

ENERGY EDUCATION

Mauri mahi, mauri ora

ENERGY NEWS FROM THE REGION, COUNTRY AND WORLD | NOVEMBER 2021



WITT NEWS

WITT trains students in building EV's

Electric vehicles are fast. They are fun. They are the future.

EVOLOCITY is about fast forwarding that future. It's about stimulating innovation and growing awareness of the advantages of electric transport in a sector which may be the global growth sector of the 21st Century.

High school teams are equipped with an electric bike componentry kit. During the course of the year they design & build their own electric

vehicles. At the end of the year they bring their vehicles to a motorsport park for some fun competitions.

WITT Evolocivity Workshops

WITT ran four workshops during the year on CAD design, welding and fabrication and then the final build which included installing all the electronics, batteries and motors.

The students will develop skills and knowledge in mechanical

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Offshore Future Energy Forum

25 - 26 November 2021



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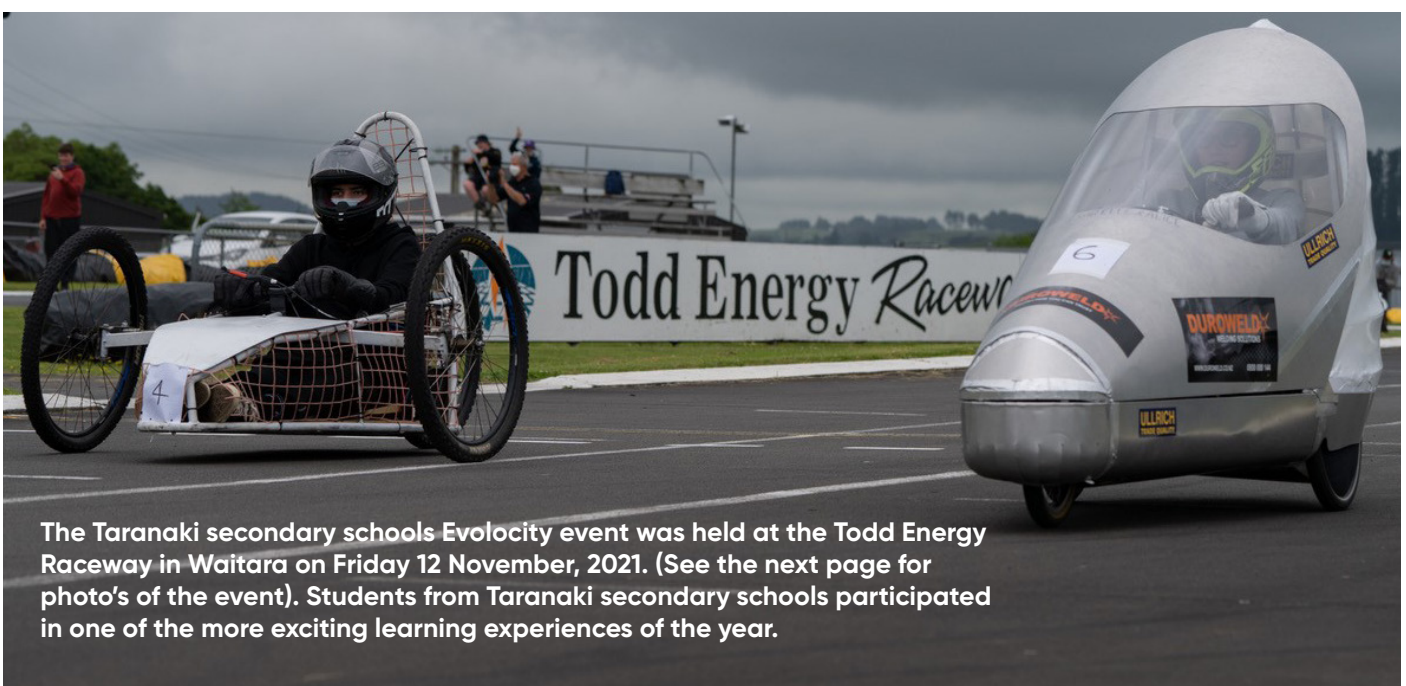
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Electric vehicles built by Taranaki teenagers.

& electrical engineering, electronics & programming, sensor and display programming, video making and marketing and tying it all together is learning the art of teamwork.

The end of year event also featured a demonstration from three students from Mount Manganui College who built their own Go-kart with a 3KW power plant that propelled their kart around the track with a top speed of 70 Kmh.



The Taranaki secondary schools Evolocity event was held at the Todd Energy Raceway in Waitara on Friday 12 November, 2021. (See the next page for photo's of the event). Students from Taranaki secondary schools participated in one of the more exciting learning experiences of the year.

Joint tertiary endeavour to support capability, outreach in renewable energy sector

A joint effort by two New Zealand tertiary institutions aims to develop capability and outreach in the renewable energy sector.

The agreement between Te Herenga Waka—Victoria University of Wellington and Te Kura Matatini o Taranaki—Western Institute of Technology at Taranaki (WITT) will support joint programmes and micro-credentials, collaboration between staff, students, and others, shared research and facilities, and secondary school outreach in the field of renewable energy.

“We are delighted to announce this joint initiative with the Western Institute of Technology in Taranaki centred on the renewable energy sector,” says Professor Dale Carnegie, Dean of Engineering at the University.

“Our institutions will collaborate to develop innovative solutions

to reduce New Zealand’s carbon emissions.”

“Alongside our iwi and industry partners, this collaboration combines our collective skills and expertise and brings together an amazing team focused on solving one of the great challenges of the coming decades.”

Te Herenga Waka Vice-Chancellor Professor Grant Guilford and WITT CEO John Snook signed a formal Memorandum of Understanding at the University in Wellington in November.

“The agreement goes a long way to support WITT’s vision to bring transitional energy education to Taranaki. We are committed to positioning Taranaki to become an education energy centre of excellence in Aotearoa, as is the vision of Minister Megan Woods,” WITT CEO John Snook says.



“Working with the University and sharing our knowledge and expertise means we can be more effective at co-creating real solutions for the challenges ahead and bringing opportunities for WITT students and the region. The MoU is a vital element in completing our next steps allowing for advanced research, teaching, and learning to take place in Taranaki and across New Zealand.”



Joining forces for Clean Energy

WITT Signs Memorandum of Understanding with Canterbury University

Two tertiary institutions are joining forces to support the transition to clean energy and improve accessibility to higher education in Taranaki.

The University of Canterbury (UC) Tumu Whakarae | Vice Chancellor Professor Cheryl de la Rey and Western Institute of Technology at Taranaki (WITT) Tumu Whakarae | Chief Executive John Snook have today signed a Memorandum of Understanding to establish a strategic partnership.

Focus on Sustainable Energy

The agreement creates opportunities for joint teaching and for students to move more easily from one institution to the other. The partnership will have a focus on sustainable energy, business studies and on supporting mana whenua tauria | Māori students.

“We believe that by working together and sharing our knowledge and expertise we can be more effective at co-creating real solutions for the challenges ahead,”

Professor De la Rey, Vice Chancellor, University of Canterbury

“Taranaki is an early adopter in the transition to clean energy, moving away from fossil fuel industries, and we are looking forward to playing a part in the region’s ambitious Tarana1ki 20250 Roadmap. This could be an example for the rest of Aotearoa to achieve carbon emission goals while providing equitable transitions and sustainable community development,” says Professor De la Rey.

The agreement brings opportunities for WITT students and the region,

says Snook.

“A key focus for WITT is to provide an Energy Centre of Excellence, where innovation and sustainability in energy can be taught to students, allowing for the dramatic workforce transition asked of Aotearoa New Zealand in the Net Zero Carbon Act.”

“The MOU with the University of Canterbury is a vital element to this challenge, as it allows for advanced research, teaching and learning to



The University of Canterbury Tumu Whakarae Vice Chancellor Professor Cheryl de la Rey

Western Institute of Technology at Taranaki (WITT) Tumu Whakarae Chief Executive John Snook

take place that benefits Taranaki and all of New Zealand.

“The Centre needs to attract full-time energy sector workers into part-time education, full-time students into WITT’s Bachelor of Engineering, and those looking for a university qualification into a first year with WITT before proceeding to the likes of the University of Canterbury”, says Snook.

The three-year agreement will encourage further co-operation in the areas of engineering and business at undergraduate and postgraduate level and will jointly develop courses that benefit the Taranaki community as the region moves away from fossil fuel industries.

Effective from semester one 2022.

The MOU comes into effect from the beginning of 2022 and comes as New Zealand joins world leaders at the 26th UN Climate Change Conference of the Parties COP26 global meeting

in Glasgow in an urgent bid to reduce carbon emissions and limit global warming to two degrees – or ideally to 1.5 degrees.

New Zealand’s target, or nationally determined contribution (NDC), to reduce net emissions by 50 per cent on 2005 levels by 2030, requires urgent and comprehensive action.

Through provision of education, WITT is responding to the needs of industry by aligning the WITT strategy ‘Te Korowai Mātauranga o Taranaki’ with the regional development priorities outlined in the Taranaki 2050 Roadmap and Tapuae Roa, the regional economic development strategy and action plan for Taranaki.

The two organisations will also continue to work closely with Ara Ake, the national new energy development centre, supporting energy innovation and innovators on their journey to decarbonising our energy systems.

Engagement at the heart

Engagement is at the heart of UC’s strategic vision 2020-2030, which commits the university to working with mana whenua and across sectors locally and nationally, for the public good. Accessible, flexible and future-focused education, and world-leading research with impact are pillars of the University’s direction, along with environmental sustainability and fostering excellence, collaboration and innovation.

Amongst other sustainability goals, UC is on track to become carbon net neutral by 2030. The University recently co-hosted the national Sustainable Development Goals (SDG) Summit Series, which helped to create a national SDG Alliance, an Aotearoa SDG Declaration and action plans for change.

[This is a joint release with the University of Canterbury](#)

WITT’s Low Emissions Energy Workshop



Dr. Ellie Khaghani
Energy Lead at WITT

WITT held the low emissions energy workshop for national vocational education on 27th October.

The workshop’s purpose was to bring together key participants and brainstorm, share visions, address potential issues, identify opportunities and discuss solutions. Moreover, for the next step, the aim is to create a working group, develop an action plan to implement key initiatives, seek the endorsement of Te Pūkenga and explore future funding opportunities.

Energy Centre of Excellence

The low emission energy workshop proposes the establishment of the Energy Centre of Excellence (COE) to address the energy sector’s significant challenges regarding the impact of energy-related emissions on the climate.

The Energy Centre of Excellence will have a significant role in driving innovation and excellence in vocational education, focusing on advanced teaching, learning, and research.

It will support the development of a high-quality curriculum and programme design through strategic partnerships.

The MOU’s with the University of Canterbury (UC) and Victoria University of Wellington (VUW) are vital elements in creating opportunities for joint teaching, and to also enable students to move more easily from one institution to the other.

The Energy Centre of Excellence will be a consortium of expert



representation from industry and the broader tertiary sector with wide-reaching benefits for Taranaki and all New Zealand.

The industry needs significant focus and innovation to solve problems and create opportunities to attract new skilled workers, and provide more training. The existing workforce also needs upskilling to transition to new technologies. The establishment of Energy COE is necessary to fill this gap by strengthening links between industry and communities.

[Continued on next page](#)

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The workshop was composed of four activities; (1) issues and opportunities, (2) products, solutions, and outputs, (3) measures of success, and (4) future contribution. Some of the themes discussed were:

- Bridging the gap in skillsets required for a rapidly changing industry due to widespread electrification and embedding automation in traditional technology.
- Building investor confidence to accelerate and develop new technologies and skillsets by strategic partnerships and resources sharing.
- Establishing a platform to support

and identify opportunities with iwi to ensure regional cohesion to avoid disaggregated activities

- Linking to regional plans to bring together key stakeholders and partners in the development of a transparent and inclusive action plan to remove any duplication
- Linking with Ara Ake to hasten New Zealand skill developments and transitions by understanding the successful global case studies, disseminating research and direct training towards new technologies considering their different levels of maturity.
- Promote pathways into the sector by increasing awareness and promoting new technologies to

encourage people into an energy career by marketing and outreach to youth

- Investigate more flexible funding and support options for students and part-time training to help individuals, companies, industries.
- Increase collaboration across low energy emission companies and promote the sharing of ideas, experience and research.

The attendees discussed the highlighted opportunities and shared their insights to brainstorm the best solutions forward. The workshop was an interdisciplinary success in hearing the voices of different stakeholders to build a brighter path to the future in transition.

INNOVATION

Fund Navigator - Ara Ake provides tool to help innovators develop their ideas.

Ara Ake, the national new energy development centre, based in New Plymouth is making it easier for innovators to succeed.

Many innovators run out of resources and don't know where to go. This problem now has a solution where innovators can access a tool to find funders who will best suit their stage in the innovation pipeline.

What the Innovators say

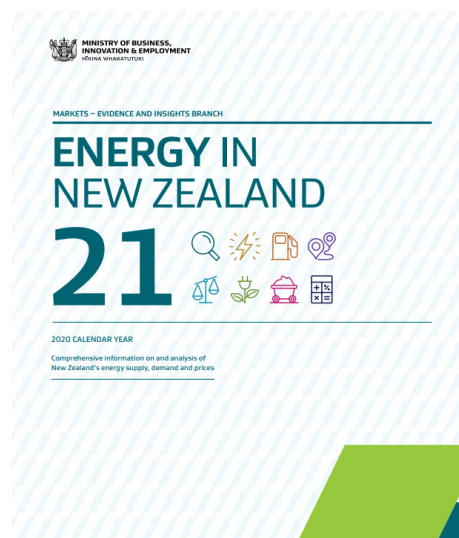
"A one-stop-shop of available resources in this area would be ideal! Even a Google search doesn't seem to return available funds ..."

"We look on the relevant websites to assess availability, or we are advised of funds through the local chamber of commerce or other individuals. In all cases we have found that funding is either not available for our stage of development or it does not apply because we are working on an unexpected technology."

Where to go

To look at the Energy Innovation Fund Navigator, click on the link below. Also, take some time while you are there to check out who Ara Ake are and what they're doing.

USEFUL LINKS



Home Funding Services & Projects Insights News & E

Energy Innovation Fund Navigator

<https://www.araake.co.nz/funding/energy-innovation-fund-navigator/>

The two-wheeler electric revolution - the new norm

This revolution combines two great discoveries of the world. The wheel and stored energy (electricity).

The electric revolution has arrived with big brand bike manufacturers creating production lines for fully-electric or hybrid motorbikes and bicycles. Conversion kits are also popular where you can convert your old bike to an electric one in just a few minutes, although they probably won't look like these.

Right: Specialized electric 'gravel bike', great for off-road trail riding with power assist 2X you.

Centre left : Yamaha Trial bike, meeting the challenge of exact control at super low speed for trials.

Centre Right: Audi's concept e-bike, will likely set you back \$20K or so, if they put it into production. And why wouldn't they?

Bottom: The Harley-Davidson Livewire goes from 0-100 Kmph in 3 seconds and sounds like a jet.



Mainstream bike, motorbike and vehicle manufactures are all building electric.

Harley Davidson Livewire

With the ignition on, you hit what would be the starter button. There's no explosion of V-twin anger, just two green bars either side of the display that let you know you're good to go. You'll notice when you're, um, idling, at the lights, there's a slight and intentional shudder that runs through the Livewire. It's just to remind you that no, you haven't stalled, and no nothing is wrong. Simply that the Livewire is ready for the green light.



Hiringa Energy launches out in its big build



Hiringa Refuelling, along with their station partners Waitomo, will soon break ground on the first of four green hydrogen refuelling stations across key freight routes in the North Island.

The first four stations in Auckland, Hamilton, Tauranga and Palmerston North will form part of a nationwide network that Hiringa Energy intends to grow to 24 by 2026. ... An investment of \$50 million is bolstering the first stage, which includes detailed engineering and compliance work already done, and is aimed at the establishment of the commercial viability of green hydrogen fuel in New Zealand.

“Creating material change at this scale is incredibly exciting. This achievement is the result of collaborating with our key partner companies and working closely with central and regional government, all of whom have the central aim of making green hydrogen refuelling for heavy transport a reality in New Zealand,” says Andrew Clennett, CE of Hiringa Energy.

The project received \$16m from the Government’s COVID-19 Recovery Fund and growth capital from key investors including Sir Stephen

Tindall’s K1W1 fund, and international investments from Asia and North America.

Twenty trucks on their way

The TR Group, the heavy commercial vehicle leasing and rental company, has ordered 20 Hyzon hydrogen fuel cell trucks for the New Zealand market.

The 600hp, 58 tonne gross combined mass (GCM) tractor units will be powered by 100% green hydrogen.

Fulton Hogan has announced it will

be among the first New Zealand adopters of Hyzon fuel cell electric trucks due to arrive in the country mid-next year.

About Hyzon

Headquartered in Rochester, NY and with operations in Europe, Singapore, Australia and China, Hyzon is a leader in hydrogen mobility. Hyzon is a differentiated, pure-play, independent mobility company with an exclusive focus on hydrogen in the commercial vehicle market.



COP26

The conference ended with more widespread “net zero” targets – such as that set in New Zealand with the 2050-focused Zero Carbon Act – bringing the global area covered by them from 30 per cent two years ago to 90 per cent today. As well, 154 countries, including New Zealand, have set new national targets, representing 80 per cent of global emissions. According to work done by independent experts Climate Action Tracker, full implementation of the fresh collective commitments could hold temperature rise to 1.8C.

Jamie Morton, NZH

<https://www.nzherald.co.nz/nz/cop26-climate-change-conference-2021-ends-so-where-did-it-get-us/JPLK2TUGMNL46RBVVA4F7WLELY/>

Wireless power trial to take place in Taranaki

Auckland-based startup Emrod will begin a field demonstration in Taranaki of its world-leading, long-range wireless power transfer technology early next year. The project has been enabled by Ara Ake, New Zealand’s national new energy development centre, and will be delivered in partnership with Powerco, New Zealand’s second-largest energy distributor. Emrod’s long-range wireless power transfer system works by converting electricity into electromagnetic waves sent directly over the air to receivers

and converted back into electricity for use by consumers. This point to point wireless electricity transfer field demonstration follows successful in-door trials of Emrod’s technology in Auckland and will see power sent wirelessly over a distance of at least 200 metres.

<https://www.araake.co.nz/news-and-events/news/emrod/>

NZ Government signs arrangement with Singapore

The signing of an Arrangement of Cooperation on low-carbon hydrogen with Singapore heralds the start of greater collaboration between it and New Zealand as both countries transition towards low carbon economies. The cooperation arrangement was signed by Minister Woods and Dr Tan See Leng, Singapore’s Second Minister for Trade and Industry. The arrangement marks the start of a journey to collaborate on the production, deployment and research into a new hydrogen economy.

<https://www.beehive.govt.nz/release/hydrogen-arrangement-signed-singapore>

Does the road ahead offer wireless EV charging?

Auckland University researchers say a road-embedded demonstration system for wirelessly charging electric vehicles while driving could be operating within three years. Auckland engineering professor Grant Covic is leading a multidisciplinary research project – supported by colleagues at Victoria University and

GNS Science – to develop a robust inductive power transfer system that can be placed in roads. IPT technology – which Covic and fellow professor John Boys developed to a commercial scale in the 1980s – makes it possible to transfer power without cables, moving the current across a magnetic field between two close points. Existing EVs are not fitted for wireless charging, but can be retrofitted with charging pads.

Energy News

<https://www.energynews.co.nz/news/electric-vehicles/111551/does-road-ahead-offer-wireless-ev-charging>

James Shaw at COP26

“Since I last addressed this gathering, New Zealand has taken some significant strides towards our zero carbon future. Last month we passed legislation requiring companies to report to shareholders on their climate related risks. We have also made it easier for people to purchase low emission vehicles. And quadrupled the amount New Zealand Green Investment Finance has available to invest in the low carbon technologies of the future. We are also ready to agree to new opportunities for increased support for Pacific countries suffering loss and damage. As we each continue the hard work of bringing emissions down in our own countries, we need to foster a just transition that leaves no country, community or person behind.”

<https://www.beehive.govt.nz/speech/new-zealands-national-statement-cop26>

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THE ENERGY INNOVATION VALUE CHAIN



The organisations below contribute to the energy innovation ecosystem in services and funding activities. There are three stages in the innovation value chain: Research & Development, Demonstration & Commercialisation, Deployment in Market, representing TRL 1-11. The position of the organisation categories indicates their breadth of activity across the value chain. (F = Funding or finances, S = Services)

Ara Ake^(S)

NZ Green Investment Finance^(F,S)

Public & Private Capital (Angel Investors, Private Equity, Venture Capital)^(F,S)

Ministry of Business, Innovation & Employment^(F)

Energy Efficiency Conservation Authority^(F,S)

Callaghan Innovation^(F,S)

NZ Trade & Enterprise^(F,S)

Accelerators and Incubators^(F,S)

Innovative Partnerships^(F,S)

NZ Universities^(F,S)

Kanoa REDIU^(F,S)

NZ Growth Capital Partners co-investment^(F,S)

Crown Research Institutes^(F,S)

Click [here](#) to access the map

Finding the Solutions - Mapping New Zealand's Energy Innovation Ecosystem

Ara Ake, the national new energy development centre based in New Plymouth, is mapping New Zealand's Energy Innovation ecosystem.

While many innovative ideas do not progress to commercially scalable products, many of the technologies that will drive the transition to clean energy are already in development.

The International Energy Agency (IEA) estimates that almost half of the emissions reductions needed by 2050 come from technologies that are already at the demonstration or prototype stage. That means many of the solutions we are looking for are

already in front of us.

Innovation can be defined as “the application of “better solutions” that meet new requirements, unarticulated needs, or existing market needs.”

“The innovation lens is central to transitioning to a low-carbon economy, as there is a “new requirement” (as per the innovation definition) for the whole economy to decrease GHG emissions.

In essence, the transition to net zero-emissions means finding sustainable ways to solve all the problems we currently solve with fossil fuels.”

Low-emission innovations which are

commercially available today have the greatest potential to reduce emissions by 2030 and beyond.

Indeed, by 2050, these technologies are projected to continue to account for the majority of emissions reductions on an annual basis. In contrast, innovations at demonstration or prototype stages can be expected to decarbonise currently hard-to-decarbonise sectors over a longer timeframe. The clear implication of this is that New Zealand's emissions reductions commitments in 2030 and 2050 will mostly have to be met by technologies which are in-use today.

Electricity Efficiency and Conservation Authority (EECA)



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