

Energy Education

Mauri mahi, mauri ora



Investing in Taranaki's changing future

Our purpose. Te Pūkenga provides excellent and quality education opportunities that support learners, employers and communities to gain the skills, knowledge, and capabilities Aotearoa needs now and for the future. Learners and their whānau are at the centre of all we do.

Featuring:

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Positive futures for WITT's young women in energy.

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EVelocity builds underway.

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Ara Ake team up with SolarZero and 11,000 household solar consumers to make a virtual power plant.



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A Centre of Excellence in Energy & Engineering will:

- Support the growth of excellent vocational education with a focus on teaching, learning and research.
- Support the development and sharing of high-quality curriculum and programme design.
- Be a consortium with expert representation from industry, the wider sector, and a range of other areas, for example iwi and vocational education representatives.
- Have a national focus.
- Be hosted by a regional campus of Te Pūkenga.
- Address issues and opportunities with a significant strategic impact, ideally with wide-reaching benefits across the sector.
- Solve real problems and grasp viable opportunities.

Stay up to date

Subscribe to our newsletter

Contact: energy@witt.ac.nz
06 759 7065



Nau mai haere mai ki Te Pūkenga Welcome to Te Pūkenga

From 1 January 2023, all WITT learners will be part of Te Pūkenga.

Te Pūkenga is building a national network of integrated learning in Aotearoa New Zealand that better meets the needs of learners, their whanau, employers and the community.

By bringing together on-the-job, on campus and online learning, Te Pūkenga is creating a network that gives learners more choices and flexibility in what, where and how they learn.

tepukenga.ac.nz



WITT Te Pūkenga

Our mission and values

As the local hub of learning in Taranaki, WITT is here to serve our community. Our role is to cater to the needs of our learners, to play our part in addressing national skills shortages, to keep talented people in the region, and to provide our key industries and local businesses the skilled workforce that they need.

We are guided by WITT's Strategy, Te Korowai Mātauranga o Taranaki, and our 'why':

We connect people to their future

From degrees and diplomas to certificates and short courses, WITT delivers industry-relevant training to people at all stages of the learning journey. Through provision of education, we respond to the needs of industry and align with the regional development priorities outlined in the Taranaki 2050 Roadmap and Tapuae Roa.

WITT programmes include foundation levels 1 to 3 through to Bachelor's Degrees, Graduate Diplomas and Post Graduate qualifications at Level 9. We deliver through four academic schools and align with the needs of the region and skills shortages across the country:

- School of Māori Enterprise, Business and Information Technology
- School of Nursing, Health and Wellness
- School of Trade Training, Primary and Creative Industries
- School of NZIHT, New Zealand School, Engineering, Energy and Infrastructure.

A focus on collaboration with industry, schools, and local iwi keeps us relevant and connected to the needs of our community. Building new partnerships, nurturing existing relationships and strengthening our links with the region are all priorities as we move into our changing future.

Investing in your the future

Becoming the better you at WITT Te Pūkenga

Welcome to another issue of Energy Education News.

The sharpest tool you can bring to any task is skill and determination. Here at WITT Te Pūkenga we believe that to build a great future starts when we sharpen our knowledge, our skill, our self-belief and our determination to put it into action

"If I had five minutes to chop down a tree, I'd spend the first three sharpening my axe."

Abraham Lincoln

Lincoln sharpened his axe for three minutes, leaving only two to do the hard mahi. You need both sharpness and determination.

At WITT Te Pūkenga, our objective is to be a global high-quality vocational applied and on-the-job learning organisation. We want to build knowledge and skill into our ākonga (students).

We serve not only our ākonga (students), but we also work hard for our communities employers, so they can recruit and develop skilled, productive employees who will work with determination to succeed.

Taranaki, like no other, is facing rapid economic, social and technological change, as it moves to a low emission economy. With the global trend of energy industries moving away from fossil fuels and moving towards

renewables, in particular solar and wind; that is not a straight forward step for Taranaki's energy companies and workforce.

Te Pūkenga is very mindful that lifelong learning is a critical part of a persons successful career aspirations. Lifelong learning can improve people's resilience and offer employment security as they become an adaptable and ever learning valued member of any team. Employment security gives people many more options and reduces inequity in our communities.

Aotearoa New Zealand is a place of creativity where people can thrive and prosper when they have the right tools in their hands, and know how to use them.

WITT Te Pūkenga's work is to place those tools in their hands and offer support to our ākonga (students) so they learn skills and progress in their lives with esteem and confidence.

Oprah Winfrey, one of the world's most influential women, put it this way. "We can't become what we need to be, by remaining what we are."

The only person you are destined to become is the person you decide to be, so join us here at WITT Te Pūkenga, believe in yourself and become the better you.



Thanks Dad!

Summer Price



Thanks to her Dad's suggestion, Spotswood College graduate Summer Price is training for a career in the energy industry with the Certificate in Process Operations (Level 3).

She's loving the mix of classroom theory and hands-on learning thanks to industry placements. She is currently enjoying work experience at Methanex and will be placed at Beach Energy next. While Summer is one of the youngest in the class, she is finding the learning straightforward and her class and workmates accepting and supportive.

Having a Dad in the industry has shown Summer she too can have a rewarding career in energy.



Hands-on experience-based learning brings success

Mikayla Mathys

Bachelor of Engineering Technology ākonga Mikayla Mathys remembers only too well what it is like to make decisions about what to study and where to study.

As she finished off her final year at New Plymouth Girls High School, she was set on following her interest in STEM (science, technology, engineering and mathematics) subjects and heading away to university.

"I was set on getting a bachelor's degree, which wasn't on offer at WITT at the time," she says.

Mid-way through her second year, she returned home once a bachelor's degree was available at WITT Te Pūkenga.

"I realised I love being here in Taranaki, and the more hands-on, experienced-based learning in a polytech really suits me," she says.

She says she likes tutors knowing her by name and appreciates the small class sizes and their industry connections.

Staying local has led to two summer internships with First Gas. In her first year, she had a role in 3D scanning First Gas assets, and last summer had a water bath heater project that she's been able to carry through as her final year Engineering Development Project.

First Gas host a number of engineering and technology students on a comprehensive 12-week programme each year where they get a taste for the industry and are assigned a real-world project as a focal point for their time, says First Gas Engineering Services Manager Tim Gray.

"We want to make sure they get to work on something they can see and



touch that isn't too theoretical, and they are often projects we want to get to but fall outside our team's day-to-day work," he says.

"We put time and effort into recruiting the best candidates for our internships from polytechs and universities, and Mikayla's been a standout," he adds.

Mikayla is also the recipient of two scholarships, the GNS Te Pū Ao scholarship and the Ara Ake scholarship for BEngTech students.

The Ara Ake scholarship is awarded to WITT students who are well connected to their community and will use their learnings to make a difference. As part of the scholarships, Mikayla has opportunities to be exposed to the work that both Ara Ake and GNS do, which adds to her industry knowledge.

In the future, Mikayla hopes to turn her passion for the energy sector into work and feels she has a head start thanks to her local internships and the connections she's made through

An exciting future

A joint programme between WITT Te Pūkenga and Victoria University unlocks new pathways

WITT Te Pūkenga is pleased to be partnering with Te Herenga Waka, Victoria University Wellington (VUW) to create opportunities for rangatahi to stay in Taranaki and study then pathway to an exciting degree programme at Victoria University.

Study the first year of your engineering degree at WITT Te Pūkenga, then pathway to Victoria University.

- Joint BEng (Hons) Programme
- Joint BSc Programme



Scholarships

WITT Te Pūkenga has scholarships available to study full-time engineering in New Plymouth, either at diploma or degree level and welcomes enquiries regarding these.

If a student has a preference to focus on computer software, engineering and associated fields, then WITT Te Pūkenga can now help you on that journey and better prepare you for life at university.

These scholarships are proudly sponsored by Ara Ake and GNS.



WITT EVelocity build programme going strong

Workshops on CAD, welding and manufacturing alongside mentor and teacher guidance, have empowered students to bring their designs to life. There's so much value in the journey, encompassing real-world learning experiences that shape our rangatahi in profound ways – their way of thinking, self-belief, and dreams for the future, together with material skills.

Taranaki Regional Finals
Sunday 22 October, 10am-4pm
KartSport Taranaki (Waitara)



Two-wheeled tech - the fastest motorbikes in the world

New Zealander Burt Munro rode this highly modified motorcycle on his final speed run at Bonneville Salt Flats, Utah, United States. On this run, Munro set the land speed record of 296 km/h for a motorcycle under 1000 cc, a record that remains unbroken for that class of motorcycle.



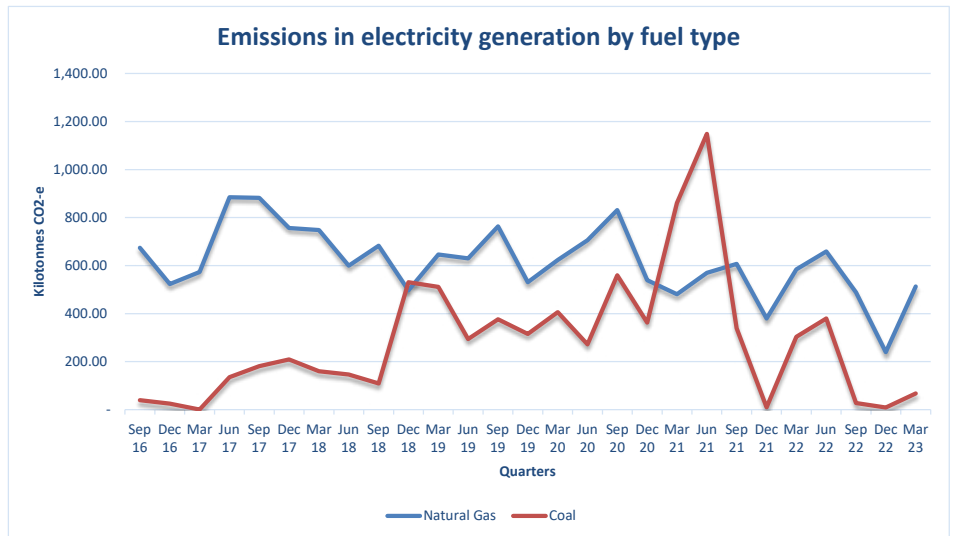
The Voxan Wattman was designed for speed and has achieved that goal, as it's now the fastest fully electric motorbike in the world. The superbike can reach a top speed of 456 km/h—much faster than the second-place competitor Lightning LS-218 which can do 0-100 km/h in 2.2 seconds! In October 2020, the Voxan Wattman (a new high-performance version), ridden by Max Biaggi, reached a top speed of 456 km/h (283 mph), making it the fastest electric motorcycle ever.



New Zealand Energy Quarterly report (Q1, 2023)

Main highlights for this quarter are that the renewables share of electricity generation is up, while both coal-based generation and natural gas based generation are both down.

- The renewable share of electricity generation for the quarter was 87.5%. This was the highest March quarter renewable share since 1996.
- Hydro generation was 7.4% higher than in the March 2022 quarter, largely due to high rainfall in the North Island including the Auckland anniversary weekend floods and Cyclone Gabrielle. This is despite lower than usual inflows at several South Island hydro catchments.
- Coal-based generation was down 61.1% and gas-based generation was down 17.1% when compared to the previous March quarter. Coal imports also fell 73% over the same period.
- Industrial electricity consumption was down 4.1% from the March quarter 2022. This was led by a drop in wood production due to the disruptions and repairs following Cyclone Gabrielle. Overall electricity consumption was down 1% over this time.



Emissions by fuel type

New Zealand’s energy emissions are dominated by liquid fuels. These account for over half of all energy sector emissions, and have been steadily increasing since 1990. Gas and coal make up most of the remainder, with biomass and fugitive emissions contributing only a small percentage of total energy sector emissions.

Emissions by sector

New Zealand’s energy emissions are dominated by three main sectors — national transport, manufacturing industries, and electricity generation. Emissions from national transport

account for the largest share of total energy sector emissions.

Emissions from manufacturing have grown in recent years. The level can vary significantly depending on the level of methanol production, which has historically been a large source of emissions.

Electricity generation emissions have increased significantly since 1990, although there are large annual variations within this sector. These reflect the cost and availability of hydro generation, which New Zealand relies heavily on.

<https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/new-zealand-energy-sector-greenhouse-gas-emissions/>



A virtual power plant pilot set up by Ara Ake and SolarZero to help support winter energy demand.



Ara Ake, New Zealand's future energy development centre, headquartered in New Plymouth, recently announced a major, collaborative pilot with solarZero in which Kiwis with solar and battery systems will contribute to the reliability of electricity supply for New Zealand, unlocking residential demand flexibility at an unprecedented scale.

The world-leading pilot integrates approximately 11,000 individual homes with state-of-the-art Virtual Power Plant (VPP) technology to help manage winter peak demand.

The result adds up to 30MW (roughly the same amount of power consumed by 30,000 homes) to put back into the grid. solarZero's batteries take just two hours to fully charge.

The pilot will be the first to utilise real-time pricing changes introduced by the Electricity Authority in April this year that enable sector participants to bid and offer their demand flexibility and 'distributed energy resources' into the wholesale market with more certainty.

"This is one of the most innovative, and globally significant, projects seen in the electricity industry in recent times. We're entering a new era of energy in which households are active enablers of a smarter, greener and

cheaper power system," says Matt Ward, Chief Executive of solarZero.

The pilot between Ara Ake and solarZero will:

- Demonstrate how energy generated and stored by residential solar and battery systems can participate within the electricity market to provide additional capacity where there is a potential electricity supply shortfall.
- Build greater understanding within the energy industry of the capabilities required to facilitate a secure electricity supply into the future.
- Provide evidence to inform opportunities to evolve the

electricity market by utilising distributed energy resources to manage peak demand.

- Provide insight into the role that households could play in balancing supply and demand, while potentially saving consumers money on electricity bills.

A virtual power plant (VPP) is a network of individual energy resources, such as solar panels and batteries located in different places, that generate, store, distribute and manage power collectively and share the benefits. Globally VPPs are being used in communities like Brooklyn/Queens in New York, Washington DC, California, Australia and Singapore.



15 minutes for a full charge!

One of the world's fastest EV chargers, ABB's Terra 360, is set to shake up the New Zealand industry as its highly anticipated launch approaches.

The new charger has a maximum output of 360kW and has been designed specifically to charge both passenger and commercial vehicle fleets. It is capable of fully charging any electric car in 15 minutes or less.

It will be officially unveiled at the NZ Energy Excellence Awards taking place in Christchurch on August 30. A fullscale launch will follow at the Electro Mobility Summit in Auckland at The Cloud venue on September 5.

The Terra 360 is a modular charger which can simultaneously charge two vehicles with dynamic power distribution, optimising the charging speeds for each outlet.

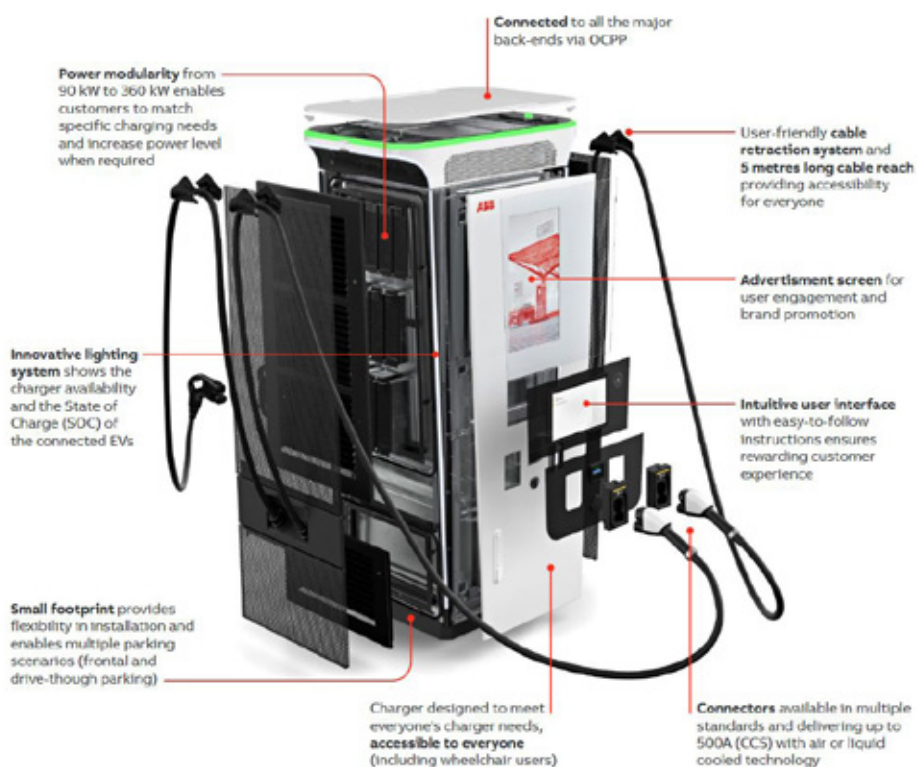
This means that drivers will not have to wait if somebody else is already charging ahead of them. They simply pull up to another plug.

The charger is set to meet the needs of a variety of EV users, whether they need a fast charge or to top their battery up while grocery shopping. Terra 360 chargers can also be installed on an organisation's commercial premises to charge electric fleet cars, vans and trucks. Time to charge always depends on a number of factors such as battery size, charging state, current and voltage limits.

In broad terms, for a small truck or van, the charging speeds can be similar to that of many SUVs on the market, so about the time it takes to have a short break and grab a cup of coffee. It can add 100km in less than three minutes, bringing more charging power to urban locations, and helps keeps customers and fleets on the move.

The Terra 360 supports the major charging standards, CCS-1 and CCS-2. "Designed around the needs of today's EV drivers, it is powerful, flexible, userfriendly and designed for accessibility," ABB says.

The Terra 360 all-in-one high-power charger At a glance



"The Terra 360 offers ultimate versatility with various parking configurations, whether frontal parking or drive-through and easy customisation. "This makes it ideal for supporting commercial fleets, retail spaces and refueling stations. Its compact footprint also makes it a perfect fit for kerbside charging and small urban spaces," the company says.

"The brand new design makes it more ergonomic and modern. With its eye-catching design and intuitive user interface, the Terra 360 provides the end user an exceptional charging experience," it adds. It has a long cable reach that serves all EV models with a user-friendly retractable cable system and is easily accessible for wheelchair users. It provides a simple and intuitive user interface, along with LED lighting indicating availability of charger and charging status. A large LCD screen for advertising and entertainment is available plus easy branding and colour customisation.

ABB says the Terra 360 is set to play a big role in helping charging network operators deploy fast-charging stations and accelerate the transition to future mobility.

Duncan Baker, ABB's vice president of marketing and sales smart power and smart buildings divisions, says the company's global scale means it's well positioned to meet growing demand in the e-mobility sector.

"As a global leader in EV charging infrastructure, ABB E-mobility has sold more than one million EV chargers across more than 85 markets. "The Terra 360 is capable of charging all kind of vehicles extremely fast, this coupled with the highly user friendly features in the screen and cable system means that the technology provides the seamless charging user experience every EV driver needs," Baker says.

IEA report: global manufacturing capacity is expanding rapidly for solar, wind, batteries, electrolyzers, heat pumps

The IEA has recently released its global update on recent progress in key regions, focussing on five technologies – solar PV, wind, batteries, electrolyzers and heat pumps – critical to the energy transition.

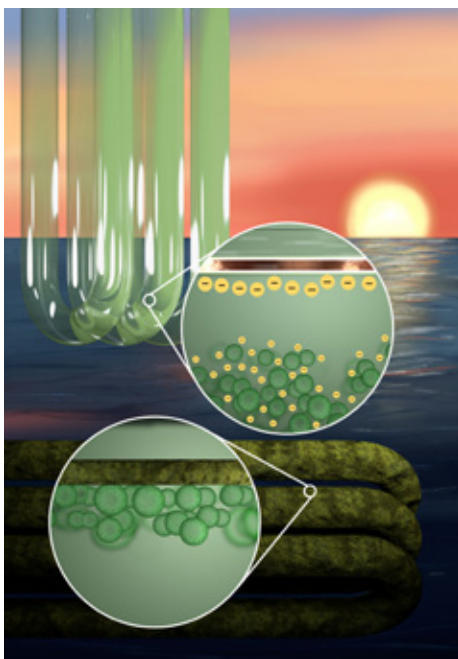
It should be read to keep decision makers informed of investment trends and the impact of industrial strategies. Overall, manufacturing capacity for these technologies is expanding rapidly, with solar PV on track to meet its 2030 targets for a net-zero world and batteries not far behind. The short lead times in ramping up production mean wind, electrolyzers and heat pumps can close their gaps quickly, provided they are given all the right support. The briefing covers announced projects, actual manufacturing capacity growth, geographical concentration, regional supply and demand, supply chains, and more.

<https://energypost.eu/iea-report-global-manufacturing-capacity-is-expanding-rapidly-for-solar-wind-batteries-electrolyzers-heat-pumps>

Farming Algae for Carbon Capture: new research cuts “fouling.” Scale-up in three years?

Natural marine algae already account for 50% of global CO₂ removal. Farming it at scale in artificial tanks or tubes would take up a fraction of the land footprint of terrestrial plants. And algae can grow up to 50 times more quickly than land-based plants. It could be a game-changer that brings carbon capture costs down and make it a commercial reality.

David Chandler at MIT explains how new research there can make farming algae much more efficient and easily scalable. Until now, the problem has always been the build-up of the algae on the tank and tube surfaces, halving the output over time. New research shows how electrostatic repulsion is used to keep the algae off the surface. The solution is simple and inexpensive. What's more, the algae can itself be turned into useful food and biofuel products, giving it an additional revenue stream that rapidly commercialises the process.



Further development is needed for scale-up but the timeframe could be as low as three years, say the researchers. It could be a significant innovation as most major scenarios say “negative emissions” must become an essential part of decarbonisation for us to meet our net-zero targets.

<https://energypost.eu/farming-algae-for-carbon-capture-new-research-cuts-fouling-scale-up-in-3-years/>

Steve Holliday, CE of National Grid: “The idea of large power stations for baseload is outdated”

Steve Holliday, CE of National Grid, the company that operates the gas and power transmission networks in the UK and in the northeastern US, believes the idea of large coal-fired or nuclear power stations to be used for baseload power is “outdated”.

“From a consumer’s point of view, the solar on the rooftop is going to be the baseload. Centralised power stations will be increasingly used to provide peak demand”, he says, The chief of National Grid also notes that energy markets “are clearly moving towards much more distributed production and towards microgrids”.

“This industry is going through a tremendous transformation. We used to have a pretty good idea of what future needs would be. We would build assets that would last decades and that would be sure to cover those needs. That world has ended. Our strategy is now centred around agility and flexibility, based on our inability to predict or prescribe what our

customers are going to want.”

<https://energypost.eu/interview-steve-holliday-ceo-national-grid-idea-large-power-stations-baseload-power-outdated/>

IEA : The world set to add as much renewable power in the next 5 years as it did in the past 20

Renewable capacity expansion in the next five years will be much faster than what was expected just a year ago. Over 2022-2027, renewables are seen growing by almost 2 400 GW in our main forecast, equal to the entire installed power capacity of China today. That's an 85% acceleration from the previous five years, and almost 30% higher than what was forecast in last year's report, making it our largest ever upward revision.

Renewables are set to account for over 90% of global electricity capacity expansion over the forecast period. The upward revision is mainly driven by China, the European Union, the United States and India, which are all implementing existing policies and regulatory and market reforms, while also introducing new ones more quickly than expected in reaction to the energy crisis.

<https://energypost.eu/interview-steve-holliday-ceo-national-grid-idea-large-power-stations-baseload-power-outdated/>

Adding ordinary baking soda to concrete production can cut 15% of its CO₂ emissions

Concrete production makes up 8% of global CO₂ emissions. Half comes from the fossil energy used to make it (which, hopefully, can transition to clean power), and the other half comes from the CO₂ that escapes during the chemical transformation. David Chandler at MIT describes research there that shows how simply adding sodium bicarbonate (yes, the baking soda you put in your cookies) during the early stages of production can remove, by mineralisation, up to 15% of the total amount of CO₂ associated with cement production. An added benefit is that the resulting concrete sets much more quickly, and doubles the mechanical performance of the early-stage concrete. Of course, the long-term performance of the new mix still needs testing. But this opens the door to a simple and low-cost way to transition to low-carbon concrete quickly and globally.

<https://energypost.eu/adding-ordinary-baking-soda-to-concrete-production-can-cut-15-of-its-co2-emissions/>

Cleaner freight deliveries as DHL launches new GoGreen Plus service

DHL Aviation, the in-house airline of DHL Express, is launching a new GoGreen Plus service that allows customers to reduce the carbon emissions associated with their air cargo shipments using Sustainable Aviation Fuel (SAF).

From June 2023, air cargo customers of DHL globally can choose the GoGreen Plus service for their shipments, with customers being given the chance to tailor the CO₂e reduction they want to achieve and the amount of SAF they use.

The GoGreen Plus service is now an option for New Zealand-based customers.

Travis Cobb, executive vice president, global network operations & aviation, DHL Express, said: "Our greatest goal is achieving net-zero emissions by 2050. Using SAF is currently key to reducing carbon emissions in aviation and our GoGreen Plus service is made possible following our collaborations with bp and Neste to supply SAF to DHL Express hubs around the world."

Ingrid Raj, senior vice president, global head aviation Commercial, DHL Express, added: "Insetting through GoGreen Plus allows customers to bring down their Scope 3 emissions, the indirect greenhouse gas

emissions that occur in a company's value chain, including downstream transportation and distribution.

"With the introduction of GoGreen Plus, we empower our air cargo customers to make more sustainable choices and embolden their contribution to reducing carbon emissions."

DHL Aviation manages 18 own and partner airlines with more than 300 dedicated aircraft fulfilling over 2,400 daily flights to more than 500 airports worldwide. Most of the freight capacity is used for DHL Express' main product TDI.

If any cargo space remains on these flights, DHL Express sells it to customers in the airfreight sector.

The GoGreen Plus service for air cargo customers will be launched at the Air Cargo Europe trade show in Munich. It follows the earlier successful launch of GoGreen Plus for Express courier shipments.

The GoGreen Plus service is part of Deutsche Post DHL Group's sustainability goal of achieving net-zero emissions by 2050. It contributes to the interim target of using 30% SAF for all air transport by 2030.

In line with its Sustainability Roadmap, Deutsche Post DHL Group aims

to offer a green alternative for all products and services across all divisions.

SAF is produced from waste oils and can provide greenhouse gas emission reductions of up to 80% over its lifecycle compared with the conventional jet fuel it replaces. The sustainability goals also include electrifying 60% of last-mile vehicles with clean pick-up and delivery by 2030 and implementing carbon-neutral designs for all new buildings.

<https://www.aircargonews.net/policy/environment/dhl-express-airline-launches-saf-service-to-cut-shipment-emissions/>

New Zealand base

Currently in New Zealand, three electric vehicles have been deployed and the two new Service Centres opened in Auckland and Hamilton in 2022, were designed with sustainability in mind. Both new facilities are equipped with daylight harvesting technology to save on energy costs associated with lighting. The Hamilton facility is also integrated with rainwater harvesting systems for collecting, storing, and using rainwater plant irrigation and vehicle washing.

https://transporttalk.co.nz/wp-content/uploads/2023/05/transporttalk_may23-1.pdf



Global Wind Energy Council - 2023 report

Highlights of their report are:

Globally, 77.6 GW of new wind power capacity was connected to power grids in 2022, bringing total installed wind capacity to 906 GW¹, a growth of 9% compared with 2021.

The world's top five markets for new installations in 2022 were China, USA, Brazil, Germany and Sweden.

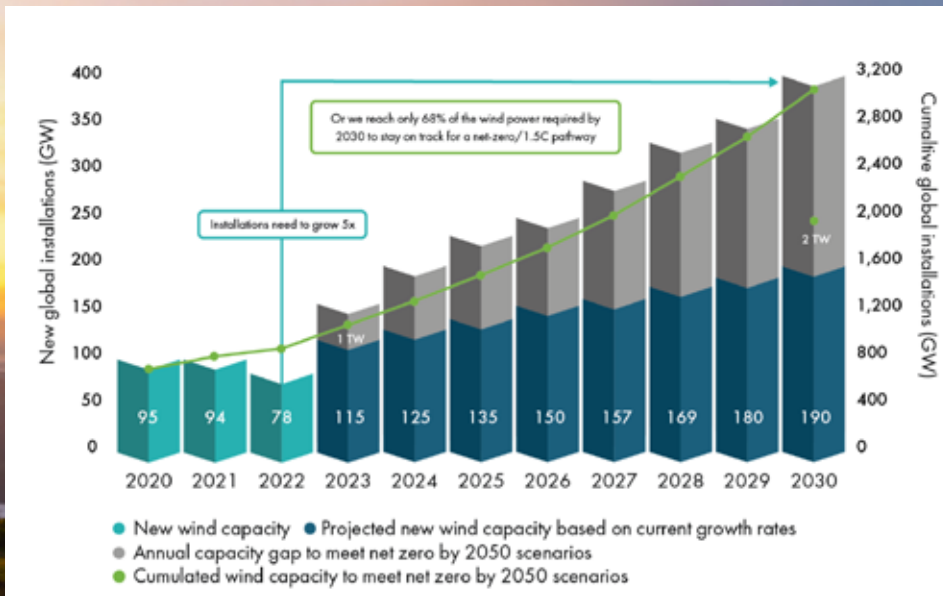
Altogether, they made up 71% of global installations last year, collectively 3.7% lower than 2021. This was primarily due to the world's two largest markets, China and the US, losing a combined 5% market share compared with the previous year – the second consecutive year that both countries have lost market share.

The 2 TW milestone is expected to be achieved in just seven years

Compared with the 2030 global outlook released alongside last year's Global Wind Report, GWEC Market Intelligence has increased its forecast for total wind power capacity additions for 2023–2030 by 143 GW (13% YoY). The main reasons behind this upgrade include:

- Energy system reform in Europe, replacing fossil fuels with renewables to achieve energy security in the aftermath of Russia's invasion of Ukraine;
- China's commitment to further expand the role of renewables in its energy mix;
- An anticipated ten-year installation uplift in the US, driven by the passage of the Inflation Reduction Act (IRA) which contains \$500 billion in new spending and tax breaks that aim to boost clean energy, reduce healthcare costs, and increase tax revenues.

<https://gwec.net/globalwindreport2023/>



The blueprint of a new industrial age

A CleanTech future

“The energy world is at the dawn of a new industrial age – the age of clean energy technology manufacturing – that is creating major new markets and millions of jobs but also raising new risks, prompting countries across the globe to devise industrial strategies to secure their place in the new global energy economy.”

This is what an International Energy Agency report has said.

It says that the global market for key mass-manufactured clean energy technologies will be worth around NZD one trillion a year by 2030 – more than three times today's level – if countries worldwide fully implement their announced energy and climate pledges.

This transition is so compelling that it is being called Industry 4.0 to represent the fourth revolution that has occurred in manufacturing.

From the first industrial revolution (mechanization through water and

steam power) to the mass production and assembly lines using electricity in the second, the fourth industrial revolution will take what was started in the third with the adoption of computers and automation, and be characterised by a fusion of technologies that is blurring the lines between the physical, digital and cyber-physical.

Industry 4.0 is the convergence of a range of technologies including the internet of things, robotics, artificial intelligence, augmented and virtual reality, 3D printing and digital twins.

What does Industry 4.0 look like in practice?

The Internet of Things: monitoring and control for increased efficiency

Recent advances in sensing and communication technologies enable you to better understand your production and manufacturing processes. You can identify process bottle-necks and implement predictive and preventative maintenance. Sensors can provide you live updates on your production

process as well as identifying when tools are becoming worn or require maintenance.

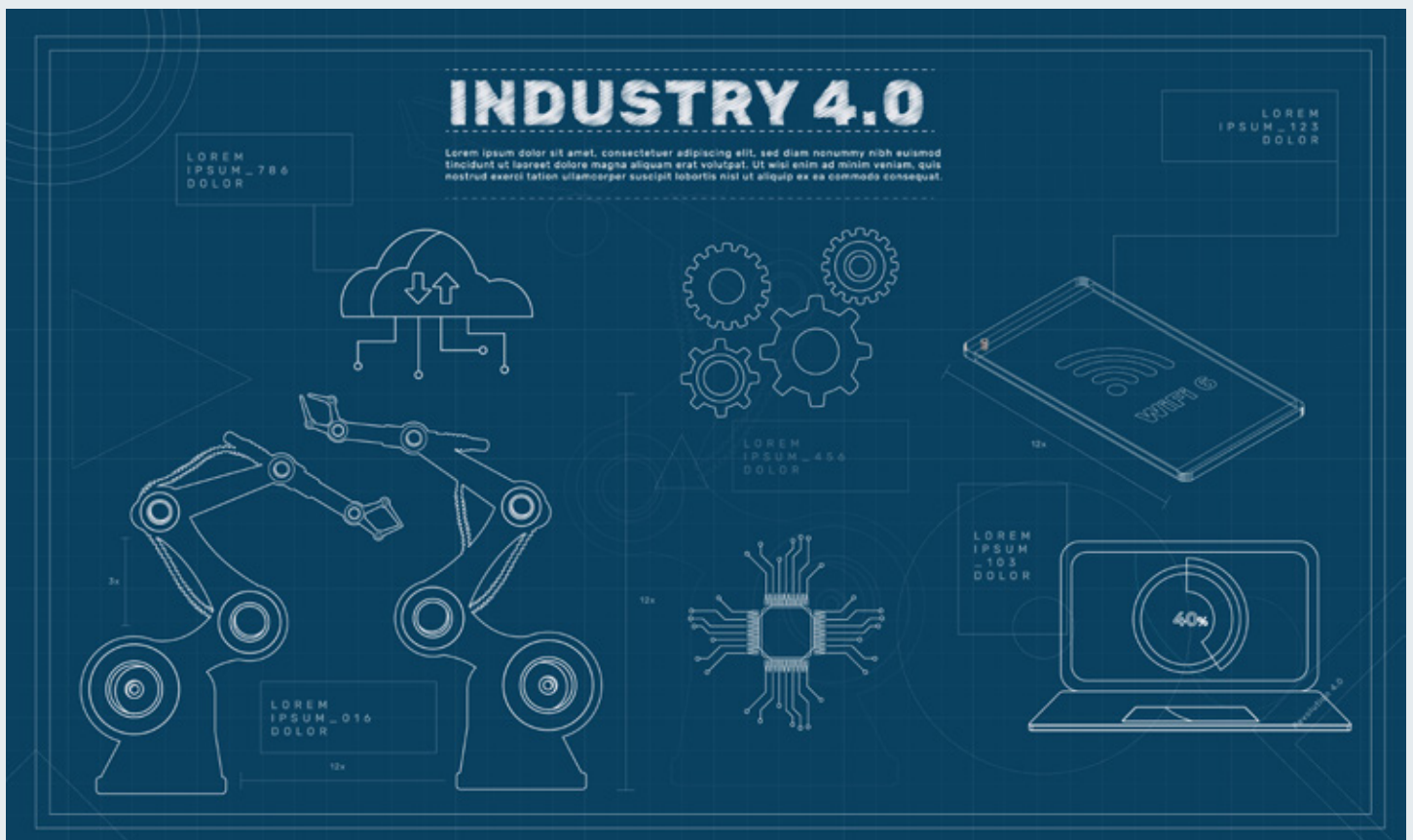
Digital twin: modelling your product and processes

Using the data collected by sensors and building a computer model of your product or process will allow you to create a Digital Twin. This will give you real-time status updates on your product and processes, as well as going through ‘what-if?’ scenarios, without putting your assets at risk.

Robots and automation: increased efficiency and precision, reduced health & safety risks

Modern production systems are increasingly automated. However you can also retrofit automation to existing and older machinery to improve performance. Integration of assistive robots, e.g. to perform repetitive and dangerous tasks, delivers further benefits.

Sources:
www.iea.com
www.callaghaninnovation.govt.nz/industry-4





Discover our renewable energy courses

Get accredited at the WITT Te Pūkenga Infrastructure Training Park in New Plymouth

Stand Alone Power Systems: Design and Installation

Domestic: \$1,200 International: \$3,500

The course Stand Alone Power Systems: Design and Installation is ideal for busy tradespeople who want to learn about designing and installing reliable off-grid power systems.

The course covers topics such as site assessment, energy yield calculation, battery technologies, system design and installation, commissioning, and fault-finding.

Grid-connected Battery Storage Systems: Design and Installation

Domestic: \$600 International: \$1,750

This course is designed for electrical workers who want to learn how to design and install safe and effective grid-connected battery storage systems, with a focus on those integrated with grid-connected photovoltaic systems.

Topics covered include battery chemistries and characteristics, battery charging, system design and yield calculations, and hazards associated with batteries and grid-connected battery storage systems.

Assessment

- Pre-course online learning (100 hours),
- Three-day in-person course (24 hours)
- Post-course assignment (16 hours).

Who should attend?

- Electricians
- Electrical Engineers
- Electrical Inspectors

All applicants must be registered electrical workers and hold a current practicing licence.

Our presenter

Tim Francis is a trainer for PV training courses at WITT Te Pūkenga, NZIHT, and is supported by SEANZ.

He has 26 years of experience as an electrician, with a background in industrial control systems and renewable energy as a designer/installer.

Tim holds advanced diplomas in Electrical Engineering (Control) and Renewable Energy, and CEC Accreditation as a designer and installer for both grid-connected PV and stand-alone power systems with both micro-hydro and small wind endorsements.

witt.ac.nz/nziht/solar-energy-training/

N.B. Completion of Grid-Connected PV Systems: Design and Installation is a prerequisite for both courses. Courses run subject to numbers.

