction globally
- Expand team
- Delivering ~20x returns to Pre Series A investors



