

Power to X

TRANSFORMING RENEWABLE ELECTRICITY
INTO GREEN PRODUCTS AND SERVICES



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venture
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Te Puna Umanga

What is Power to X?

RENEWABLE ELECTRICITY TO GREEN PRODUCTS AND SERVICES

Power-to-X is an umbrella term for a number of conversion, storage and reconversion pathways that use surplus electric power from renewable energy, typically solar and wind.



Source: trena.dk/en/power-to-x/

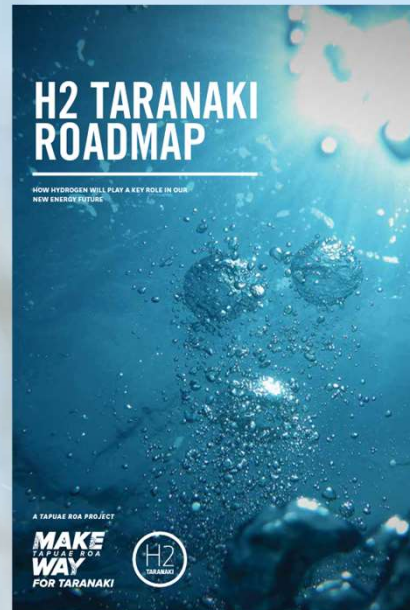
Why explore this?

- Advancing energy security
- Lowering emissions
- Nation building
- Smart economy, advanced manufacturing, jobs, green/future focused technologies...



Power to X

A JOURNEY



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Offshore Wind

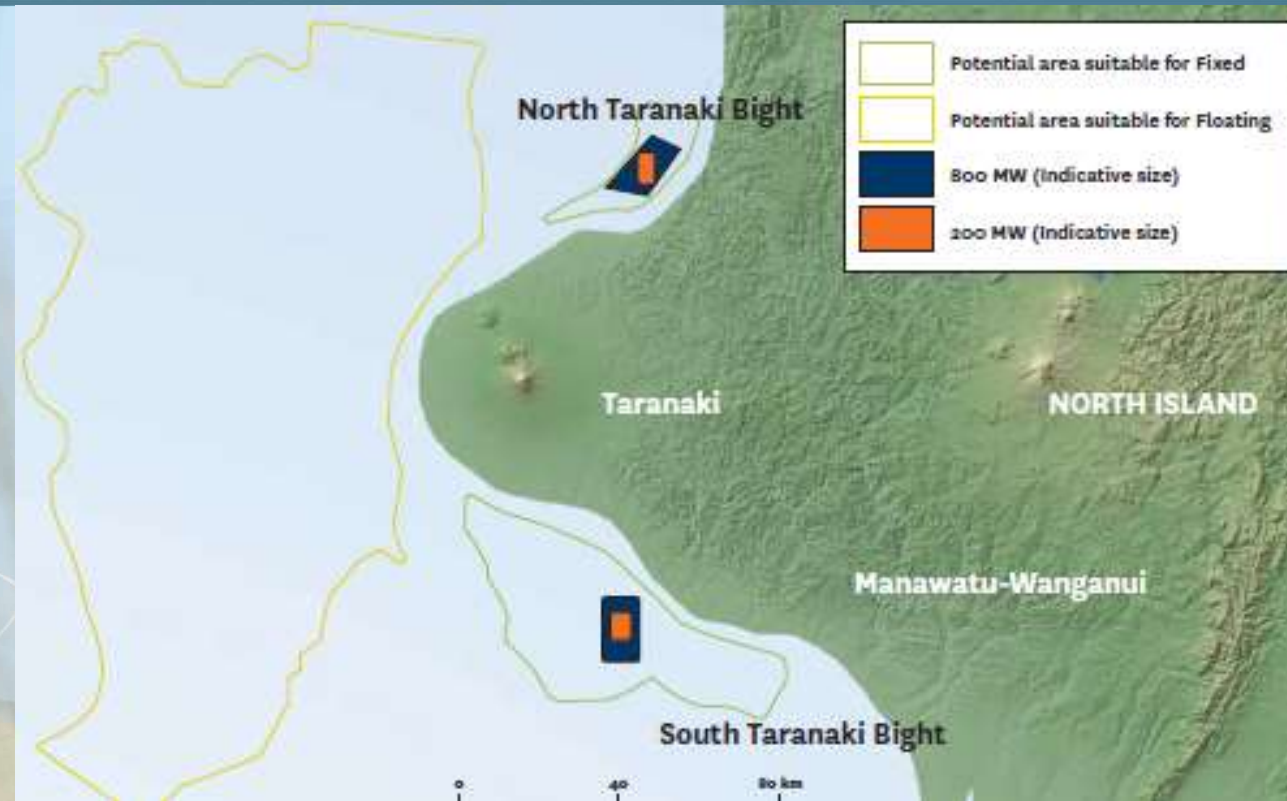
AN UNTAPPED RESOURCE

Based on World Bank figures...

"New Zealand can provide 150 times its current electricity generation from off shore wind".

But why bother developing it?

Especially when we have more than enough consented wind for our domestic needs...



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Answer: Power to X

THERE IS HEAPS WE CAN DO!

Imagine the potential to contribute to, not only New Zealand's domestic energy needs, but also:

- underpin an immense green product manufacturing opportunity
- attract energy intensive industries
- foster new exporting opportunities

Power to X

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Concept paper, December 2021



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Brief Introduction to Hiringa Energy

HIRINGA IS CONNECTING THE GREEN HYDROGEN VALUE CHAIN



Make Clean Hydrogen

We develop commercial scale **green hydrogen** production projects using electrolysis from renewable electricity and biogas, forming joint ventures where appropriate with commercial and industrial partners.



Develop Hydrogen Infrastructure

Together with partners, we develop and invest in hydrogen distribution and refuelling infrastructure across New Zealand to **decarbonise heavy transport**.



Facilitate Market Use of H₂

Partnering with **New Zealand's largest road transport companies**.

Working with global manufacturers to introduce hydrogen technologies.

Establishing offtake for industry and export.

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PATHWAYS

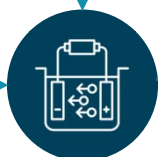
Wind Power



Water



Electrolysis



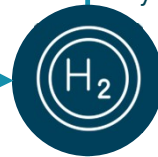
Oxygen



Carbon Dioxide



Hydrogen



Nitrogen



Green Methanol



- Transport
- Chemical feedstock
- Energy storage
- Power generation
- Export
- Heat

Green Hydrogen



- Transport
- Chemical feedstock
- Energy storage
- Power generation
- Export (liquid)
- Heat

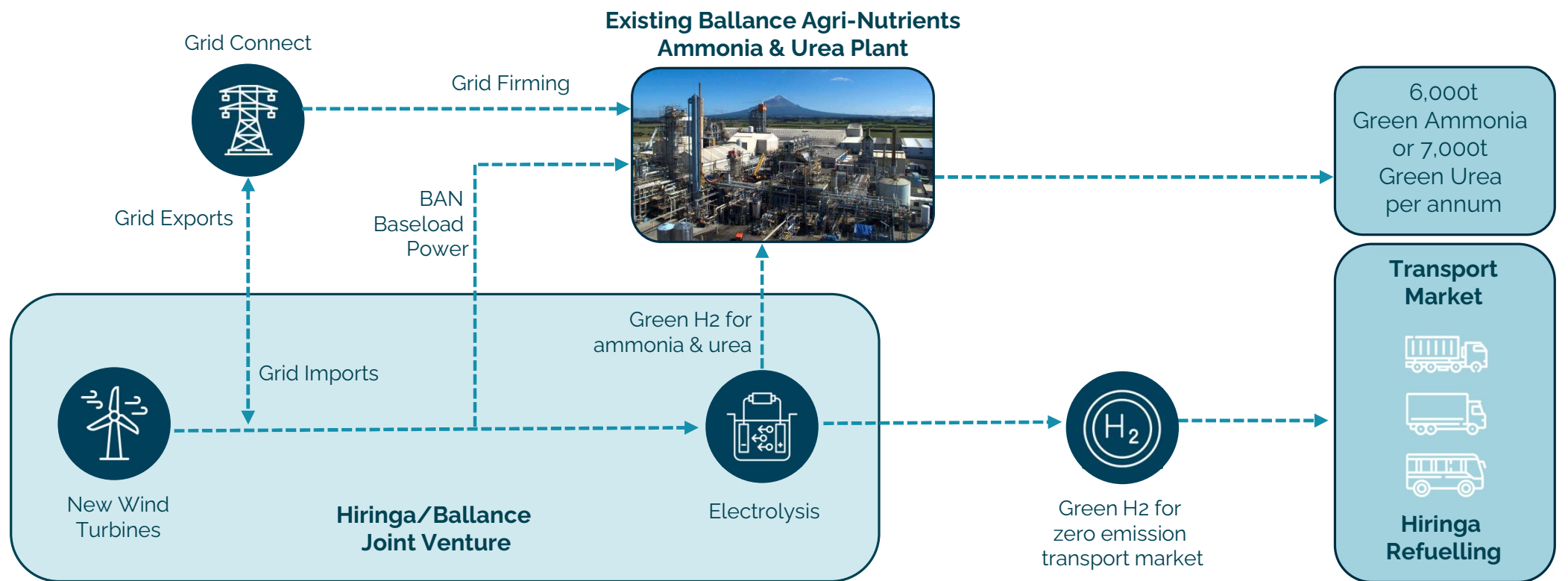
Green Ammonia



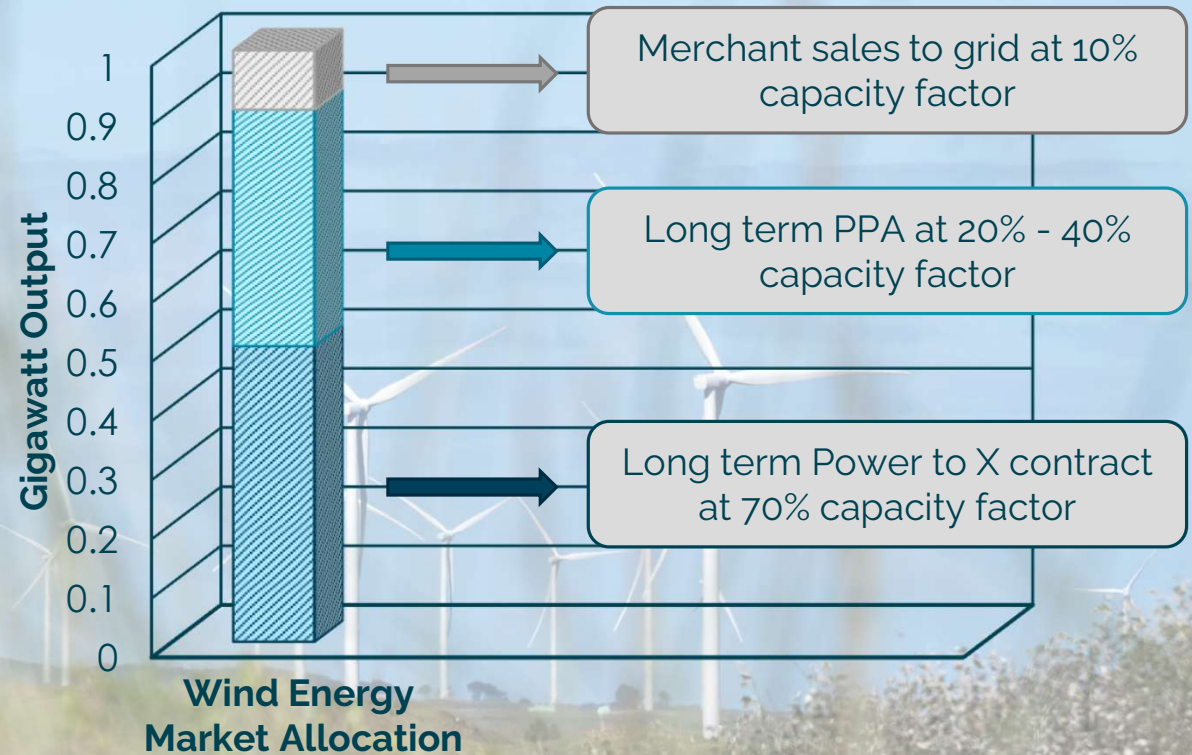
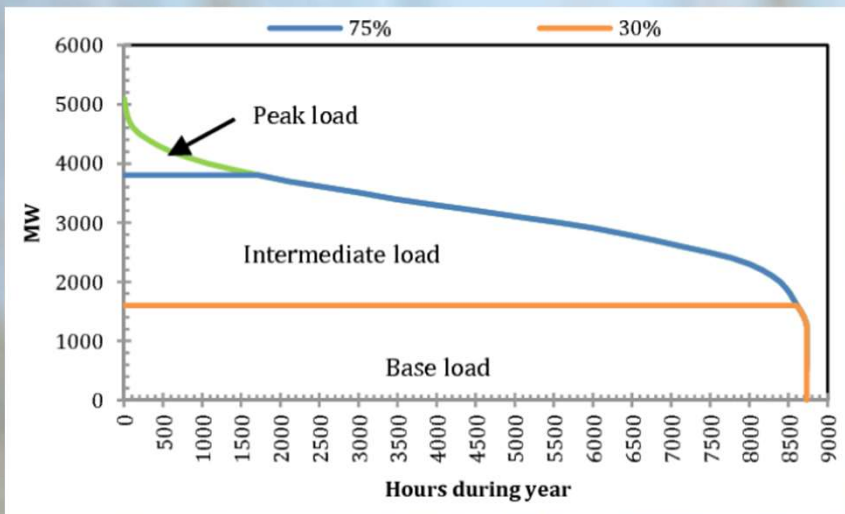
- Green fertiliser
- Chemical feedstock
- Energy storage
- Power generation
- Export
- Heat

Power to X Case Study: Early Scale, Low Cost H2 & Electricity

50:50 PARTNERSHIP WITH NEW ZEALAND'S ONLY AMMONIA PRODUCER

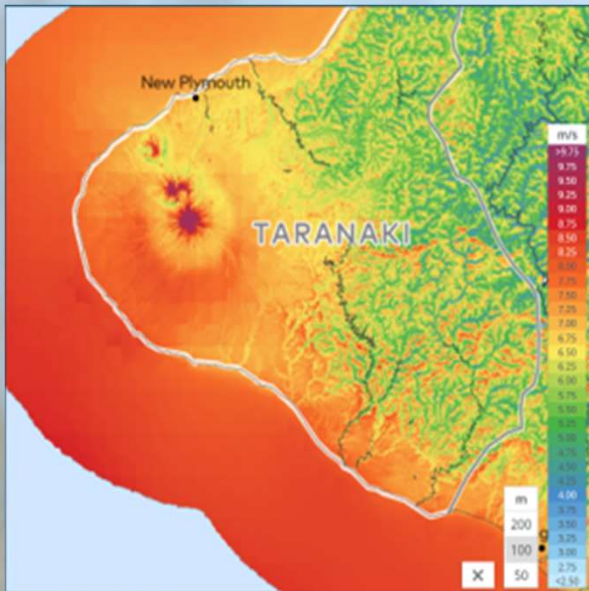


Wind Intermittency and P2X Complement each other

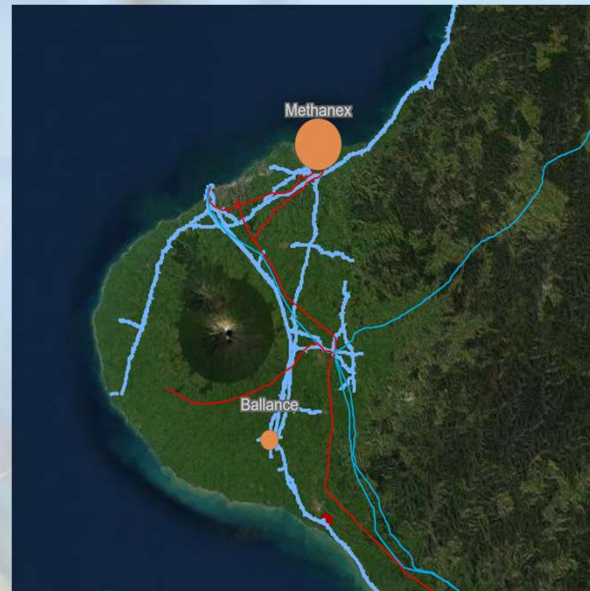


Taranaki's World Class Wind Resource a Key Enabler

POWER TO X EXPORT IN TARANAKI ENABLED BY GAS INDUSTRY EXPERTISE AND ASSET RE-UTILISATION



Regional on and off shore windspeed is amongst the fastest worldwide.



Existing Taranaki infrastructure well located to enable Power to X.

Existing Infrastructure:

Tank farms

Gas pipelines

International port

Existing Expertise:

Offshore drilling

Oil and Gas

Methanol

Ammonia



Electricity costs make up:

60-70% of the total cost of green hydrogen

40-50% of the total cost of green ammonia

Thank you

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