

ENERGY EDUCATION

Mauri mahi, mauri ora

ENERGY NEWS FROM THE REGION, COUNTRY AND WORLD | APRIL 2022



WITT Partners with Ara Ake and Ecolabs (Singapore) in a New Zealand testbed project (See page 2)



Singaporean Minister of State, Ms Low Yen Ling, with John Snook, CE of WITT (left) and Cristiano Marantes, CE of Ara Ake, at the launch of the project in Singapore.

ENERGY EDUCATION
Mauri mahi, mauri ora
energy@witt.ac.nz
Ph. 06 759 7065

STAY UP TO DATE
SUBSCRIBE ➤

WITT offers Solar Energy Courses in 2022

- Grid-connected Battery Storage Systems, Design & Install (Microcredential Course 1).
- Grid-connected PV Systems, Design & Install (Microcredential Course 2).
- Stand-alone Power Systems, Design & Install (Microcredential Course 3).

New solar energy training courses to help equip New Zealand for the transition into clean energy are now being offered at WITT. Targeted at qualified electricians throughout New Zealand, these 10-credit NZQA approved micro-credentials solar energy courses will be delivered in blocks (three to four days face-to-face) in New Plymouth with the remaining of the learning taking place either side of the block learning. Participants will learn from an industry expert with more than 30 years of experience as an electrician including 15 years in the installation, design and training of solar systems throughout Australia.

Send all registered enquiries to info@witt.ac.nz or phone 0800 948 869.

We will register your details and be in touch with confirmed start dates and further details.



WITT Partners with Ara Ake and Ecolabs (Singapore) in a New Zealand testbed project

New Zealand and Singapore's energy innovation partnership has been further strengthened with the announcement of an energy innovation testbed at WITT, in New Plymouth.

The project is a collaboration between the Western Institute of Technology at Taranaki, Ara Ake, and EcoLabs Centre of Innovation for Energy, Singapore.

During the same week that Prime Minister Jacinda Ardern visited Singapore, John Snook (CE of WITT) and Cristiano Marantes, (CE Ara Ake) presented to Ms Low Yen Ling, Minister of State for the Ministry of Trade and Industry (Singapore), the project about the launch of a real-world demonstration site at the Western Institute of Technology at Taranaki, (WITT), now open to energy innovators from both Aotearoa New Zealand and Singapore.

WITT is looking to transition one of its main buildings at the Bell Street campus to 100% renewable energy sources and to reduce energy

consumption by up to 50% by 2025. By attracting the best innovators from New Zealand, Singapore and beyond, WITT is one step closer to achieving these objectives. They are partnering with EcoLabs Centre of Innovation for Energy, which has successfully deployed real world testbeds across Singapore and in the Asia Pacific region.

This project will also provide the opportunity for students to get involved with the deployment of innovative energy solutions, supporting the development of the skills that will be needed in a low carbon future.

It would be great to extend this initiative to all the other tertiary education providers. And why not extend it to the wider public sector, which has a target to be carbon neutral by 2025.

Right: CE of WITT John Snook with CE of Ara Ake, Cristiano Marantes, signing the Memorandum of Understanding between WITT and Ara Ake which includes a testbed site for energy innovation.

Below: Blocks A & B, which will form the centre of the energy innovation testbed.

"This is an exciting opportunity to gain expertise from global innovators and share leading international technology to not only help WITT reach its low emissions energy aspirations, but drive innovation and the development and commercialisation of energy solutions across the nation."

John Snook, CE of WITT





What the NZ Government says about the WITT decarbonisation project.

“Accelerating the decarbonisation of our energy system, supporting our energy innovators, and driving innovation through global collaboration is a key focus of this government, especially as we continue our economic recovery from Covid-19. It’s good to see the Government funded Ara Ake helping WITT prepare for the future with this exciting project.”

Hon Dr Megan Woods, Minister of Energy and Resources

Who is Ara Ake?

Ara Ake is New Zealand’s national new energy development centre and supports energy innovators on their journey to decarbonising Aotearoa. Whether it’s by connecting innovators with funding opportunities, professional services, or insightful information, our mission is to ensure new energy solutions prosper for the betterment of all.

Who are Ecolabs?

Enterprise Singapore, Nanyang Technological University (NTU), and the Sustainable Energy Association of Singapore (SEAS) jointly established EcoLabs-COI in 2019.

Enterprise Singapore, overseen by the Ministry of Trade and Industry, funds NTU to host and run EcoLabs-COI. EcoLabs-COI.

EcoLabs-COI provides innovators with access to facilities and connections that can help technology developers to explore commercial opportunities. This includes access to R&D experts, lab infrastructure, test bed sites and business opportunities to help them successfully commercialise and scale up their technologies. To date it has focused on electrification, energy efficiency and digitalisation. In addition, in line with evolving government priorities and national strengths, EcoLabs-COI’s focus has expanded to include urban mobility, renewable integration, smart grids, CCUS and topics related to the so-called circular economy.

- The EcoLabs Centre of Innovation for Energy (EcoLabs-COI) focuses on collaborations that can help energy technology developers to explore commercial opportunities, and has established an international network of accessible test beds in companies around the world.
- It includes support for business development and has developed in-house expertise to pair advisers with recipients.
- It has an international approach to finding markets for start-ups and working with overseas government agencies to partner with their equivalent programmes.

Offshore Wind – the next big thing for Taranaki?

The NZ Super Fund is investigating a potential one gigawatt offshore wind farm in the South Taranaki Bight.

The Government-owned pension fund is partnering with Danish energy infrastructure giant Copenhagen Infrastructure Partners on a project they believe could be generating by the end of the decade – subject to two year’s feasibility work.

An initial 1GW development would represent over 11 per cent of New Zealand’s current electricity demand capacity and could power over 650,000 homes. The partners believe the project could later expand to 2GW, helping to meet strong projected growth in demand for electricity in New Zealand. This project will be CIP’s first investment in New Zealand and follows the NZ Super Fund’s \$NZ 208 million commitment to CIP’s new Energy Transition Fund (CI ETF I) last year.

CIP and NZ Super Fund are in the early stages of project feasibility evaluation, which includes wind resource measurement, designing detailed environmental impact assessments with the support of local communities and experts, and



examining industry potential and training needs for the Taranaki region.

Transferable skills?

The pie-chart below prepared by the AusIndustry Cooperative Research Centre, shows that between the hydrocarbon sector and the offshore wind sector, there is a 28 percent good skills overlap, a 36 percent some skills overlap and a 36 percent partial,

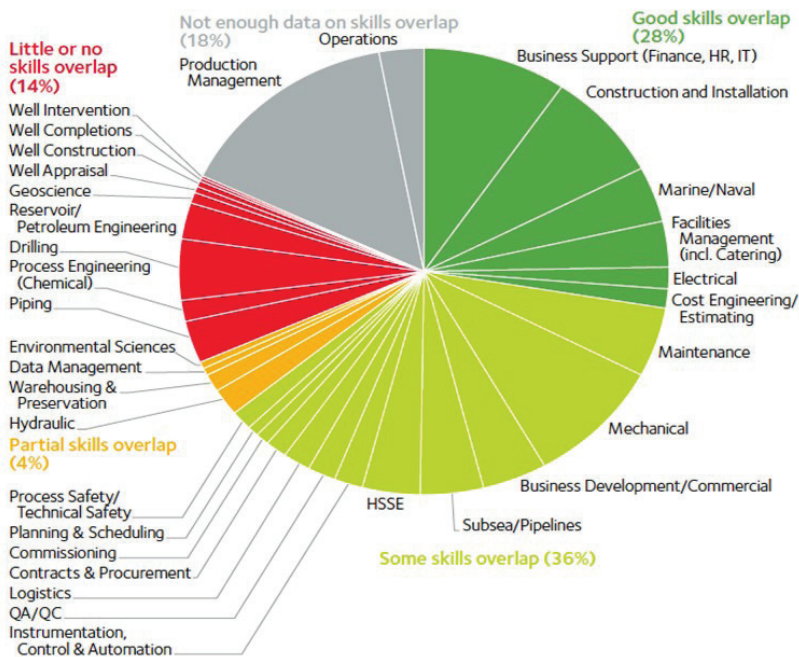
little or no skills overlap. This research tells us that more than 70 percent of those working in the oil and gas sector will need further retraining to enable them to work in the offshore wind sector.

Oil & Gas companies in transition

One of the largest oil and gas company in the world is Norway’s Equinor, 69 percent owned by the Norwegian government. This is the company, who with their engineering and offshore marine experience, designed and pioneered floating offshore wind turbines. It is a great example of a company that is embracing the energy transition. Their 2021 Sustainability report says “In 2021, we made significant strategic progress and changed our organisation to accelerate our transition. By 2050, our ambition is to be a net-zero company, including emissions from the use of our products.”

Change is here and companies will be transitioning, as will their people and WITT is here to assist.

WITT is committed to training the workforce for the future energy needs for New Zealand.



WITT is offering courses in renewable energy.

Email info@witt.ac.nz or call 0800 948 869



Unlock an exciting future!

Students can start a career in exciting fields like Cyber Security Engineering and Artificial Intelligence at WITT thanks to the new WITT-Victoria University of Wellington partnership.

The agreement between Te Herenga Waka—Victoria University of Wellington and Te Kura Matatini o Taranaki—Western Institute of Technology at Taranaki (WITT) supports joint programmes including a Bachelor of Engineering (BEng) and a Bachelor of Science (BSc) with students studying their first year at WITT and seamlessly moving to Victoria University to specialise and complete their degree.

In addition to the personal appeal of staying in Taranaki, students study in the renewable energy capital of New Zealand and have access to supportive tutors and a modern lab for simulated practicals.

“We’re pleased to offer an Engineering pathway at WITT that leads to exciting careers in Software Engineering, Cyber Security Engineering or Electrical and Electronic Engineering,” says John Snook, CE of WITT.

Ākonga can also study towards a career in in Computer Science, Computer Graphics and Games or Artificial Intelligence at WITT by completing the first year of their three year BSc at WITT and the following two years at Victoria University of Wellington.

Email info@witt.ac.nz for further information.

“The flexibility of being able to stay in Taranaki to complete your first year then pathway to Victoria will be very attractive to our community,”

John Snook, WITT Chief Executive



Joint BEng (Hons) Programme

First year WITT, years 2-4 Victoria

- Software Engineering
- Cyber Security Engineering
- Electrical and Electronic Engineering

Joint BSc Programme

First year WITT, years 2-3 Victoria

- Computer Science
- Computer Graphics
- Games or Artificial Intelligence

Exciting careers on offer
with WITT-Victoria
University Partnership

Dave Hudson : From lithium mines to Infrastructure Park Project Manager

Infrastructure Senior Project Manager/Lead, Dave Hudson has joined the WITT whānau to manage the new \$1m Infrastructure Skills Park in Bell Block.

The park, funded by New Plymouth District Council (NPDC), aims to help address the skills and capability gap within the civil construction sector by providing a simulated work-site for ākonga to hone their civil infrastructure work skills.

The council said the long-term financial benefit of the WITT-run park would help reduce construction costs and improve work quality around the region. Alongside positioning Taranaki to become a “training centre of excellence in the central North Island for civil construction workers.”

“Having the Infrastructure Park in Taranaki will bring the benefits right here into our backyard,” says Hudson.

Dave brings countless years of experience to the Infrastructure



Park project, starting as an apprentice carpenter training in heavy commercial and residential construction sectors to spending 25 years in Australia, where his career moved him through a number of roles.

“I spent most of my time in Western Australia where career moves lead me from a tradesman to leadership roles, from supervisor up to project management roles. I was lucky enough to have worked and built iron ore and lithium mine sites in the

remote goldfield and Pilbara regions,” he says.

When Dave isn't at work you'll find him enjoying any one of his numerous hobbies including; fishing, art, harmonica playing, triathlon training or surfing.

Dave is excited to get the park underway and see students taking advantage of the facility.

“I'm ready to see the park succeed, grow and evolve both in practice and reputation.”

For Dave, or Huddy as he doesn't mind being called, the WITT Kia Maia catchphrase says it all and dictates how he is tackling his new job as the Infrastructure Project Manager.

‘Kia Maia – Be your best’ is so important whether you are learning or teaching or even just making your way through life.

Find out more about WITT's Infrastructure Courses [here](#).



Here comes hydrogen!

Hiringa to build out hydrogen refuelling network

The Prime Minister was recently joined by the head of Toyota NZ, Neeraj Lala, in Tokyo, where he announced the launch of an innovative hydrogen-powered car-sharing scheme in Auckland. The scheme will feature the Toyota Mirai which uses zero emission fuel cell technology.

“Hydrogen powered-vehicles are one way we can reduce the emissions of our car fleet,” says the Prime Minister.

“New Zealand’s hydrogen-powered fleet will only grow, and hydrogen vehicles of all sizes need infrastructure to support them.

The Government is already supporting the roll-out of a series of refuelling stations to be used by heavy freight hydrogen trucks through \$20 million

from the Covid-19 recovery fund.

These hydrogen-refuelling stations will begin to appear in the North Island later this year, built by New Zealand company Hiringa, together with Japanese partner Mitsui & Co.

Hydrogen car-sharing comes to New Zealand

A car-sharing scheme using a fleet of fuel-cell electric vehicles (FCEVs) is about to start. Toyota NZ has teamed up with eight businesses for the Hydrogen Project, which starts on May 1 in Auckland. The marque’s partners in the trial are The Warehouse, Air NZ, Saatchi & Saatchi, TVNZ, Beca, Westpac NZ, Spark and Z Energy.

A fleet of Mirai FCEVs will be at the centre of the scheme and for many Kiwis it will be the first time they have seen the model on our roads.



Energy Innovation Fund Navigator



Click [here](#) to access Ara Ake’s Energy Innovation Fund Navigator

www.araake.co.nz

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT

MARKETS - EVIDENCE AND INSIGHTS BRANCH

ENERGY IN NEW ZEALAND

21



2020 CALENDAR YEAR

Comprehensive information on and analysis of New Zealand’s energy supply, demand and prices



WITT is part of Te Pūkenga - New Zealand Institute of Skills and Technology, together with all the other polytechnics in New Zealand. From 2023, all WITT learners will be enrolled with Te Pūkenga.



Polymer batteries a step closer - Flinders University

An international research team has moved closer to developing a more sustainable, rechargeable 'organic' battery model by doubling its energy storage capability. With the aim to one day power small electronic devices and divert toxic waste from landfill, researchers at Flinders University with Chinese collaborators have used a catalysis strategy to produce two-electron storage in organic radical batteries, or 'ORBs' - a big advance in improving their storage capability.

The emerging rechargeable battery technology uses more environmentally friendly materials than current metal-based batteries. ORBs can be made from sustainable organic compounds to reduce reliance on lithium and cobalt mining. These rare materials are usually not recycled in modern batteries and end up in landfill.

Fuseworks

Emissions Reduction Plan coming out in May.

Minister of Climate Change James Shaw says the latest report from the Intergovernmental Panel on Climate Change (IPCC) is clear: we need a plan now to cut our emissions.

The report notes that 83 per cent of net growth in greenhouse gases since 2010 has occurred in Asia and the Pacific - and that New Zealand, Australia and Japan, as a group, had some of the highest rates of GHG emissions per capita in 2019.

"The latest insights from the IPCC are clear and the case for action couldn't be any stronger or more urgent," James Shaw said.

"As a country that relies on our environment for so much, addressing climate change isn't a nice to have, it's essential."

The Emissions Reduction Plan, which will be published next month, will set out how New Zealand will reduce

emissions across every sector of the economy.

The IPCC report - which focuses on the prevention of further warming - says both domestic action and international co-operation are essential if we are to reduce emissions and prevent a catastrophic increase in global temperature.

The challenge ahead may feel daunting, but the report also highlights a number of effective and innovative ways we can lower emissions and limit the effects of climate change.

The Beehive

"As a country that relies on our environment for so much, addressing climate change isn't a nice to have, it's essential."

Hon James Shaw, Minister of Climate Change

STILL TIME TO ENROL
Courses start 25 July 2022
Phone 0800 948 869

Thought about a career where you can design, build and manufacture **the future?**



Click here for further information



An ocean-sized challenge

Our oceans are vast, but they're also bustling, with 50,000 cargo ships moving 11 billion tonnes of goods every year. You could power New York City for 60 years on those annual energy needs, and virtually all of it involves high-carbon fossil fuels. For now, shipping accounts for three per cent of global emissions, but the problem is that it's set to grow even as we decarbonise elsewhere – by 2050, shipping could be responsible for 17 per cent, according to a 2015 report for the European Parliament. Unfortunately, a bit like one of those massive oil tankers, the industry is proving slow to turn around.

The 2015 Paris Agreement left the job of curbing plane and ship emissions to their respective industry regulators. In shipping's case, the International Maritime Organisation (IMO) has said carbon intensity needs to be cut by 40 per cent by 2030 and 70 per cent by 2050 compared with 2008 levels. Some have decried that as lacking ambition, but it will still be fiendishly complex and expensive.

A report by Shell and Deloitte titled 'All Hands on Deck' cites such challenges as: a lack of global regulation; the fact that shipping assets have 20-to 40-year lifespans; electric vessels, while seen as viable for inland or short sea routes, aren't an option for deep-sea shipping, which accounts for the bulk of emissions; the alternatives to existing fuels cost more, have lower energy density and require more storage capacity, and currently aren't produced at scale.

Danish shipping giant Maersk, which has committed to a 60 per cent reduction in CO2 emissions by 2030 compared with 2008 levels, has evaluated biodiesel, methanol, lignin fuels and ammonia as fuel options. It intends to launch a world-first carbon neutral liner vessel by 2023; has ordered eight large container vessels to operate on green methanol; has invested in one Californian startup making green biomethanol from waste and another that produces electrofuels from direct air capture of CO2; and has launched a carbon-neutral shipping option called Maersk ECO Delivery that uses biodiesel.

In this country, Ports of Auckland has set a target of being emissions free by 2040. In the short to medium term, that involves replacing conventional diesel with renewable diesel as a transition fuel (it has been successfully tested in a pilot boat and tug as well as shore-based uses such as forklifts). Longer term, The Port is looking seriously at green hydrogen, produced and stored onsite, as a power source for heavy machinery that operates around the clock, and has partnered with Japan's Obayashi Corp to build a hydrogen facility. As well, it is about to take possession of 'Sparky', the world's first full-scale, electric shiphandling tug.

<https://www.genesisenergy.co.nz/about/climate-hub/content/climate-hub/turning-the-tide-on-shipping>

Six amazing facts about solar

1 – Every hour almost 100,000 solar panels are installed worldwide.

According to the World Economic Forum, the demand for solar panel installations is booming. Solar power companies install 1000 football fields worth of solar panels every day worldwide.

2 – Air pollution is holding solar power back.

Solar energy production works better in areas with low pollution levels. The reasons are obvious, fewer pollutants in the atmosphere makes it easier for the sun's rays to penetrate through to the earth. As we move to renewable energy, the air should become cleaner. And this will make solar power generation easier. Solar panels will absorb more sunlight and produce more energy. It becomes a domino effect.

As we move to solar and other renewables, they become more efficient thanks to the cleaner atmosphere. The results are more savings and higher output from your solar installation.

3 – We could power the entire earth on solar.

An area the size of Spain covered in solar panels would generate enough power to satisfy the world's energy

needs. That would remove the need for all other forms of renewable and non-renewable energy sources. Spain is a big country, but it doesn't even account for 1% of the earth's landmass.

But we need not pick one single location. Think about all rooftops, wasted spaces, and desert areas we could use for panels. This is a reality we might soon be experiencing.

4 – Solar panels are virtually pollution-free.

Manufacturing of Solar PV creates some environmental pollution, of course. Until we can 3-D print panels in space using space matter as materials, we'll need to use the earth's resources to build panels. However, once built and installed there is a negligible impact on the environment from solar panels.

No moving parts, no noise pollution, no emissions, and no need for fuel besides the sun's rays.

5 – Contaminated or unsafe water can be converted to drinking water with solar power.


They call the system Solar Water Disinfection (SoDis). This form of water purification only works with biologically (bacteria, virus) contaminated water and not water contaminated with industrial pollutants or chemicals. Further treatment steps are not needed. And the process does not pollute the environment. The potential for cleaning water in rural areas is huge.

6 – The largest battery ever built is solar powered.

The world's largest battery, built by Elon Musk, CEO of Tesla, is located in Australia. The battery's capacity is 100MW and Tesla built the entire unit in 100 days. The battery can power 30,000 homes for an hour.

Rumours of Tesla plans to build "The world's biggest battery" in the UK using up to a million solar panels, have been reported in the press. But Tesla denies the rumours, for now. However, someone is putting plans in place to build a new solar battery in Kent that will be three times as big as the Australian solar battery.

<https://wanakasolar.com/knowledge-hub-posts/6-amazing-solar-energy-facts-you-probably-didnt-know/>



Study engineering and link your career to energy, structures, manufacturing, buildings, machinery, roads, products and more.

Study options include:

Bachelor of Engineering Technology (Mechanical/Civil, Level 7)

The Bachelor of Engineering Technology (BEngTech) is a three-year engineering degree, where students develop the capability to analyse and implement solutions to real-life, practical situations. It teaches students to understand and apply engineering science knowledge and provides a pathway into engineering, construction and related manufacturing industries. Students choose to major in Civil or Mechanical engineering. Graduates meet an industry demand for people who can actively apply engineering knowledge and integrate that knowledge into high level practical situations.

Job prospects for civil engineers

www.careers.govt.nz/jobs-database

Earn \$60K-\$70K a year

Engineering technicians/draughtspeople with one to four years' experience usually earn \$50K-\$70K per year. Senior civil engineers usually earn \$120K-\$180K per year.

Good job opportunities

Chances of getting a job as a civil engineer are good due to a shortage of workers.

Enrolment	info@witt.ac.nz
Fees	\$7,120 (Full time domestic) \$885 (per paper domestic)
Start date	25 July 2022

Introduction to Engineering Maths (Level 3)

Build your mathematic skills and knowledge in an engineering context. This training scheme provides a pathway for students to meet the entry criteria for the NZ Diploma in Engineering.

Enrolment	info@witt.ac.nz
Fees	Fees free
Start date	25 July 2022

Graduate Diploma in Engineering (Highways, Level 7)

This programme is designed to give those that have engineering qualifications a chance to gain technical knowledge in highway engineering and general knowledge of applied management. The goal is to provide the technical and management skills to function at middle management level.

Enrolment	info@witt.ac.nz
Fees	\$6,784 (Fulltime domestic) \$843 (per paper domestic)
Start date	25 July 2022

NZ Diploma in Engineering (Mechanical/Civil, Level 6)

This internationally recognised diploma gives students the knowledge and skills required of an engineering technician. You'll learn to apply theoretical and technical knowledge to practical situations and demonstrate the necessary strategies to work safely and effectively with contractors, communities, clients and authorities. Pathways include progressing to Bachelor of Engineering Technology.

Job prospects for engineering technicians

www.careers.govt.nz/jobs-database

Earn \$50K-\$70K a year

Engineering technicians/draughtspeople with one to four years' experience usually earn \$50K-\$70K per year.

Good job opportunities

Chances of getting a job as an engineering technician/draughtsperson are good due to a shortage of workers.

Enrolment	info@witt.ac.nz
Fees	TTAF Funded until 31 Dec 2022
Start date	25 July 2022

WITT's extensive range of qualifications includes more than 60 options with study pathways that include postgraduate study and bachelor's degrees through to diplomas, certificates and Micro-credentials that can be completed part-time or full-time.

Click [here](#) for further information