



Doubling the efficiency of hydrogen storage at **half** the cost

Breakthrough new material for H₂ storage

Goal of \$1USD per kilo for dispatchable storage

Abating millions of tonnes of CO₂ annually by 2030

Building H₂ supply chains to reach net zero faster

Seeking partners for delivery on trials & pilots

I'm Dr Jehan Kanga of **Rux Energy**, and I want to show you how we can accelerate our path to zero carbon by **halving the cost** of hydrogen supply.

Our recent travels around the world, from Abu Dhabi to Singapore via the USA, UK and Europe, have revealed **gaps in awareness** of the options now available. So what I'm about to share will hopefully come as a welcome surprise - and inspire you to take action that will assure a successful sustainability plan.

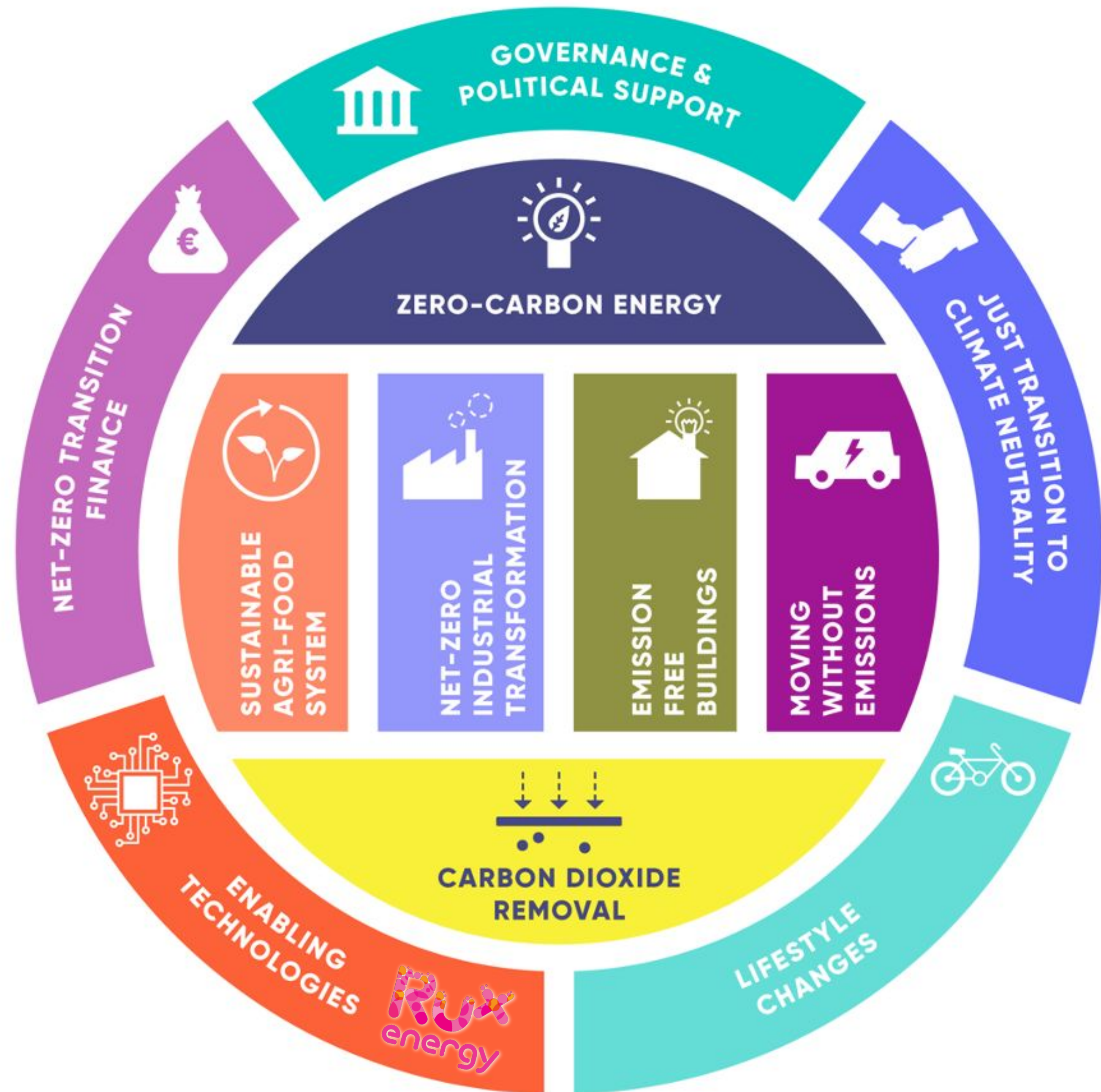


The world is **aligning** to tackle the climate crisis, and we're reaching a tipping point.

From \$350 billion **IRA** in the US, to Singapore's **Green Action Plan**, or the UK's £53 billion **Net Zero** strategy, governments all around the world are implementing bold plans and budgets for their decarbonisation goals.

Banks are **divesting from fossil fuels**, and shifting funds to clean technology. Governments are coming together to create **bilateral agreements** to support the work that needs to be done.

The time to take act is **now** - but the right steps have to be taken, in the right order.



Unfortunately, while sustainable energy is prolific and scaling, our **hardest-to-abate** industries are moving too slowly, and they're responsible for **nearly half** of the world's emissions - that's why Rux is focusing on solving this problem as a **first priority**.

The blockers to achieving **net zero** might *seem* impossible to overcome, but green energy has come a long way and we're here to share what we believe the best way forward is.





To start with, **Rux** seeks to eliminate capital investment for end users, driving **higher productivity** for every dollar of funding needed to decarbonise.

Building **capex heavy** new systems that will likely be obsolete within the next decade isn't what we're about. We need to move fast, but **deliberately**.

Let's talk about **how**.



Hydrogen is a key part of the solution, and although it's already being used in trains & trucks, (and trialled in planes & ships), affordable, high density, efficient and safe storage has been a problem.

It's been so hard to achieve that it accounts for up to 80% of the total cost to end users.

And without it, high emissions fuels continue to to be relied upon.



As a result, **End-User** countries like Singapore are still weighing up benefits versus risks, and haven't settled on which option will work for them.

Producer countries like Australia, Oman, Chile and the UAE are on the way to reducing the production cost of hydrogen below US\$2/kg - but **outdated modes of storage** are slowing adoption.

And all countries are struggling with domestic **supply and distribution** of hydrogen for the same reason.



The good news is that Rux has developed **advanced materials** called **MOFs**, which act like molecular sponges.

The *great* news is that Rux MOFs **DOUBLE** the density of hydrogen storage, at **HALF** the cost.

We're commercialising these **breakthroughs**, developed from my PhD, in **collaboration** with:



UNSW
SYDNEY



THE UNIVERSITY OF
SYDNEY

And we're growing our **global R&D** footprint, building Australian and international projects, and fostering **bilateral cooperation**.

Through **collaboration**, we can solve our hardest-to-abate challenges **together**, minimising double-work while enabling data sharing - maximising investment additionality, abatement **impact** and **velocity** of transition.

For context, 1 gram of **Rux MOFs** can hold the equivalent of a **football field's** worth of hydrogen



For the more technical among you, it's the combination of **high surface area** and **hydrogen selectivity** that works the magic, overcoming the self repellant nature of the gas that typically makes it so hard to store and transport.

It's a **nanoscale innovation** that allows macro scale improvements, and it changes everything we know about hydrogen storage and distribution.



Many of the organisations we've spoken with have asked us about **ammonia** and **liquefaction**.

While we believe they have a *place* in the transition, ammonia poses severe **safety** risks, whereas liquefaction suffers massive efficiency **losses**, so these aren't long term solutions.

We're also hearing about trials of synthetic green fuels like **e-methanol** and **e-kerosene**, which can still produce emissions, and often require **expensive capex**.

We believe there's a better way, a way that will set us up for **long term** success.



And while other research groups might be working to improve the efficiency of hydrogen storage, **Rux** offers something unique - an **agile** system designed with a net zero future in mind, taking into account **safety, life cycle, and ease of use** alongside density gains.

A **solution** that not only works immediately, but also guarantees the **viability** of decarbonisation long term.



Our system that takes these factors -
and more - into account.

Composite tanks filled with **Rux MOFs** - a refillable,
containerised solution with a **lifespan of decades**, that poses
far **fewer safety risks**, and maintains its storage efficiency
throughout the full cycle, including dispatch.

Available in every format from
tanker trucks to shipping containers, and transportable
through **existing freight infrastructure**.



Rux is increasing **efficiency**, while dramatically reducing the **cost** of hydrogen storage

All using **existing infrastructure** or, where none exists, minimising transition infrastructure capex.

We're considering the **next 5 decades** in our design, rather than just the next *step*.



We plan to move bulk hydrogen at *twice* the volume and less than *half* the price of conventional packaged methods, getting hydrogen to first adopters cheaper and faster.

A current major hydrogen distributor charges *\$15USD/kilo*

Our end goal is *\$1*








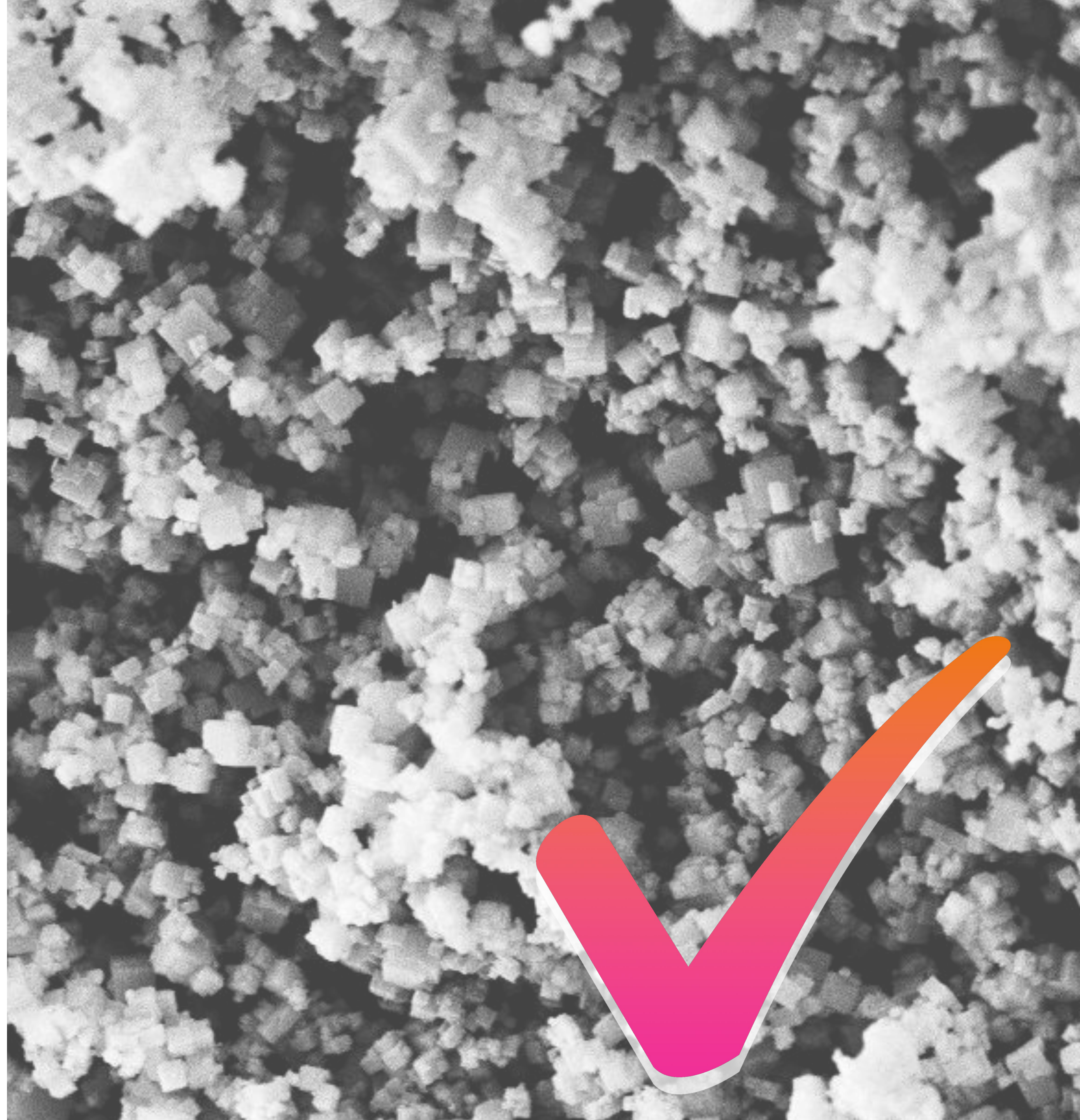
A single 40 foot Rux container will replace
5.7 million litres of diesel EVERY YEAR



Abating **15,000 TONNES** of CO₂ annually

Of course, industrial **success** of any hydrogen storage method relies on multiple key metrics, and **Rux MOFs** meet them all:

-  **Air & water stable (safe)**
-  **Dispatchable**
-  **Interoperable**
-  **Sustainable manufacture**
-  **Fuel cell compatible**



See how **Rux** compares to other **H₂** tech solutions

H ₂ TECH	HIGH DENSITY	LOW COST	SAFE TO HANDLE	DISPATCHABLE	INTEROPERABLE	SUSTAINABLE MANUFACTURE	FUEL CELL COMPATIBLE
RUX MOFs	YES	YES	YES	YES	YES	YES	YES
AMMONIA	Yes	Yes	No	No	No	Yes	No
COMPRESSED H ₂	No	No	Yes	Yes	Yes	No	Yes
LIQUIFIED H ₂	Yes	No	No	No	No	No	No
METAL HYDRIDES	Yes	No	No	No	No	No	No

FREEPORT EAST

Felixstowe
Gateway 14
Harwich



Rux is making cost effective, **long term viable hydrogen supply** a reality with our first pilot trials.

We're working closely with the **UK government** on a major supply chain project in the Freeport East hub.

We're solving a massive problem for them, because pipelines just aren't feasible to move the 40 tonnes of green hydrogen Scottish Power will generate daily.

Ports will even be able to on-sell the energy they're generating, creating a **new revenue stream**, all while reducing emissions.

This trial creates the blueprint for **supply chain feasibility** studies worldwide.



Our advantage is that we're **efficient, safe,** we don't need **heat** or **chemical changes,** and we'll work side by side with you to **build the ecosystem** needed for rapid deployment and regional success.

And as you can now see, we're in this for the **long haul,** and will be there to support you for your **future needs** as well as your immediate ones.

Collectively, we'll advance the world to net zero by 2050.

To drive down the **total cost** of hydrogen to end-users, Rux builds **supply chain ecosystems**, developed through regional feasibility trials run in partnership with local universities.

Essentially, Rux delivers an **ecosystems toolkit**, and a build guide - like an IKEA cheat sheet, with **Rux MOF tanks** as the Allen Key.

The right tool for the right job, with clear assembly instructions to ensure **success**.



There are **other applications** for our MOFs, including heavy industry, construction, rail and trucking.

And by engaging and utilising existing freight infrastructure, we:

- Supply hydrogen to end users **rapidly**
- **Share** the cost of distribution among dozens of stakeholders
- Engage regional SMEs as champions, growing the market *and* **building the ecosystem**

The potential for impact on **emissions reductions** is almost too potent to comprehend.





We're **transforming** outdated industries.

We see room for improvement in everything from productivity of **long duration storage**, to validating **financial feasibility** for hydrogen pipelines, and supplying hard to reach regions with the **lowest cost** packaged hydrogen.

Rux is intentionally **hacking** the hydrogen learning curve through a combination of **technology enabled productivity** and decentralised **regional** ecosystem coordination.



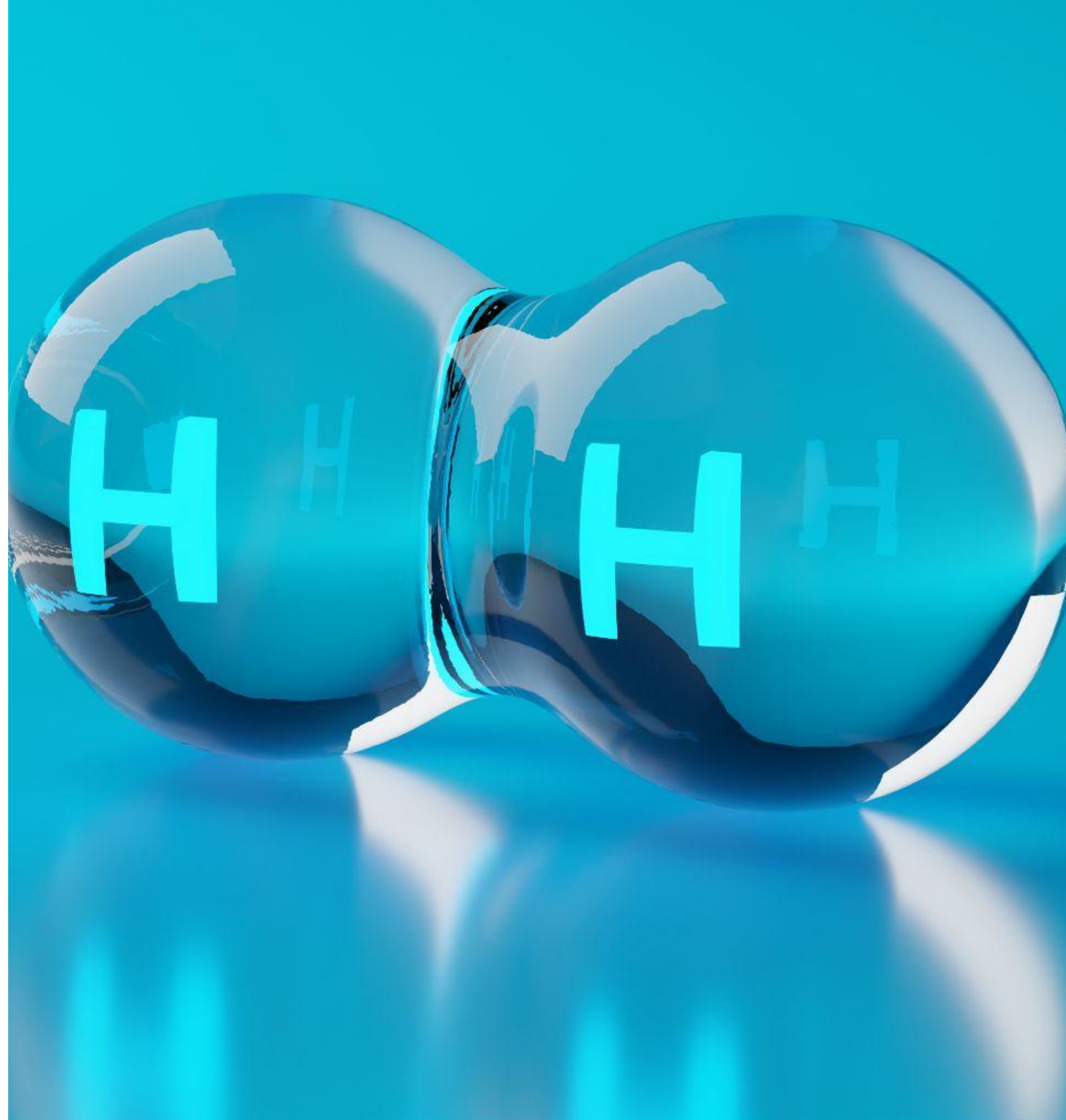
Rux anticipates **100,000 new workers** will be needed by **2035** for the green hydrogen industry - everyone from chemical engineers and systems mechanics, through to maintenance crews and IoT specialists.

We foresee our supply chain and production partners needing an additional 100,000 workers, skilled in everything from materials manufacture to administration and operations.

So **education and training** are also a core part of our larger plan - to deliver the skills needed to manage a booming new industry.

Rux sees **value** as more than just revenue. It's in the tonnes of **carbon abatement** we facilitate, and the robust new ecosystems we're creating to allow regions to deliver their **net zero** targets.

Our **goal** is to be directly responsible for **50 million tonnes** of CO₂ abatement, each year, every year, by 2030.



First phase **Rux MOF** tank product range:

Micro 40L | 2kgH_2 | **50KWh*** (micro-prototype)

Suitable for small gensets & on-vehicle storage

Mini 4000L | 200kgH_2 | **5MWh*** (mini-bulk)

Suitable for construction site power, & small port vessels

20ft | **23000L Bulk** | 1150kgH_2 | **29MWh***

Suitable for medium bulk transport, & shore to ship power

40ft | **46000L Bulk** | 2300kgH_2 | **58MWh***

Suitable for large bulk transport, & shore to ship power

*dispatchable electricity output



Rux Leadership



Dr Jehan Kanga
Founder & CEO



Dr Marlene Kanga AO
FAICD FISC FTSE
Rux Chair



Prof Cameron Kepert
Chief Scientist



Bill Sayer
Business Advisor

Technical, Advisory & Operational



Dr Shane Cox
Product Engineering



Nicolle Lane
Ecosystems Manager



Jörg Schüler
EU Commercialisation



Evert Den Hollander
ex Macquarie Capital



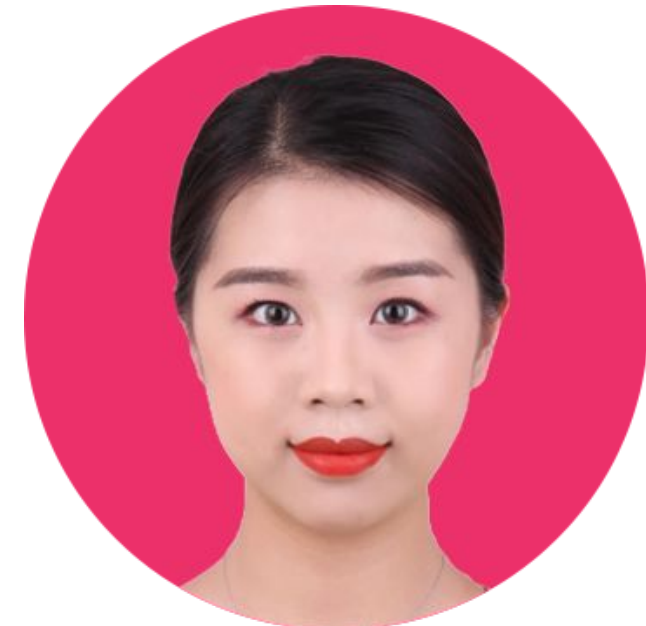
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Senior Sorption Scientist



Dr David Dharma
Senior Scientist



Robert Walwyn
Research Manager



Dr Luonan Xu
Scientist



Prof Vanessa Peterson
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Dr Sam Duyker
USYD



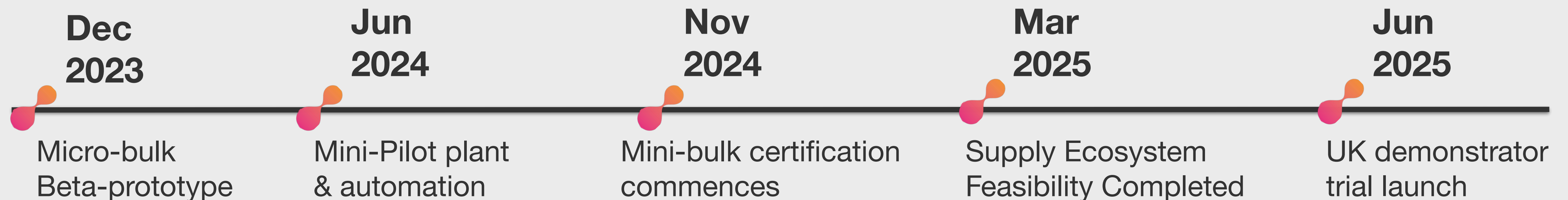
Prof Gangadhara Prusty
UNSW

RUX AT A GLANCE

- Residents of Cicada Innovations, Australia's leading deep tech incubator
- TRL5/6
- A\$7M grant funding in flight
- Over 85 international partners
- Series A investment round Oct 2023

Winners of:

- **Hy-FCell Stuttgart** Products & Markets Award (2022)
- **NERA** LETs Pitch Australia (2022 & 2023)
- **SelectUSA** Global Cleantech Investment Summit Pitch Comp (2nd place 2023)





RUX MEDIA

- Hydrogen Central [article](#)
- InnovationAus [podcast](#)
- Cicada Innovations [case study](#)
- World Energy Future Summit [podcast](#)

Summing up:

- 🔗 We've got the magic **MOFs!**
- 🔗 We make hydrogen **cost competitive** with fossil fuels
- 🔗 We're **triallying** in Australia & the UK already
- 🔗 We can help you **deliver** on your net zero targets



Tell us what your hydrogen supply issues are,
so we can deliver the **right solution** for you

Let us help you accelerate your path to **zero carbon**

Rux Energy acknowledges the Gadigal & Dharawal people of the Eora nation, and the Bunurong people of the South-Eastern Kulin Nation, on whose lands we conduct our research and business. Sovereignty was never ceded - always was, always will be Aboriginal land.



Accelerating our path to **zero carbon**

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